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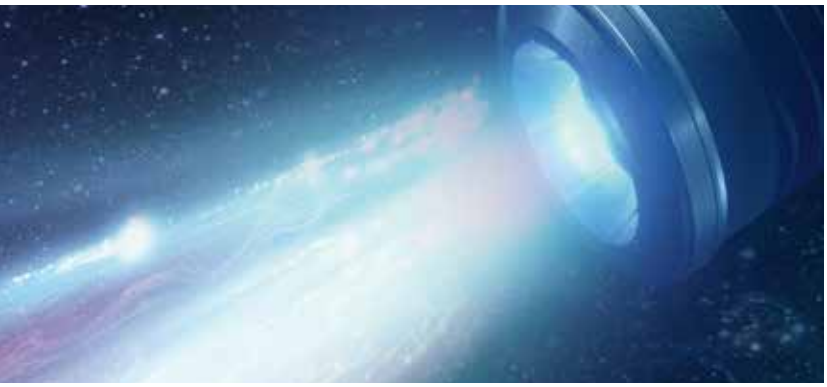
EDI Journal

European Journal for Dental Implantologists



TOPIC

Quo vadis, implantology?

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European Association of Dental Implantologists

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Strong during the crisis

Dear colleagues,

The year 2020 is coming to an end. As we feared, the coronavirus SARS-CoV-2 continues to keep us on our toes. The second wave and the economic consequences of the partial lockdown are giving us a hard time in Europe and worldwide. Hopes are now placed on two messenger ribonucleic acid (mRNA) vaccines from Germany and the United States. The European Medicines Agency (EMA) has launched an accelerated regulatory approval process for both. Optimists expect an approval in December. The EU Commission has already secured more than 400 million units of the vaccine. But even if the approval is granted in December, it will take time for the vaccines to reach the areas where they are needed.

The EU Commission is concluding large-scale contracts with vaccine producers. In mid November, the fifth contract with a pharmaceutical company–the European vaccine manufacturer CureVac–was authorized. That provides for the initial purchase of another 225 million vaccine units on behalf of all EU member states as well as an option to order another 180 million units. The delivery is expected to follow as soon as a proven safe and effective vaccine against COVID-19 is made available.

There are contracts with five pharmaceutical companies that produce vaccines. With this diversified vaccine portfolio, the Commission wants to ensure that Europe is well prepared to carry out the vaccinations once they have proven to be safe and effective. Member states also have the possibility to donate the vaccine to low and middle-income countries or to distribute it to other European countries.

And what about the dental office? For many of us it is important to convince patients to come to the dental office even during these times. After all, there is no standstill for diseases in the oral cavity. Caries, periodontitis, periimplantitis do not take a break. This is the message that BDIZ EDI conveys. Dentists can guarantee hygiene and infection protection!

We at BDIZ EDI have already informed and supported our members in March – shortly after the WHO has declared the pandemic – in all questions which are relevant for dental offices. We have managed to organize 18 online seminars in a very short time – initially only in German. In this issue, we are asking you which further online training you need in your countries. Advanced training on digital implantology, augmentation surgery, periimplantitis, short and angulated implants, ceramics? The BDIZ EDI provides top-class speakers and a reputable implantological advanced training. Take benefit of our offer and give us feedback.

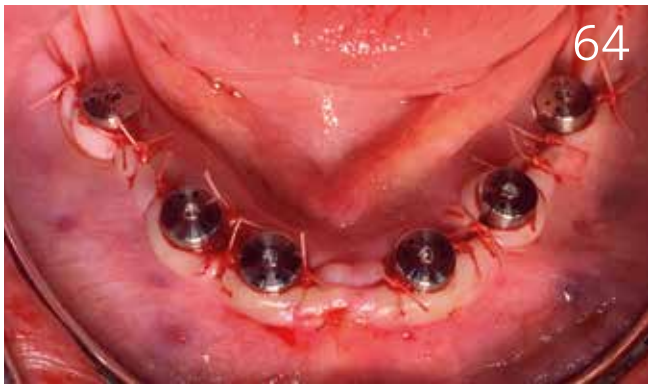
We will continue the further education program – also due to the fact that we have received nothing but positive feedback for the qualitative implementation of our online seminars. Of course, we will continue to provide face-to-face seminars. It is not certain that the 16th Expert Symposium on Ceramics can be held in February. But even if it is not possible due to corona reasons, we will find a solution.

The BDIZ EDI has proven its potential with the 61st Bavarian Dentists' Day in October in Munich. As a cooperation partner, we supported and hosted the program in four halls. Here, again, it was evident that the board of directors work together! I cannot deny it: I am very proud to be a member of a board of directors team that has proved what it is made of – especially during the crisis.

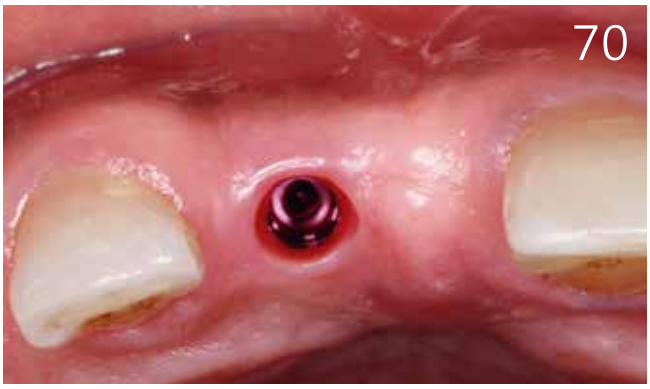
Dear colleagues, I wish you a peaceful Christmas and a good beginning to a hopefully better year 2021. I am already looking forward to meeting you again at one of our face-to-face events. Stay healthy!

Best wishes,

Christian Berger
President



Healing abutments screwed onto the implants and sutures applied in order to bring the flaps together allowing soft tissue stability



Removal of the healing abutment and one-time rupture of the mucosal attachment. The implant neck is visible deep in the gingival tissue.

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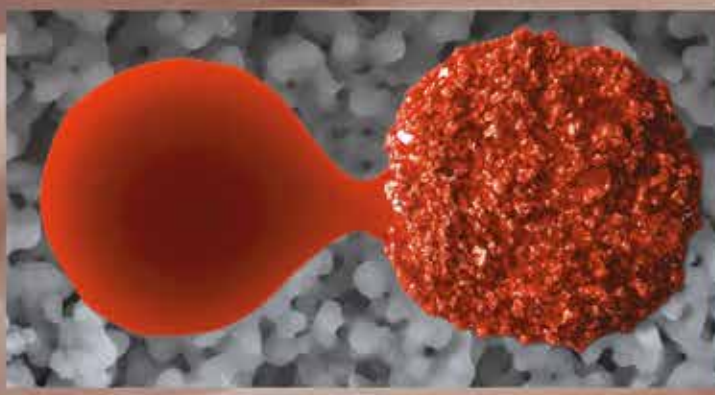

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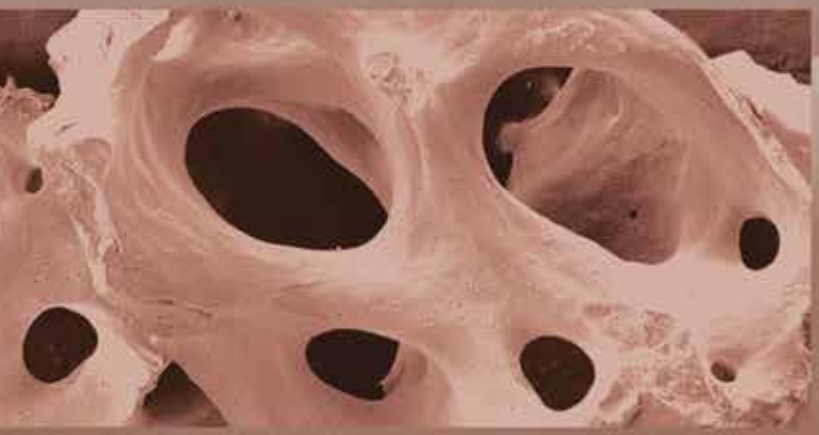

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[1] Semper-Hogg, W, Kraft, S, Stiller, S et al. Analytical and experimental position stability of the abutment in different dental implant systems with a conical implant–abutment connection Clin Oral Invest (2013) 17: 1017
[2] Semper Hogg W, Zulauf K, Mehrhof J, Nelson K. The influence of torque tightening on the position stability of the abutment in conical implant-abutment connections. Int J Prosthodont 2015;28:538-41

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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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Save the date: 16th Expert Symposium in Cologne

Ceramic materials in oral implantology

Since 2006, the BDIZ EDI has been organizing its expert symposia under the direction of Professor Joachim E. Zöller in Cologne. Each expert symposium is preceded by a European Consensus Conference (EuCC), which issues a practice guide as a recommendation for the practitioner. 2021 will be the second time that ceramics as a material in implantology will be the topic. The date will be 14 February 2021.

For the 16th time now, the BDIZ EDI is inviting dentists working in the field of implantology and those who supply implants to the Expert Symposium in Cologne. In recent years, ceramic materials – and thus ceramic implants – have had a small triumph in dental practices. The field of application of modern dental ceramics in implantology ranges from high-quality metal replacements in implantology to tooth-colored high-performance ceramics for crown-bridge prosthetics.

In the consensus paper (Practice Guide) of 2007, the then EuCC determined that ceramic implants are "offered today as one-piece transgingival implants with integrated abutment" due to the material properties; the possibilities of surface structuring with ceramic compared to titanium were currently limited; implant design and the surface structure thus required a clinical procedure adapted to these properties. The assessment from 2007 said: "A better evaluation of ceramic implants compared to titanium implants is currently neither clinically nor biologically verifiable (evidence-based medicine, level 5).

Even today, ceramic implants are not completely uncontroversial. Experts agree that ceramics is fully justified as a material and provides an innovation push in implantology. However, opinions differ in everyday treatment. Critics lack long-term studies on the ceramic materials used today.

In 2018, EDI Journal dedicated an instalment of its new section PROS & CONS to ceramic implants. Proponents argue that the high-tech material zirconia used today has nothing in common with the ceramic materials of more than ten years ago. On the one hand, the peri-implantitis risk for periodontally preloaded patients is considered to be higher when a titanium implant is used. Furthermore, the fatigue strength of ceramics is higher than that of titanium. Opponents vocally note that the benefits of ceramic implants still have to be demonstrated in clinical studies in the future. In their opinion, patients should be informed that this implant material lacks long-term evidence. Therefore, routine procedures currently still tend to favour titanium implants, not least for safety considerations.

This is an exciting topic that the BDIZ EDI will address at the 16th Experts Symposium in February 2021. Save the date!

AWU

Please note:

Alas, the congress date is subject to change on account of the COVID-19 pandemic. Read the most current updates on the BDIZ EDI website: www.bdizedi.org.

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Corona pandemic and the dental practice

What's going on in Europe?

BDIZ EDI – the European Association of Dental Implantologists – is "active in Europe" (which is one of the master slogans of the association). This is of course true in these difficult times, when dental practices across Europe–indeed worldwide–are experiencing a decline in the number of patients. We have asked for information in several countries.

The respondents answered two questions about the situation. The statements are based on the time frame end of October to mid November 2020.

1. What is the situation based on COVID-19 pandemic in your country?
2. How do dental offices get along with the pandemic situation?

Hungary

Professor Katalin Nagy, DDS, Ph.D, DSc.
Head of Oral Surgery, Faculty of Dentistry
University of Szeged
President of the Hungarian Dental Association

1 Unfortunately, I cannot give you a very positive answer, due to the very serious second wave of COVID-19 in our country.
Months ago, in March, we had about 100 new cases daily. Now, at the end of October we had (e.g. on 27 October 2020) 3200 new cases, consequently more deaths as well. We do not really have any restriction, the only one is, that in shops or malls you need to wear a mask. This is probably due to the fact that Government does not want an economical break-down.

2 We don't really have any special restrictions for dentistry. Obviously we realize that much less patients are visiting our practices than usual, which will lead in the long run to a worsening of the oral health and also a much more difficult financial situation of our dental teams.

United Kingdom

Dr Eimear O'Connell, BDS
Principal Dentist,
Bite Dentistry in Edinburgh/Scotland
President ADI UK

1 This COVID-19 pandemic has caused a complete disruption to life as we know it here in the UK.

2 For the first three months starting 23 March, all dental practices in the UK were completely closed down. The UK government said they had set up nationwide centres for patients to still access care but the service was patchy and hadn't been very well through, given they knew that they were going to stop patients receiving dental care.
That situation continued and there were increasing numbers of stories in the media about the numerous patients suffering agonising toothache. Some patients even resorted to extracting their own teeth.
In July, dentistry was restarted. The financial situation for all private practices was dire as they received little or no financial support and as result a new organisation to represent these dentists was formed – the British Association of Private Dentistry. NHS practices received 80% of their normal NHS turnover from the government. Due to shortages of PPE and rising costs of providing care due to having to have a fallow period after Aerosol generating procedures, the situation for NHS dentistry looking forward appears very uncertain.
Dentistry has suffered a severe setback in our country and there is much division between all of the various interests of the differing groups.
Due to difficulty accessing NHS care, it appears as though private dentistry including implant provision is now a sector that is thriving. How long that continues will probably depend on the economy as the full impact of this crisis has yet to be fully understood in terms of the UK economy.
Currently, the implant market is stronger than ever in the UK and we hope that in spite of the wider effect on the economy our patients are placing higher value on their dentition, so hopefully they will continue to invest in the dental sector.

The Netherlands

Dr Jan Willem Vaartjes
President of the Dutch Dentist Association
(Associatie Nederlandse Tandartsen, ANT)
Chair of the Dutch Association
for Implantology (Belangenvereniging
Implantologie Nederlandse, BIN-EDI)

1 The transmission of the virus is at the moment peaking, which made the government decide for a partial lockdown. Contact professions as hairdressers etc. are still able to work. Dentists are considered to be a medical contact profession, but even when the lockdown will be more strict with contact professions closed, it is not likely that dental offices have to close.

2 However, the situation with COVID-19 also made patients more careful and there is also more illness (waiting for test results) of employees. That's why the turnover of the dental offices is around 95 % at the moment from what would have been normal.
When we monitor the transmission of COVID-19 under dentists, there seems to be no extra risk over what is seen under the normal population. There are no cases known of patients who are infected in a dental office. Before patients are allowed to come in a dental office, they have to answer questions that they have no COVID-19 (triage).
In the dental office they have to rinse with H_20_2 or CPC for AGP procedures. We work for non-COVID-19 suspected patients with face shields and surgical masks II/R.

Turkey

Professor Hakan Özyuvaci
Private Dental Clinic, Istanbul/Turkey
Member of the European Committee of BDIZ EDI

1 The number of COVID-19 infections in Turkey is on the rise again. Due to the size and density of the population, Istanbul has the highest number and percentage of cases. The highest risk group for contamination is people using public transport, which is a large part of Istanbul population. Some of the public and large municipal hospitals have been converted into pandemic hospitals that only care for COVID-19 patients. Every time you visit a café, restaurant, and any public place, the temperature and symptoms are checked. There are information posters everywhere about COVID-19 and how to prevent its spread. There is also a news programme on TV about COVID-19. Furthermore, there are also many public posters about COVID-19. The Ministry of Health reports daily on the number of people infected and the ongoing fight against this pandemic. People are using face masks everywhere, and common sense about masks has meanwhile developed in Istanbul.

2 The waiting room in our dental clinic is closed for patients or companions to protect us from cross-contamination. We only admit patients according to the concept of slow dentistry: we plan at least 60 minutes for each session. Each patient is monitored for temperature and symptoms. Before each session we disinfect and ventilate the room with HEPA- filters. In order to protect the patient's clothes and the staff's gowns from contamination and to avoid cross-contamination, both the team and the patients always wear disposable surgical gowns in the treatment room. Even if no aerosols are generated, the patient may sneeze or cough during the treatment, so we always wear an FFP3 or N95 mask and a face shield during each session, regardless of the type of treatment. Only one dentist, one dental assistant, one patient and no visitors are allowed in the room during the sessions. The room is constantly ventilated with HEPA filters. To prevent circulation in the operating theatre, no air conditioning is on operation during the aerosol-generating procedures.

Poland

Professor Andrzej Wojtowicz
Head of the Department of Oral Surgery,
Medical University of Warsaw
President of the OSIS-EDI
(Polish Osseointegration Association)

1 The Polish government recently declared "red covid zone" for the whole country.

2 In the dental office, patients are scheduled in a 1 hour rhythm and they don't see each other. There is an examination for patients whether they've been in contact with the corona virus. In the treatment room there are only the dentist and two assistants, one active and one passive. Further, we use ozone and UVC, e.g., the impressions for prosthetics are treated with ozone.
At the dental department of the University, the work is allowed in every other unit. For each treatment chair only 4 persons are planned, 2 of them students. All lectures and seminars are online only.

Macedonia

Dr Fisnik Kasapi
President of the Albanian Implantology Association in Macedonia

Dr Gordana Apostolova
President of the Macedonian Association of oral surgeons

1 In the republic of North Macedonia, the situation with COVID-19 pandemic is monitored on a daily basis. The number of newly found positive patients on daily basis ranges from 30–40 %. The total number of active cases is currently 12,000, 835 were hospitalized, and the total number of deaths is 1071 until today, 5 November 2020.
The hospital facilities are overcrowded and therefore, the reorganization of the university clinics and the rotation of the staff for admission of patients with COVID-19 has started (dermatology clinic, neurology, respiratory diseases and pulmonology). On the other hand, only urgent patients are admitted to the hospital, while outpatient examinations are performed normally. There have been only 5 positive cases among the health workers.

2 Dental offices have adapted to work in pandemic conditions. Patients are admitted exclusively by appointment, using a barrier, disinfection of hands and surfaces, UV sterilization lamp for the air, protective equipment for the doctor and the assistant. The best protection is to treat all patients positive to COVID-19. For bloody interventions that use high-speed machines that produce aerosols (oral surgery interventions, ultrasound cleaning, dental preparations), patients are admitted with a negative PCR test not older than 72 hours.
For patients with confirmed diagnosis of COVID-19, with urgent necessity of dental service, a new Covid Center has opened on the premises of the University Dental Clinical Center with a separate entrance and a separate office for a patient and a room for staff preparation. The protocol for preparation, operation and waste disposal is standard as required by the WHO.

Germany

Christian Berger
President of the BDIZ EDI
President of the Bavarian Dental Chamber

1 From 2 November to 20 December we face a partial lockdown due to high infection rates. The rates are between 0 and more than 500 infections per week among 100,000 inhabitants in different German regions. The government tries to reduce infections down to less than 50 (as it was in summer) and implements restrictions in areas with more than 200 infections.
Schools and preschools are open; hotels are open for business travellers only; restaurants and gyms are closed. Only two different households are allowed to meet at home or in public. Since chancellor Merkel wants to grant people family reunions for Christmas, the lockdown will last until Christmas and restart at New Year.

2 Dental offices are open for patients by appointment only. The anamnesis takes place on the telephone. However, visitig the dentist remains hesitant. All kinds of dental treatment are available according to the consent between patient and dentist. Dental chambers are working to combat patients' fears.
In most dental offices, a special care has been installed: from using ventilations in the rooms to wearing PP kits and using protective means like face shields and mouth masks for both doctors and assistants, use of high- vacuum suctions for aerosol- generating procedures and protective eye wear for the patients during treatment and mouth masks in the office.
Dental treatment proved to be safe, and dentists are well able to deal with infectious diseases – not only COVID-19, but also HEP and some others. In Germany, there is not a single known case of a patient being infected in a dental practice.

Portugal

1 "The situation is very serious". These are the words said recently by our prime minister, who, following the meeting of the council of ministers, decreed a state of emergency. In April, the country stopped, as well as all dental offices, which were one of the first places forced to close. Now, the measures are increasing, with limited circulation on the street and reduced commerce.

2 Dental offices have taken all the necessary steps to be able to fully function. The class got together a lot to find suitable personal protective equipment. In a time of scarcity, disinfection techniques and screening of patients were improved and there was a temperature screening and monitoring of companions and appointment times. These new challenges were an opportunity to develop personal protective equipment together with local companies. It has been a real movement of enthusiasm among everyone. And therefore, we have no doubt that dental medicine in Portugal is safe and patients also feel safe, in a new reality.

Professor António Felino
Member of the Portuguese Society of Oral Surgery

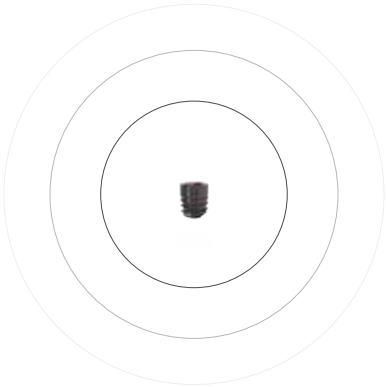
Dr Ines Pereira
Instructor of the faculty of oral surgery at the University of Porto

India

1 Currently, we have close to 8.5 million cases that have been reported so far, of which 7.5 million people have recovered; while the rest have been undergoing treatment.There are close to around 50–60 thousand new cases that have been recorded every day and the death rate according to earlier has been drastically come down. We could definitely say that the COVID-curve has plateaued compared to June or July, when there was a seek of cases and on a day- to- day base, and an increase of 5–10 thousand new cases. Each day there was an increase of 5 thousand more cases.
Currently, the lockdown has opened up completely and there are no more restrictions on the use masks and social distancing. All the restaurants, hotels, gyms, lounges, pubs have all opened up. The same applies for hospitals and dental practices. As of 21 March, there was a total lockdown for 95 % of the clinics, where only emergency care was done through online consultations. Trauma cases were attended in medical hospitals by maxillofacial surgeons.

2 Gradually, in mid May, 20 % of the clinics started opening up and by June and July, almost 80 % of the clinics private practices were open. The same went on further. Currently, by September and October, almost 95 % of the dental clinic practices have opened up.
However, the dental practices haven't been the same as before. All the elective procedures were earlier postponed by the dentists and currently, they are still being postponed by the patients. So, the elective procedures like cosmetic treatments and implants treatments are not carried out at the same frequency as earlier. A special care has been employed in most dentaloffices. The use of ultra violet light chambers, air purifiers with HEPA filters, the use of high ventilations in the dental offices, wearing of PP kits for both doctors and patients, the use of high- vacuum suctions for aerosol generating procedures and the use of protective means i.e. face shields and mouth masks for dentists and protective eye wear for the patients, have all been incorporated to vanquish this pandemic.

Dr Vikas Gowd
Dr Gowd's Dental Hospital
Banjara Hills
Hyderabad/India



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Musings on proportionality

Fundamental rights in a crisis

There is one legal concept that dominates the socio-political debate these days – the concept of proportionality. The risk of the infection by corona virus and the devastating consequences for human health of this virus disease, possibly including even death, has prompted us to take a fresh look at this concept.

Peter Knüpper, solicitor

State-mandated restrictions on our way of life, on our fundamental rights, have stimulated political, legal and social reflection on what legal requirements and administrative decrees – compulsory mask-wearing, bans on accommodation, free assembly, provision of food and drink or even transportation, curfews, reporting obligations, quarantine – are legitimate, appropriate and necessary in order to contain the pandemic and the associated risks to health and survival and on whether the associated federal and state interventions are appropriate. Only in the proverb does the end justify the means.

Examining the permissibility of restrictions to individual fundamental rights is an elementary task for any lawyer. The health care professions will be confronted with the issue of the proportionality of their decisions in the context of therapy, and proportionality is therefore an important concept for them as well.

The law already restricts the therapeutic freedom of physicians, dentists and psychotherapists when treating patients covered by statutory health insurance. Such treatment must follow the principle of being "sufficient, effective and economical"; medical services must not exceed the "limits of what is necessary" (Section 12(1)(1), German Social Security Code, vol. V).

However, even without the economic-efficiency requirement of the German Social Security Code, in the presence of multiple treatment alternatives, therapeutic decisions are not to be based solely on the skills of the practitioner or the technical options available, but on the benefits to and the needs and expectations of the patient. It is part of the physician's responsibility to reconcile therapeutic options and medical needs.

This raises a question that is not merely legal but quintessentially ethical in nature: Proportionality implies appropriateness. It implies moderation within the extended realm of possibilities. Any excess is disproportionate, and this is also true medical treatment. First and foremost, the principle of "primum nihil nocere" will apply; patients should not and must not suffer any harm from their medical treatment.

An eye for an eye, a tooth for a tooth?

To find "right reason in action" requires wisdom, writes *Aristotle*. Later, the Catholic Church declared this cardinal virtue to be the "charioteer of the virtues" that guides all other virtues by setting rule and measure. *Protagoras*, the Greek philosopher of the fifth century BC (not to be confused with *Pythagoras*, who put forms and numbers in the correct relationship to each other), handed down the ambiguous idea that "man is the measure of all things". Today, this homo mensura statement forms a standard for government action – at least in democracies. It is thus considered a guideline for examining the proportionality of laws, ordinances and administrative acts.

The changes in the meaning of the principle of proportionality since antiquity can be traced in criminal law. The punishment of a perpetrator has long since ceased to be based on the principle of "an eye for an eye, a tooth for a tooth", found as early as in the Babylonian laws of the Codex Hammurapi. Starting from the basic idea of human dignity, modernity has developed alternatives to this so-called "talion" principle in order to set punishable acts and their consequences, offence and punishment in relation to each other.

In the private sphere, too, "right conduct" becomes the norm of conduct: "Act only according to that maxim whereby you can, at the same time, will that it should become a universal law" (in the *James W. Ellington* translation). *Immanuel Kant* emphasized the responsibility of personal action. His Categorical Imperative, popularly expressed as "Do not do to others what you do not want done to yourself", characterizes the thinking of an enlightened secular world.

However, the principle of proportionality is a guideline that does not only apply to individuals.

Based on the Constitution

In the government realm, the requirement to reconcile the various forms of interference with civil liberties applies. The options for legislators to restrict fundamental rights are themselves limited. In its so-called "pharmacy judgment", the Federal Constitutional Court proclaimed pertinent principles more than sixty years ago (decision 1 BvR 596/56 of 11 June 1958), that legislators have to align themselves with to this day when intervening in the free choice of occupation or profession and the freedom to exercise it, which is guaranteed in Article 12(1), German Basic Law (constitution). The freedom to exercise a profession may only be restricted if reasonable considerations of the common good make this seem appropriate. Restrictions on the choice of profession are only permissible if the protection of particularly important public goods unconditionally mandate them. If such a restriction is unavoidable, the legislator must always choose the form of intervention that least restricts the fundamental rights, by balancing the various interests.

This balancing of interests and the resulting laws have the consequence that physicians and dentists are not unrestrictedly free in their choices or exercise of their profession. The typical liberal professions are regulated professions. The fundamental rights of the dentist, apart from the free choice of occupation and the free practice of the profession, include in particular the freedom of association (Article 1, Basic Law) and the right to free development of his personality (Article 2(1), Basic Law), are limited by the legislator: university laws and admission ceilings restrict the possibility to study dentistry. The Dentistry Act and the Licensing Regulations restrict access to the profession after the completion of studies and state examination. The standard scale of fees for dentists (GOZ) limits, based on Section 15, Dentistry Act, restricts the right to charge an appropriate fee for dental services. Dental treatment of patients covered by statutory health insurance requires registration, which is contingent on compulsory membership in a regional association of statutory health insurance dentists. In addition to the legislature, the public administration is also bound by the principle of proportionality, for example when it comes to revoking a dental license.

Is it possible to act "underzealously"?

Holders of fundamental rights can have all these state actions examined in court for their conformity to the constitution and thus lay claim to them as defensive rights. Fundamental rights also form the basis of the right to participation opportunities, e.g. through elections, and of the entitlement to benefits. In recent decades, the question has increasingly come to the fore – not least as a result of the Federal Constitutional Court decisions on abortion under Section 218 of the German Criminal Code – as to whether the state has a duty to protect the legal assets provided for by fundamental rights.

In this respect, a dentist could ask, for example, whether keeping the point value of the fee schedule unchanged for over more than 30 years, as has been the case in Germany regardless of economic developments during this period (which is clearly a restriction of the freedom to exercise the profession!) is at all proportionate? In 2013, the Second Chamber of the First Senate of the German Federal Constitutional Court – ruling on the basis of a constitutional complaint by BDIZ EDI – did not see any reason to declare this price moratorium unconstitutional at that point.

And should not the Licensing Regulations for dentists have been regularly adapted to the current state of science and technology over the last

50 years? A question that has never been answered to date. Would restrictions on the operation of an in-practice dental laboratory, as demanded by the Dental Technology Employers' Association with the support of individual constitutional lawyers, be constitutional? Probably not, because the manufacture of dental technology products has always been part of the dentist's job description, and the legislators are obliged to protect conventional job profiles.

Moderation is wisdom

In this context, the question arises whether the abolishment of the prerogatives of the specialist law of the medical professions by current infection protection legislation violates this duty to afford this protection[1]. In future, if an epidemic situation of national significance exists, members of the nursing professions will be allowed to carry out the necessary medical and dental measures on their own responsibility under certain conditions. This partially overrides the provisions of the Licensing Regulations and the Dentistry Act.

Was there any reason to doubt that dentists in private practice could no longer guarantee the treatment of acute dental disease during the pandemic? Were the arguments in favour of the new regulation sufficiently balanced, including under patient protection aspects? Reasonable doubt must be permitted. By comparison, the decreed delayed entry into force of parts of the new Licensing Regulations for students who have begun or will begin attending dental school prior to 1 October 2021, "to protect the population in the event of an epidemic situation of national importance", would appear almost harmless by comparison.

But *Jens Spahn*, German Federal Minister of Health, wants even more competencies. A further amendment to the Infection Protection Act is intended to allow the ambitious Christian Democratic Union politician to enact ordinances that bypass both chambers of the German Parliament. Even *Spahn's* fellow party members such as *Carsten Linnemann*, deputy chair of the joint CDU/CSU faction in the German Bundestag, has viewed this attempt critically.

It is also worrying that *Markus Söder*, the Bavarian Prime Minister (Christian Social Union) suddenly appears entirely unconcerned about transferring additional powers to the federal government, which puts into question elementary principles of German federalism, as a reaction to the critical growth in the number of coronavirus cases in his state. Again, the question arises whether this would still be proportionate. One does not have to be a corona denier or conspiracy theorist to be concerned that in the current crisis, regulatory principles seem to be slipping away, which could cause imbalances in our democracy.

So what, then, is proportional?

The principle of proportionality today is enshrined in the Basic Law as a central principle, unlike in Germany's first democratic constitution of 1919. Because the fathers and mothers of the Constitution failed to define the principale in normative terms, constitutional lawyers have been discussing whether this principle is rooted in pre-statutory or supra-statutory law, in natural law, or whether it can be derived directly from the fundamental rights. The constitutional principle of the Basic Law (Article 20(3)) has also been considered as a legal source. It is undisputed that the legislative, executive and jurisdictional branches are bound by the principle of proportionality. In this respect, the academic debate about its classification need not interest the legal layperson. The dispute, however, shows one thing: we are dealing with a complex legal issue. The concrete application of this principle in the examination of state actions to contain the coronavirus pandemic shows the dilemma the branches of government find themselves in as they seek a balance between freedom and security.

One example: In October 2020, the Administrative Court of Baden-Württemberg had to decide whether a corona ordinance for the closure of "prostitution facilities" where "erotic massages and sexual services in the BDSM/domina area without sexual intercourse" were offered was legal. The sitting judges concluded that the general ban violated the principle of proportionality, and they invalidated the ordinance. Their reasoning was that because the state government of Baden-Württemberg had not substantiated their allegation that prostitution facilities typically develop into "superspreader venues", there was no reason to close them. According to the administrative judges' own assessment, this applied all the more so "because the provision of sexual services is usually limited to the presence of two persons and extends over a limited period of time, something that distinguishes this activity from constellations such as celebrations in a family circle or other large events" (as per the court's press release of 6 October 2020).

In June, the same administrative court had rejected two emergency appeals against the closure of prostitution centres on the grounds that the practice of prostitution, even if limited to sexual massages, "regularly aims precisely at establishing the closest possible physical contact, which leads to significantly increased breathing activity", which would increase

[1] Infection Protection Act of 20 Jul 2000, Federal Law Gazette I, 1045, last amended by Article 3, Law of 27 March 2020 I 587, introduced by Article 1 (5), Law of 27 March 2020 I 587, effective 28 March 2020.

the risk of infection. The increased physical activity and breathing frequency, the court held, posed a concrete hazard of increased emissions of potentially infectious aerosols in enclosed spaces. In addition, the same prostitutes regularly "serve multiple different customers every day" on the same premises, which could greatly promote the spread of infection.

Acting proportionally

It is difficult to balance legal interests, even though is necessary ahead of any evaluation proportionality test. Such evaluations, even in court, are invariably shaped by the values and personal experience of the decision-makers. Being able to decide between "too much" and "too little" requires sound judgment and accumulated experience in all wakes of life. The more specific the subject matter, the more difficult the decision. This applies not only to the general administrative rulings in connection with the coronavirus pandemic. It is estimated that more than a thousand – often contradictory – administrative court decisions have been handed down this year.

But quoting the trite saying: "Two lawyers, three opinions" would not do justice to the special situation in which the state and this society, and ultimately every individual, find themselves in these exceptional times. There is no blueprint for how to master this crisis, nor is there any standard solution as to how to address the implied legal challenges.

But one truth remains: The separation of powers protects against arbitrary governmental action, and this includes the field of healthcare. If we all recognize our "duty to protect" and adjust our behaviour accordingly, we should still get through this time of crisis relatively well.

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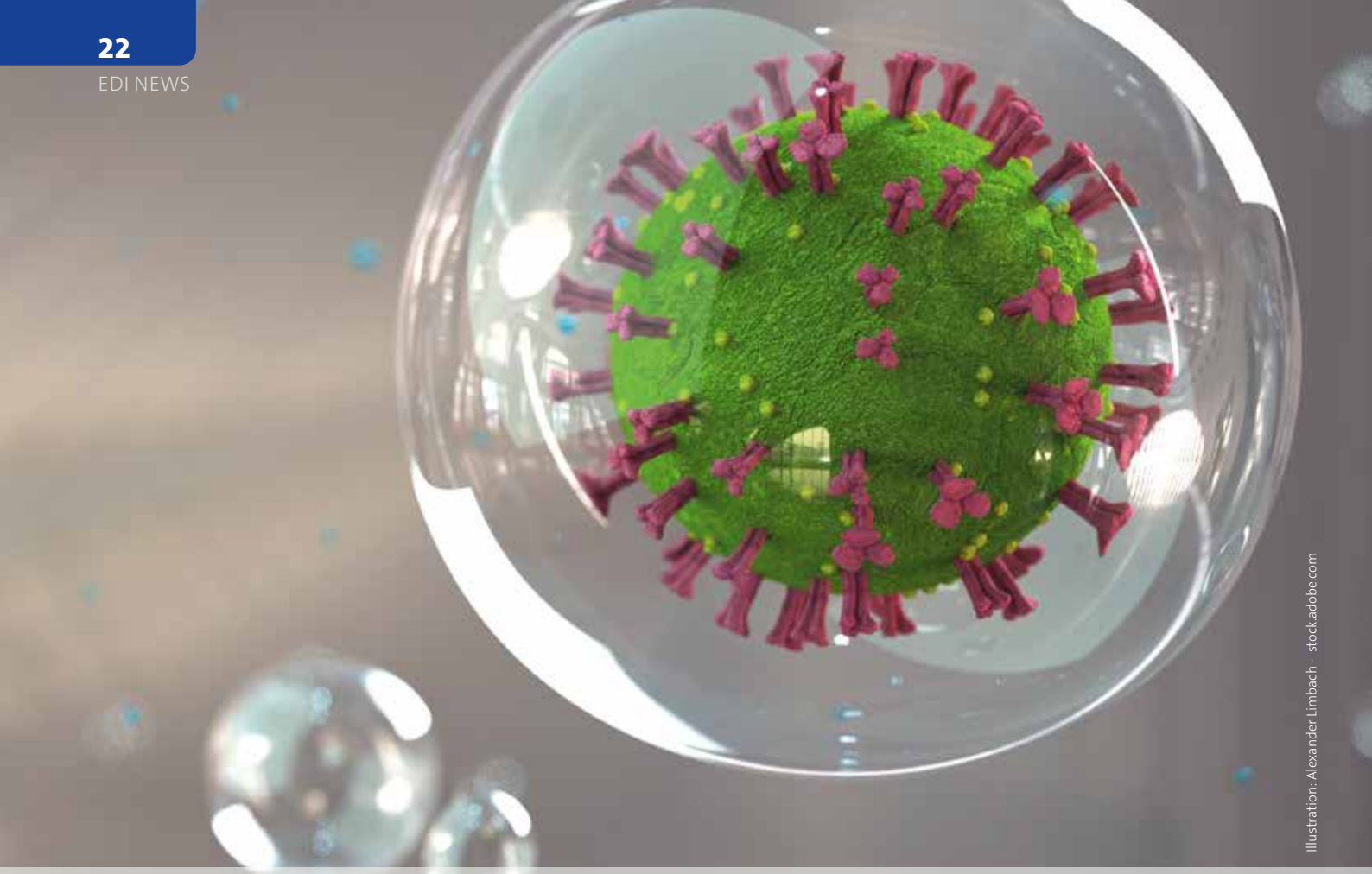

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New guidelines on droplets and aerosols

Dealing with aerosol-borne pathogens in dental practice

The German Society for Dental, Oral and Maxillofacial Medicine (DGZMK) has set a so-called S-1-Guideline on the influence of aerosol-borne pathogens in the dental practice due to worldwide COVID-19 pandemic. Guidelines are valid until March 21.

Summary

Introduction: It is well known that droplets and aerosols may cause infections in dental staff [21]. Therefore, adequate protective measures against pathogens transmitted via droplets or aerosols from the patients' oral cavity are of great importance in dental practices. Due to close contact between dental professionals and patients' oral cavity and the formation of droplets, spray mist and aerosols during dental interventions, hygiene and precautionary measures are used in dental practice to prevent the transmission of infectious diseases.

Methods: Relevant information regarding the SARS-CoV-2 and COVID-19 pandemic was obtained from electronic databases such as PubMed, Cochrane library, Web of Science, using the following search terms: "SARS-CoV-2" or "COVID-19", "airborne transmission", "mouth rinse", "dental", "aerosol" OR "aerosol generating procedures", "droplet", "FFP2" OR "FFP3" OR "N95" OR "mask". Latest reports and guidelines from major health authorities such as the Robert Koch- Institut (RKI), Centers for Disease Control and Prevention (CDC), World Health Organization (WHO), as well as major national dental associations and health regulatory bodies were also referred.

Results: Protecting dental professionals and patients from infections while ensuring basic dental care for the population is of paramount importance. With that in mind, this guideline presents recommendations for dental practitioners during the COVID-19 pandemic.

Providing basic dental care and ensuring personal protection in dental practices

The World Health Organization (WHO) associates aerosol-generating medical procedures with increased risk of infection for medical staff from SARS-CoV-2 [53]. Depending on the current situation of the pandemic, it is recommended to avoid these procedures if possible. However, aerosols must not be equated with the spray mist that occurs in dentistry. It is generally known that spray mist can contain pathogens, but in a form that is strongly diluted with cooling water. The term aerosol basically defines a suspension of liquid and solid particles with a diameter of 5 µm, deposits and living or dead microorganisms in a gaseous medium [48, 49]. Spray is a droplet mixture of air, water, solids with particles and is visible to the naked eye. A rebound effect of spray occurs after the impact on the tooth or soft tissue, emerges like a bell from the oral cavity in the work area and, in addition to the spray mist, contains germs, abrasive particles, saliva and possibly blood [11, 14]. The transition from "droplets" to "aerosols" and vice versa is smooth and depends on the ambient conditions. Both aerosol and spray can contain transmissible pathogens [3, 23]. The word aerosol is often colloquially used for all of these potentially infectious media for the sake of simplicity. However, it can be assumed that aerosol-generating dental procedures are certainly less infectious than saliva or bronchial secretions due to the high proportion of cooling water. The present guideline explicitly refers only to the formation of spray and aerosols during dental work. Even if the regional prevalence of SARS-CoV-2 is high, all dental treatments that alleviate the patients' symptoms or prevent an existing disease from worsening must be guaranteed. It is important to differentiate between healthy or asymptomatic patients and suspected or confirmed COVID-19 infected patients, who should only be treated in compliance with special protective measures.

Triage of suspected cases

Suspected cases should be screened by phone or via a notice on the door at latest prior to the start of any dental treatment, preferably before the patient even enters the practice. Typical symptoms of an infection with SARS-CoV-2 and questions regarding potential contacts with COVID-19 positive patients in the past 2 weeks should specifically be asked. The body temperature might be measured as part of the triage of suspected cases. However, a large number of false positive results must be assumed. In addition, false negative results may occur if SARS-CoV2 infected people show no signs of fever or antipyretic agents have been used [43].

Entering the dental practice

When entering the practice, patients should be asked to wear a mask covering both mouth and nose until the start of treatment as well as afterwards. Consistent implementation of basic hygiene including hand hygiene is expected. When entering the practice, patients should be asked to wash or disinfect their hands. Depending on the epidemiological situation, magazines, toys and other expendable items might be dispensed within the waiting room [34, 38]. Since transmission via contact surfaces cannot be ruled out, in addition to basic hygiene, regular disinfection of contact surfaces should be carried out [34, 52]. In order to protect risk groups from infection with SARS-CoV-2, the dental treatment should be integrated into the daily routine in a way that there is as little contact as possible with other patients. Suspected and confirmed COVID-19 cases should preferably be treated in special centers, clinics or practices. If this is not possible in exceptional cases, necessary treatments should be carried out in the dental practice in strategic and or scheduled separation from the patients attending regular consultation, while ensuring all hygiene and safety measures specified for this purpose.

Distancing

Patients should be kept at a distance from staff by observing the minimum distance of 1.5 m for registration [34, 38]. Installing plexiglass shields at registration further protects employees from droplets. The distance between patients from different households should be at least 1.5 m in order to minimize the risk of the infection being transmitted via droplets [34, 38]. Employees should wear surgical masks permanently, even outside treatment rooms, and maintain the minimum distance requirement, also during breaks and in changing rooms [2, 6, 50].

COVID-Testing

Personnel showing symptoms of a COVID-19 infection should be isolated immediately and tested for the presence of an infection using PCR. There is not enough reliable data to routinely test symptom-free employees in dental practices, but it might be useful in case of a situation with increased risk. Patients who show symptoms of a COVID-19 infection should only be treated in case of emergency until a negative test can be produced. In cases of a dental emergency, emergency treatment should be carried out in compliance with special protective measures.

Dental emergencies in symptomatic and infected patients

If possible, all dental treatments for symptomatic patients or confirmed COVID-19 patients should be

postponed to a later date. In case of a dental emergency treatment (pain, abscesses, infections, complications e.g. secondary bleeding, trauma, etc.), the following measures should be applied:

- strict spatial separation from all other patients.
- patients should wear a surgical mask until the start of treatment.
- where possible, schedule emergency treatment at the end of the day.
- maximum PPE
  - (1) safety glasses/face shield
  - (2) FFP2/FFP3 or N95 mask
  - (3) hygienic hand disinfection
  - (4) disposable gloves
  - (5) headgear and socks (to reduce self-contamination)
  - (6) long-sleeved liquid-repellent protective scrubs
- Final cleaning and disinfection of all surfaces with at least limited virucidal surface disinfectants.

Aerosol formation in dental practices, protection through surgical masks and treatment cautions

Emission from persons

Droplets are mainly produced by humans when they speak (sing), cough and sneeze. Droplets that are created when speaking, coughing or sneezing range from 1 to > 10 µm in size [54]. The emission of particles containing bacteria acts 400 : 7 : 1 when sneezing : coughing : talking [15, 32, 41]. Droplets larger than 8 µm in size sediment on surfaces immediately, and no later than following a maximum of 20 minutes. With a size of around 4 µm, droplets sediment within 90 minutes. Smaller droplets (aerosols) can remain in the air for up to 30 hours and can then be transmitted over greater distances by air currents [15]. Depending on the relative humidity, droplets can turn into aerosols [7]. When droplets float in the air, they lose water and become so-called droplet nuclei, which are the size of aerosols. In stagnant room air, the size of the droplets reduces from 12–21 µm to around 4 µm within about 10 minutes [51].

The dehydration of droplets can (depending on the respective microorganism) kill or inactivate bacteria and viruses contained in the droplet. Hence the transition from droplets to droplet cores (or the drying out of aerosols) does not necessarily result in further infectivity of the microorganisms contained. Depending on surrounding conditions, the statements of experimental studies on the detection of SARS-CoV-2 viruses in aerosol that are capable of reproducing differ. Virus particles have been found in aerosols in some studies [29, 52]. Whether and how quickly the droplets and aerosols sink or remain suspended in the air depends on the size of the particles as well as a number of other factors, including temperature and humidity [26]. From the studies up to date, no statement can be made regarding the infectiousness of the virus particles.

Emission from water-cooled dental instruments

With the introduction of high-speed dental preparation instruments, the need for effective cooling of work areas arose in order to avoid thermal damage to the pulp-dentin system. The required amount of liquid for this lies at approx. 50 ml per minute. The liquid is swirled around and partially reflected on various intraoral structures and the instrument itself. Spray mist rebound contains both large liquid droplets and aerosols. The majority of the spray mist rebound consists of droplets ≥ 10 µm [5]. Around 90 % of the larger particles in the dental spray mist with a size of approx. 20 µm fall on the patient`s face or body surface [38]. When using a dental turbine at a distance of 10 cm from the oral cavity of the treated patient, the number of particles with a diameter between 0.3 µm and 0.5 µm increased by a factor of 100 and for particles with a diameter of 7 µm by a factor of 3 [27]. The number of particles ≥ 10 µm only increased by a factor of 1.7 when the turbine was used at a distance of 20 cm above the oral cavity, as they sediment quickly. Aerosols and droplets that arise during dental treatments are described in the literature with particle sizes of 0.5–20 µm [40]. Due to their low sedimentation speed, aerosols can float several meters away and also infect people in other rooms or people who are in the treatment room at a later point in time [18]. However, the number of virus copies present in liquids, droplets or aerosols is not to be equated with infectious viruses. The exact infection dose required in virus copies to trigger an infection with SARS-CoV-2 is currently unknown.

Droplets contain significantly more liquid and therefore more microorganisms than aerosols, hence the necessary infectious dose is reached much faster through ingestion of a droplet. The following calcula-

Diameter of the droplet	0.3 µm	0.5 µm	1.0 µm	5.0 µm	10 µm
Volume of the droplet	0.014 μm^3	0.065 μm^3	0.52 μm^3	65.5 μm^3	523.6 μm^3

Table 1 I Relationship between volume and diameter of droplets

Type of mask	Minimum retention capacity of the filter with regard to NaCl test aerosol [respectively Staphylococcus aureus]	Maximum permissible total leakage on subjects
FFP1	80 %	22 % [a]
FFP2	94 %	8 % [a]
FFP3	99 %	2 % [a]
NIOSH N95	95 %	10 % [b]
NIOSH N99	99 %	10 % [b]
NIOSH N100	99.97 %	10 % [b]
Medical masks (S. aureus)	[95 %]	Not specified

Table 2
Comparison of the requirements for particle-filtering half masks and mouth-nose protection (MNS) [13];
[a] specified for FFP masks with NaCl aerosol in accordance with DIN EN 149 [12];
[b] for NIOSH-N masks derived from the Assigned Protection Factor (APF) of 10 specified by NIOSH. This requires a passed qualitative or quantitative Occupational Safety and Health Administration (OSHA) fit test [19].
(Table 1 and 2: L. K. Mueller)

tion of the amount of liquid transported in particles of the corresponding size is clear.

Effectiveness of surgical masks and simple textile mouth and nose covers that protect against large particles, as well as "physical distancing" of 1.5 to 2 m as part of the COVID-19 preventive measures indicate that SARS-CoV-2 is mainly transmitted by droplet infections [9, 55]. Both measures only reduce droplets, but not aerosols. Transmission of SARS-CoV-2 by aerosols has also been observed but requires longer contact times with the aerosol (choir samples) with low air exchange and/or increased humidity (slaughtering businesses) in the room in order to achieve the necessary pathogen dose. In dentistry, occurrences of such "super spreading events" are completely absent.

In conclusion, the current evidence base is insufficient to confirm or exclude airborne transmission with SARS-CoV-2 in the context of dental treatments [8, 36]. As such, procedures for reducing the spray mist, consisting of droplets and small, floating particles, represent basic occupational safety measures for the dental team. Since even trained, ergonomically designed dental technology cannot completely prevent the emission of droplets and aerosols from the patients' oral cavity, putting in place additional measures to minimize the transmission of infection becomes inevitable.

Protective effect of face masks

The recommendations of the Commission for Hospital Hygiene and Infection Prevention (KRINKO) at the Robert Koch Institute are considered state of the art in the prevention of infectious diseases in Germany. In case of respiratory infections or pneumonia caused by coronaviruses (SARS, MERS), the use of a FFP2 mask is recommended. For patients infected with seasonal influenza A or B, one MNS is sufficient. On the other hand, KRINKO recommends a respirator to prevent avian influenza. Patients with open pulmonary tuberculosis should be treated using a FFP2 mask. Patients with open pulmonary tuberculosis caused by multi-resistant Mycobacterium tuberculosis (multi-resistant tuberculosis, MDR-Tbc, or extensively resistant tuberculosis, XDR-Tbc) require the wearing of a FFP3 mask with the same pathogen and transmission path. This shows that the recommendations based on a risk analysis are not only influenced by the quality of the "face masks", but also the clinical consequences to be expected in the event of an infection. The physical and technical testing of respiratory masks is carried out in accordance with DIN EN 149 under practical conditions. Subjects are exposed to an NaCl test aerosol wearing a respirator. The median mass-related particle size of the aerosol is 0.6 micrometers. However, even within these test conditions there is no absolute protection against the inhalation of aerosols (Table 2).

Whether this protective effect is also necessary for infectious diseases that are transmitted by much larger droplets from the respiratory tract or by dehydrated aerosols cannot be derived from these model studies.

Recommended use of masks and face shields

The additional use of face protection shields might further increase safety. Dental staff should wear FFP2 / FFP3 or N95 masks if contact with patients with suspected or confirmed SARS-CoV-2 infection takes place. During treatment of patients, who are not suspected to be infected with SARS-CoV-2, dental staff should wear a surgical mask. The best possible barrier function is guaranteed through correct fit of the surgical mask (good adjustment in the

nose area and maximum lateral tightness). There is currently no reliable data available for the general wearing of a FFP2/FFP3 or N95 mask for all dental activities using water-cooled instruments.

Reusing masks

In the event of supply shortages in connection with COVID-19, mouth- nose protection and FFP/N95 masks might be reused or reprocessed for specific persons. A reasonable approach to reusing masks might be to provide each employee with at least 5 masks and to use them alternately every day, since a possible SARS-CoV-2 contamination of the 4 unused masks is inactivated after 5 days at the latest (European Centre for Disease Prevention and Control). Alternatively, preparation of masks specific to individuals might be carried out. Reprocessing should take place in sterilizers (e.g. at 121 °C), as the method has proven to be effective and gentle on the material [10].

Treatment precautionary measures

Rinsing the mouth or gargling with mucosal antiseptics shortly before dental treatment could briefly reduce potential virus concentrations in the throat and mouth and thus in the spray and aerosol [24]. Clinical studies regarding the reduction of SARS-CoV-2 currently do not exist for any of the mouth rinses listed below. There are indications of limited virucidal effects (against enveloped viruses) for the following antiseptics:

- ≤ 0.1 % Octenidin
- 1–1.5 % H O [38]
- 0.2 % Povidone-Iod [16, 28, 33, 34]
- 0.2 % Chlorhexidin [4, 33, 37]
- 0.2 % Cetylpyridinium Chloride [31]
- ≤ 0.25 % Natriumhypochlorit [20]
- Dequonal [33]
- Listerine cool mint [33]

Just before procedures, patients should be asked to rinse their mouth for 30–60 seconds. Further measures to reduce potential virus contamination by droplets and aerosols should be applied in the context of the respective pandemic situation and are listed below. Spray mist extraction system on the treatment unit, used with an effective systematic extraction technique, reduces the spray mist rebound and aerosols by 2/3 [42]. During dental treatments of suspected and confirmed cases, it is recommended to apply all protective measures as listed below. There are currently no adequate scientific studies on the effectiveness of additional suction devices in combination with HEPA filters or disinfection systems to reduce the viral load in dental treatment rooms.

Precautionary measures

If possible, a rubber dam should be installed [1, 11, 34, 38, 47]. Consistent and high-volume evacuation should be guaranteed. Attention should also be paid to a diameter-optimized suction cannula (≥ 10 mm). If this is guaranteed, there is currently no reliable evidence with regard to effectiveness of any additional suction devices [1, 11, 22, 25, 30, 46]. Large-volume spray mist suction should also be used for treatment methods that are carried out without assistance, such as professional tooth cleaning. After treatments in which aerosols have formed, ventilation should be effective [34]. Almost all instruments rotating rapidly or vibrating at high or highest frequency in the dental practice require a cooling medium. Powder-water blasting devices also require a combination of air, liquids and powder to generate the cleaning jet, which is why all these instruments are inherent in the system with a pronounced spray mist formation [1, 34]. Therefore, their use should be avoided in COVID-19 suspected cases, if clinically possible.

Reference list can be found on the Website of the German Society for Dental, Oral and Maxillo-facial Medicine (DGZMK): www.dgzmk.de > S1-Leitlinie Aerosol-übertragbare Erreger

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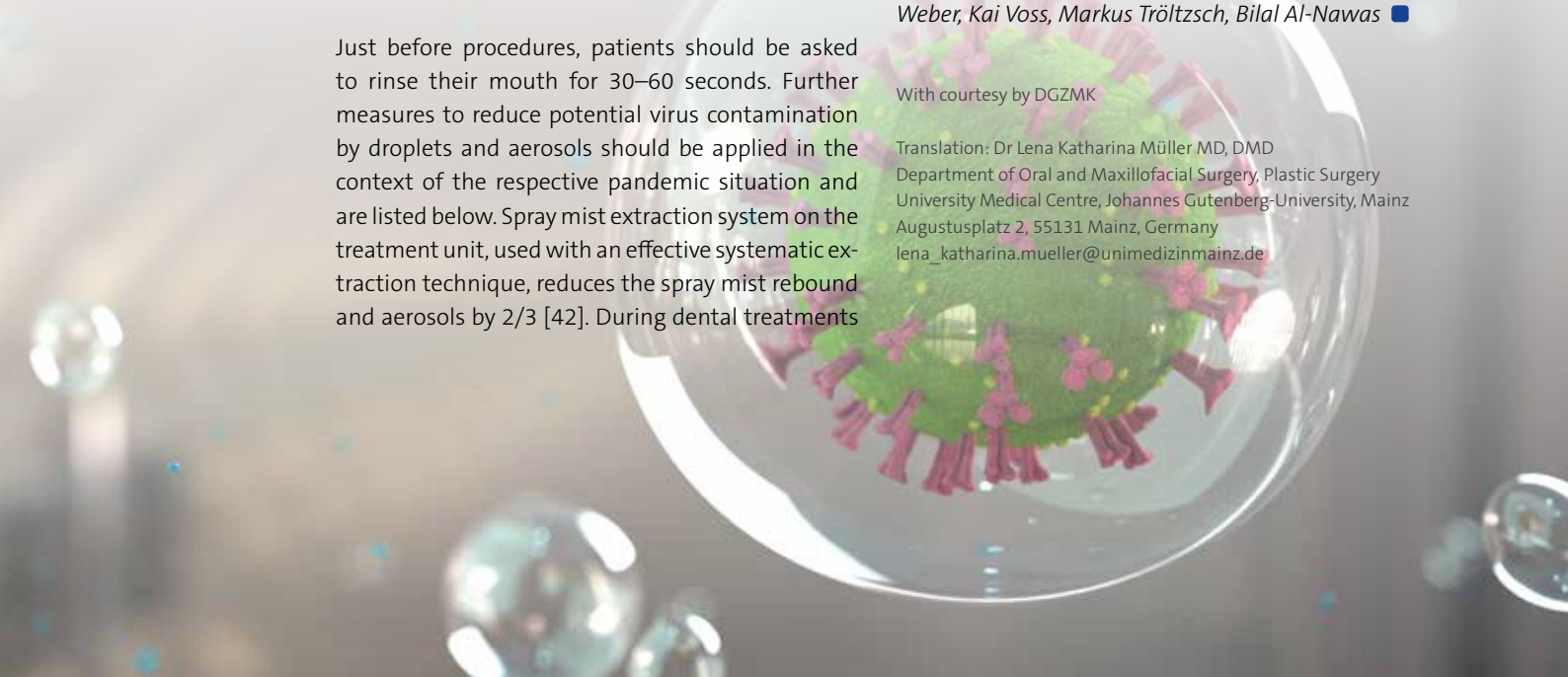

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International Dental Show to take place under strict hygiene protocol

Corona virus will not stop IDS

Hygiene and infection control is a core competence of the dental and dentist technician teams as well as of their dental industry partners, says the organizer of the International Dental Show (IDS), the Association of German Dental Manufacturers (VDDI). The IDS from 9 to 13 March 2021 in Cologne will also be conducted under a safe hygiene concept of Koelnmesse.

Under the title #B-SAFE4business, numerous measures can be found on the website www.english.ids-cologne.de which should demonstrate the highest level of professional safety to the visitors and exhibitors of IDS 2021.

Cancellations of participation

Even though not just a few of the global players among dental enterprises cancelled their participation in the IDS, the organizers are still focusing to let the event take place. The leading trade fair of the dental industry will, as usual, offer a comprehensive insight into the established and innovative processes and technologies for the practice and laboratory and will set a high standard in terms of hygiene. Only recently the German Dental Association (BZÄK) and the Association of Medical Professions ascertained: All dental treatments are currently possible thanks to the high hygiene standards. According to current cognitions, they have not contributed towards a higher number of COVID-19 infections among the patients or the dental treatment teams, nor have they in the past either. It is therefore recommended not to postpone treatments and to particularly not miss prophylaxis appointments.

Business as usual?

The entire trade fair philosophy will be reorganised. Health and safety of exhibitors, visitors and staff are declared to have highest priority. Measures include appropriate hygiene, maintaining sufficient distance between people at all times, and strict guidelines for

Photos: Koelnmesse GmbH, Harald Fleissner

the processes carried out at entrances, in the halls and at the stands. Organiser is relying on the professional conduct of exhibitors and visitors, and will carry out a full registration of participants. "We will utilise the flexibility and size of our site as well as the opportunities offered by our digital guidance systems", IDS says in the "key questions" online.

Hybrid formats

IDS will be offering a row of hybrid elements. The digital IDS platform is to provide information on products and system solutions, which enable the streaming of webinars, press conferences, events as well as one-to-one communications. Koelnmesse has over the last months already untertaken considerable efforts during the Corona crisis and has implemented concrete measures for the digitalisation of trade fairs into hybrid events. "We want to implement these digital tools that were developed over the past weeks for our gamescom and DMEXCO formats in a targeted manner for the IDS 2021, in order to be able to offer the exhibitors and visitors manifold participation options beyond the physical event in Cologne," stated *Oliver Frese*, Chief Operating Officer of Koelnmesse.

"The Corona crisis with all its restrictions and limitations in mobility and personal encounters encourages us even more to use the communication tools that are available to us, in order to make IDS and its manifold tasks for and contributions to the industry available to those who won't be able to make it to Cologne this time. In this way, we are reinforcing IDS as a dental platform in both the analogue and online world," said a convinced *Novica Savic*, VDDI member of the Advisory Board and Head of the hybrid IDS Task Force.

VDDI Chairman, *Mark Stephan Pace*: "The leading global trade fair IDS is writing a further new chapter in its almost one- hundred- year history. It has continually depicted the current developments of the dental market and its players over the past decades and supported the users with innovations. It is now time to further develop IDS in a new era. The technological innovations especially of the past years are opening up a new level of communications with our customers as well as the whole dental industry, which is already very digital-savvy in the production and application areas."

Code of conduct

IDS will present 3–5 percent NaOCl solutions and pellets. Beyond this it is also recommended to have intraoral Xrays taken extraorally as far as possible during the Corona pandemic. IDS offers an overview of OPG and DVT devices with the option of fading in the treatment region in a well-visible manner. Furthermore, the visitor will see options of how the dentist can reduce his own risk of infection by using an OP microscope through a pre-fabricated Plexiglas shield.

"Due to the Corona pandemic, hygiene themes are of utmost importance to us all," stressed *Dr Markus Heibach*, Executive Director of the Association of the German Dental Manufacturers e.V. (VDDI). "As the leading global trade fair of the dental industry, IDS 2021 shall offer the opportunity during these turbulent and complicated times to engage in an exchange, bundle one's forces, strengthen long-term partnerships and establish new ones. Mutual trust ensues as a result, which in the aftermath of IDS will make everyday professional life more manageable and easier for everyone – and will as a financial consequence reduce the transaction costs."

IDS takes place in Cologne every two years and is organised by the GFDI Gesellschaft zur Förderung der Dental-Industrie mbH, the commercial enterprise of the Association of German Dental Manufacturers (VDDI). It is staged by the Koelnmesse GmbH, Cologne.

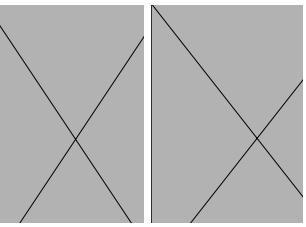
Source: VDDI, GFDI, Koelnmesse

More information
www.ids-cologne.de

BDIZ EDI will provide online lectures in 2021

Seminar offers

There is still a great demand for information on infection control, hygiene, and legal issues. The "BDIZ EDI informs 2021" seminars combine this information with updates on advanced dental topics in continuing professional development. International members and other interested parties can choose from several BDIZ EDI online seminars. Just tick the topic you would like to be presented online.



Dr Jörg Neugebauer
Dr Markus Tröltzsch

The "BDIZ EDI helps" has been relaunched as the "BDIZ EDI informs" series of online seminars. The crisis management that COVID-19 had made necessary and which had given rise to, among other things, various online seminars, has been received so favorably that BDIZ EDI would now like to provide dental practices with fast and well-targeted information and further training even internationally, in English.

The presentations will be broadcast online and live. Participants will have an opportunity for discussion with the speakers. Participation is free of charge for members. All participants will receive a certificate of participation.

Please look at the 2020 programme of seminars in the "BDIZ EDI informs" series. Send your selection either to the editorial office at office-munich@bdizedi.org or by fax to +49 89 720 69 888. BDIZ EDI will of course spread the news via Facebook and Instagram as well. The online seminars will be held in the evenings between 7 and 8 pm.

Send your selection either to the editorial office at office-munich@bdizedi.org or by fax to +49 89 720 69 888

☐ **Topic No. 1: Update on peri-implantitis; Guideline of the European Consensus Conference 2020**
Presenter: Dr Jörg Neugebauer (Landsberg am Lech, Germany), Member of the BDIZ EDI Board, 7–8 pm

About this seminar: Biological complications cannot be avoided completely; they occur at different times following the delivery of the implant restoration. The etiology of these complications is as diverse as the way in which they manifest themselves. This issue has been addressed three times before by the European Consensus Conference; this panel of experts has now re-evaluated the current literature and updated the recommendations of the Guideline. Dr Neugebauer will present the most recent findings from the literature with numerous clinical examples to ensure the best possible care for patients with peri-implantitis, with a view to avoiding implant loss and eliminating risk factors.

☐ **Topic No. 2: Update on digital implantology**
Presenter: Dr Markus Tröltzsch (Ansbach, Germany), Chair of the Academy of Dentistry and Oral Medicine (APW) of the German Society for Dentistry and Oral and Maxillofacial Surgery (DGZMK), 7–8 pm

About this seminar: In Germany, most implants are still planned the traditional way, using OPGs and physical models and placed without digital support, even though the tools for use in digital implantology are readily available. What do practitioners have to pay attention to, and what are the advantages and disadvantages of digital methods in oral implantology? Dr Tröltzsch addresses these questions and shows how the digital workflow can be integrated into everyday practice.

☐ **Topic No. 3: Update on bone augmentation surgery – Presenter: Dr Markus Tröltzsch, 7–8 pm**

About this seminar: For implantological restorations to achieve long-term stability, both hard and soft tissues must be available in sufficient quantity and quality. There are many ways in which this can be achieved or maintained. In this online seminar, Dr Tröltzsch, who was in charge of the new DGI/DGZMK Guideline on implantological indications for the use of bone replacement materials, will highlight the various "minor" and "major" techniques.
One of the topics Dr Tröltzsch will discuss is how tissue volume can be (re)built or maintained and which of the relevant techniques are suitable for practitioners with different types of practices and different levels of experience.

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BDIZ EDI at the 61st Bavarian Dentists' Day

The dental planet must keep on spinning

There is an ice age in the further education landscape in dentistry, since in-person courses are cancelled due to once again skyrocketing COVID-19 numbers. One of the few exceptions was the 61st Bavarian Dentists' Congress, even if it was slimmed down and subject to strict hygiene measures. The BDIZ EDI was not only a cooperation partner of the two-day scientific program in Munich but also played an active role. The BDIZ EDI Board presented "Implantology 2020" – the topic of the congress – in four halls, characterized by an enormous commitment and admirable expertise.

The representatives of BDIZ EDI clearly made their presence felt: BDIZ EDI President *Christian Berger*, who as President of the BLZK is also the head of the Dentists' Day and who is in close contact with the Bavarian State Ministry of Health and Care these days, with Professor *Joachim E. Zöller*, who was the scientific director of the congress, with *Associate Professor Jörg Neugebauer* as the moderator in the main hall and with the board members *Dr Stefan Liepe*, *Dr Wolfgang Neumann*, *Dr Nathalie Khasin* and *Dr Renate Tischer*, who moderated the discussions in the halls where the lectures were broadcast over two days.

BDIZ EDI Vice President *Professor Zöller* stated for implantology: "When it comes to prosthetics in dentistry, oral implantology is also becoming increasingly important. However, we at BDIZ EDI do not see ourselves as implantologists, we are dentists

Foto: BDIZ EDI

The board of the BDIZ EDI assumed the moderation of the Bavarian Dentists' Day in Munich. The picture shows (from left): President Christian Berger, Helga Karanikas from the Munich office, Dr Stefan Liepe, Dr Nathalie Khasin, Dr Wolfgang Neumann, Press Officer Anita Wuttke, Assistant Professor Jörg Neugebauer, Dr Renate Tischer and scientific director Professor Joachim E. Zöller.

Professor Knut A. Grötz

Dr Frank Zastrow

working in implantology. Because first and foremost we are dentists who want to preserve natural teeth. This is very important to us! Only when the tooth can no longer be preserved or is missing due to accident, illness or other reasons, an implant is often the best solution because it comes closest to the natural tooth". Meanwhile, the surgical concepts for implantation are diverse and mature and are mainly oriented towards prosthetics. The optimal implant prosthetics is therefore always the focus of the therapy.

The variety of topics presented by the scientific conference organizers over two days reflected the broad spectrum of implantology. This report focuses on the implantological topics. The conference started with a lecture by *Professor Knut A. Grötz*, Wiesbaden on the risks of osteonecrosis of the jaw (ONJ). He focused on antiresorptive therapy (bisphosphonates or Denosumab). On the one hand, both medications achieved a positive balance in the bone, and on the other hand, they were associated with ONJ which was difficult to treat. Apart from this, *Grötz* named tooth removal without safety masticatory claws, denture pressure points and periodontitis as the most important ONJ triggers. This would give the dentist a key role in preventing ONJ.

Dr Frank Zastrow, Wiesloch used current scientific studies to examine the question of when the use of bone replacement material is indicated and when working with autologous bone is advantageous in the reconstruction of intraoral bone defects in the context of implantological procedures. For the vertical structure, autologous bone material was to be preferred to bone replacement materials. The speaker also quoted the CCARD dental practice guide of the BDIZ EDI from 2013, which is still as up-to-date as ever: the Cologne Classification of Alveolar Ridge Defect provides a simple therapy-oriented defect classification for standard cases and considers three defect classes in order to identify the alveolar ridge defect as fully as possible and with regard to the therapeutic options (see Practice Guide 2013 at www.bdizedi.org).

General medical conditions and risk factors

Professor Christian Walter, Mainz already attracted attention at the 15th Experts Symposium in Cologne in February 2020 with his topic "Influence of general risk factors and generalized diseases on the risk of periimplantitis". He discussed the systematic and local risk factors in the pathogenesis of periimplantitis: smoking, alcohol use, genetic dispositions, diseases – including periodontitis and diabetes, and medications are among the systematic ones, whereas he considers factors such as oral

Professor Christian Walter

Professsor Anton Sculean

Professor Hans-Joachim Nickenig

Assistant Professor Arndt Happe

hygiene, cement residues, implant-crown interface, prosthetic design, implant quality and positioning, soft tissue configuration, osseous situation and the health of the neighboring dentition with regard to periodontium and endodont to be local. According to *Walter*, for example, poorly controlled diabetes worsens osseointegration.

The Berne periodontal treatment concept

The periodontological treatment concept developed at the University of Bern is certainly known beyond the borders. *Professor Anton Sculean,* Bern (Swizerland) talked about synoptic treatment planning, which was established more than 30 years ago and is based on scientific and clinical evidence. According to this, the avoidance of vertical relief incisions and the use of subepithelial connective tissue grafts or certain collagen matrices with or without enamel matrix proteins result in improved wound healing and predictable clinical outcomes. *Sculeans* conclusions: Clinical practice and scientific evidence have clearly demonstrated that periodontal therapy improves the long-term prognosis of teeth. Extraction should only be considered if tooth preservation is not possible or not realistic. Implants should be used to replace missing teeth.

3D-supported minimally invasive bone augmentation in implantology

For *Professor Hans-Joachim Nickenig*, Cologne the 3D-based procedure is more than just guided implant insertion. Based on the analysis of well over 1,000 cases in the upper and lower jaw and the morphological data obtained from this, he showed how modern technology and instruments can be further developed and optimized on the basis of three well-known augmentation procedures in different indication areas. For *Nickenig*, the 3D procedures allow a fine improvement in the accuracy and predictability of the implant procedure. Due to the knowledge of the individual anatomical conditions, these procedures also provide a good basis for the further development of minimally invasive procedures in the field. Based on several clinical case studies, *Nickenig* gave many practical tips.

Implantological soft tissue management in the esthetic zone

Soft tissue management is the domain of *Assistant Professor Arndt Happe*, Münster. Clinical studies have shown that connective tissue transplants can contribute significantly to the reconstruction of alveolar ridge defects. “Soft tissue management means more than surgical techniques,” said *Happe*. Soft tissue can and must also be conditioned with restorative components such as the abutment. According to *Happe*, color, macro, micro, and nano design of the transmucosal component play an important role here.

Dr Kai Zwanzig and Dr Frederic Hermann (connected online)

Professor Fouad Khoury

Professor Joachim Zöller

The benefits of guided surgery

Dr Kai Zwanzig, Bielefeld focused his presentation on guided surgery in implantology. For *Zwanzig*, the advantages of this treatment method are obvious: computer-supported planning significantly increases precision, dangers for neighboring structures are recognized early on, the operation duration is reduced and, finally, the subsequent prosthetic restoration is increased. How the digital workflow can be integrated into the daily routine of the practice and made cost-efficient is one of the biggest hurdles, but it can be mastered with the right concept.

Dr Frederic Hermann, Zug (Switzerland), connected via video, showed how the fully digital chairside workflow can contribute to optimal implant positioning. The 3D visualisation of the target planning also provides a tool for patient education and documentation, which is associated with maximum time and cost effectiveness of the implantological treatment while minimizing the risk profile in the surgical and prosthetic phase.

When cells die

Professor Fouad Khoury, Olsberg is and remains an advocate of autologous bone when it comes to augmentative measures in the surgical treatment of periimplantitis. With bovine material the "dying effect" is missing, because "when cells die, regeneration is stimulated". However, the surgical therapy of periimplantitis – the subject of his lecture – is only indicated if the first choice of treatment – conservative, non-surgical therapy – is not successful. He showed indications for surgical treatment, pre-treatment, methods of resective or augmentative measures with their differential therapies and materials. In his lecture he made clear that the treatment always involves the decontamination of implant surfaces and ultimately wound care.

When is augmentation indicated?

The scientific director of the Bavarian Dentists' Day, *Professor Joachim Zöller*, was also present as a speaker with the topic "Current surgical concepts for implantation in the atrophied jaw". A successful implantation requires sufficient and vital bone volume. "If it is too small for the insertion of implants, there is an absolute indication for bone augmentation". However, there is a relative indication if functional, esthetic, or other aspects speak against it. He investigated the question of which augmentation method should be used for which degree of atrophy, considering factors such as the patient's constitution, which also depends on the size of the defect. "If at all possible, we use autologous bone in Cologne," he said. He made recommendations for the reconstruction of vital, resorption-stable bone with sufficient volume. In addition, he presented, among other things, his experience with the complex therapy of distraction osteogenesis for the augmentation of vertical bone.

Assistant Professor Jörg Neugebauer

Professor Stefan Fickl

Backward planning

Diagnostics and cooperation between surgeon and prosthetist were the topic of *Assistant Professor Jörg Neugebauer,* Landsberg/Lech. Planning and successful therapy require detailed and coordinated diagnostics and communication between the two. In addition to the two- and three-dimensional radiological techniques, the digital workflow enables the superimposition of CAD/CAM data for the desired prosthetic restoration. "If the surgeon has all relevant information about the patient, the planned therapy can best meet the patient's expectations!" In establishing a functioning workflow, the direct surgical and prosthetic treatment effort could be reduced and thus patient morbidity. This does not mean, however, that the new techniques require less working time, as a learning curve is first necessary to be able to make the best use of the various possibilities.

Hosting the two days in Munich: Christian Berger and Professor Joachim Zöller

Implants in a periodontally compromised dentition?

Professor Stefan Fickl, Fürth dealt with the question of whether severe cases of periodontitis are suitable for implantation. It is often a complex decision between tooth preservation and tooth extraction as well as a possible subsequent implantation. On the one hand, perio patients have a higher risk of biological complications such as periimplantitis. On the other hand, invasive prosthetic measures are not without risk in perio patients. In his presentation he showed a clinical concept for the treatment of a perio patient with a severe course of disease. He advised 2-part implantation, i.e. not simultaneous augmentation, and implantation.

In their opening statements, *Christian Berger* as congress director and *Professor Joachim Zöller* on behalf of the association had thanked everyone who had made the presence event possible during these times with the help of a strict hygiene concept. All participants, speakers and organization teams wore mouth-nose covers throughout, and an ingenious routing and seating arrangement ensured the prescribed distance.

Conclusion:

In order to guarantee the integrity of dental care for the entire population, German dentists must have an opportunity to receive continuing education – whether in the form of online seminars, for example the "BDIZ EDI informs" series, or as physical meetings such as the 2020 Bavarian Dentists' Congress.

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1. Becker J, John G, Becker K, Mainusch S, Diedrichs G, Schwarz F. Clinical performance of two-piece zirconium implants in the posterior mandible and maxilla: a prospective cohort study over 2 years. Clin. Oral Impl. Res. 28, 2017, 29–35 doi: 10.1111/clr.12610

General assembly in Munich

Strong performance in a difficult year

For dentists, the year 2020 was also marked by the corona pandemic. On the occasion of the 61st Bavarian Dentists' Day, which BDIZ EDI helped to organize as a cooperation partner, the executive board provided information at the general assembly in Munich about the work of BDIZ EDI during this period and about the year 2019.

In his report to the general meeting in Munich, BDIZ EDI President *Christian Berger* gave an overview of the year since the 2019 general meeting in Erfurt.

Expert Symposium and EuCC

In 2020, the 15th Experts Symposium took place in Cologne and with it the 15th European Consensus Conference under the auspices of the BDIZ EDI. As every year, the results in the form of the practical guide were sent to the members. In 2020 the topic was: update periimplantitis. It was the last event before the WHO declared the corona pandemic. The board hopes to hold the 16th Expert Symposium in February 2021. Topic: ceramics in implantology.

Dentists during the Corona pandemic

To soften the economic impact of the corona crisis, the German government had put together aid packages worth billions. Despite full-bodied promises by the Federal Ministry of Health, the dentists were left out in the cold. *Berger* said that this was to be unequal treatment and disparagement of dentists in comparison to other health care providers.

The dental practices had been largely spared from closures. Anyway, it had been achieved at the political level that it was not the state that decides on practice closures, but the dentist and his patient who decide whether treatment is necessary during the peak phases of the pandemic.

The BDIZ EDI during the corona pandemic

The BDIZ EDI reacted early. In order to satisfy the members' need for information the board started already at the beginning of March to report daily with breaking news on new developments via the website: Recommendations for action have also been and are regularly posted in the members' area of the internet and in the BDIZ EDI konkret since March. Also in March, the board of directors recommended that members decide on the implementation of dental treatment in each individual case. According to *Berger*, neither a patient nor a dentist nor a dental assistant has been infected in Germany to date while practicing their profession.

As a reaction to the crisis, the BDIZ EDI launched the campaign "Der BDIZ EDI hilft" (The BDIZ EDI helps) with online seminars, which provided regular information from 9 April 2020 concerning law, infection prevention, patient education, but also on emergency aid, short-time work, tax and business management topics that were particularly important for practices during the crisis.

Campaign 1 with seven online events was pursued by the follow-up campaign: "Der BDIZ EDI informiert" (BDIZ EDI informs) starting from July 2020. The second series of further training courses deals with hygiene, sterile TEAM work, update periimplantitis, update digital implantology, and the BDIZ EDI offers online seminars for European members and those willing to undergo further training. The EDI Journal informs in this issue about the topics.

Christian Berger: "BDIZ EDI carries out online training largely with its own resources. I would like to take this opportunity to thank everyone on the board who is involved in this, whether as a speaker or as an organizer in the background or as a moderator: *Stefan Liepe, Wolfgang Neumann, Jörg Neugebauer, Detlef Hildebrand, Freimut Vizethum, Thomas Ratajczak* and *Anita Wuttke*".

Curricula

In October 2020, the 22nd Curriculum Implantology of BDIZ EDI and the University of Cologne was launched. The curriculum is a success story with a total of around 600 participants who have now successfully completed the course and of whom over 80 percent are still members of BDIZ EDI. Every course is fully booked after a short time and there are waiting lists. Due to the high demand, the board is planning to launch another curriculum, the BDIZ EDI president said.

Board members: Dr Renate Tischer, Dr Nathalie Khasin, Dr Jörg Neugebauer and Professor Joachim E. Zöller, Christian Berger, Dr Stefan Liepe and Dr Wolfgang Neumann

Consensus conferences
The BDIZ EDI not only participates in the consensus conferences on implantology, but also sits at the table in the guideline conferences to contribute its expertise to the practice.

Activity around Europe
The 14th Europe Symposium was planned in May 2020 in Skopje in cooperation with EDI Macedonia. Due to the pandemic it did not take place. In 2021 there should be a new attempt. Up-to-date information is available online and in the members' magazine.

IDS 2021
The IDS is to take place in a slimmed-down form. The BDIZ EDI is also registered. It remains to be seen how sustainable the hygiene concept of the organizers will be, said the President.

Internet and social media
The BDIZ EDI relaunched its website in 2020 to make it more user-friendly. In the meantime, the association is not only active on Facebook and Instagram, but also on other social platforms such as Twitter and YouTube.

Executive board
In the ongoing corona crisis, the entire board is showing a lot of commitment and dedication to pass on information and recommendations to the members, said *Berger*. "For this, a heartfelt thank you to *Joachim Zöller*, *Jörg Neugebauer*, *Detlef Hildebrand*, *Stefan Liepe*, *Wolfgang Neumann*, *Freimut Vizethum*, *Renate Tischer*, *Nathalie Khasin* and *Peter Ehrl*.
The BDIZ EDI President addressed his thanks to the employees of the BDIZ EDI: *Brigitte Nötzel* in Cologne, *Helga Karanikas* in Munich, and *Marion Gollmitzer*, who oversees the accounting hotline.

Cooperation and further training
Professor *Joachim E. Zöller* referred in his report to the cooperation of the BDIZ EDI. For the third time, the association is a cooperation partner of the Bavarian Dentists' Day. There is the cooperation with the (state) dental associations during the expert conferences. To achieve this cooperation for the association is the merit of BDIZ EDI President *Christian Berger*.

The curricula of the BDIZ EDI would run very well without major difficulties – even in the pandemic and partly online. It is important to thank *Professor H. J. Nickenig* for the implementation, without whose work the implementation could not be managed.

The 15th Expert Symposium and the 15th European Consensus Conference were held with the support of moderation by *Assistant Professor Jörg Neugebauer* and *Professor H.J. Nickenig* before the outbreak of the corona pandemic in Cologne. The 16th expert symposium is being planned. The program will be prepared by *Assistant Professor Jörg Neugebauer*. Whether the Cologne carnival will take place cannot be predicted at present.

Good media relations
Dr Nathalie Khasin read out the report of the Secretary General, who could not be in Munich. In this report, *Dr Detlef Hildebrand* made it clear that the effort in the media sector is increasing all the time regarding online and guidebooks. He took this opportunity to thank press officer *Anita Wuttke* "for her outstanding work". Looking to the future, the Secretary General provided information on the further development of the social media sector decided on at the strategy meetings of the Board.

Work in the committees
Assistant Professor Jörg Neugebauer pointed out the annual practice guidelines of the BDIZ EDI as well as the strong involvement of the association in guideline projects.

An outlook for the coming year remained vague. It was not yet certain whether the planned events and trade fairs would be carried out, said *Christian Berger* in his concluding statement. *AWU*

The campagne started at the beginning of the corona pandemic will be continued in 2021.

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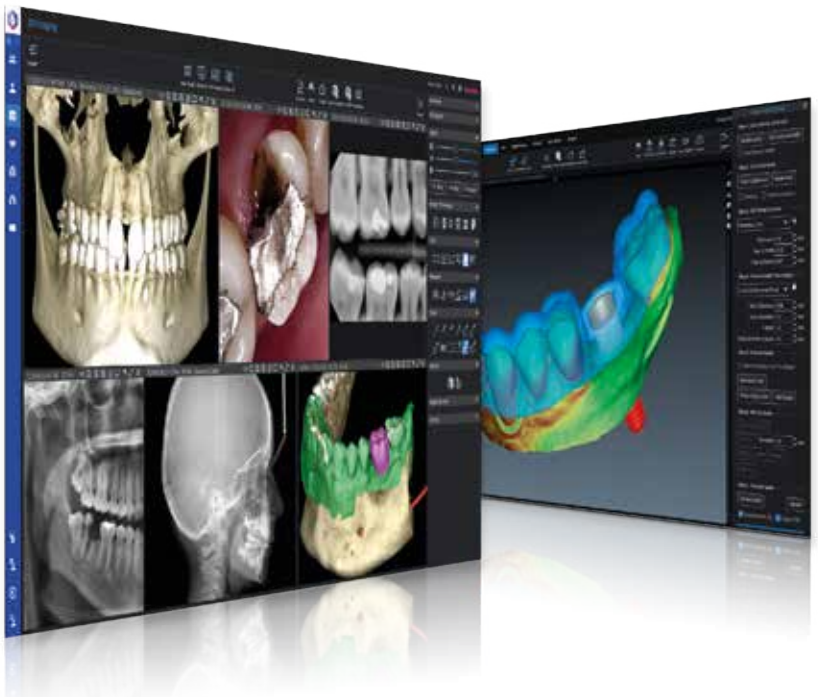

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Exciting insights into stem-cell research with Professor Jürgen Hescheler

Place an implant – or grow a new tooth?

Stem- cell research is an exciting field, especially when it comes to regrowing teeth. Since 2014, the editors of EDI Journal have been in regular contact with Professor Hescheler, who is a stem-cell researcher at the University of Cologne. Having provided an update on the topic in 2017, we are following up on it one more time in this issue.

Professor Jürgen Hescheler

Professor Hescheler, what has been going on in stem-cell research since we last spoke in March 2017? What scientific advances have you made?

We have concentrated strongly on the question of how two translate laboratory research into clinical applications. My main field is cardiology research, especially into heart attacks, and here we have made two important advances. For one, we have transferred our cell cultures – which normally do their work in small bottles – to bioreactors. In other words, we are no longer talking about 1 million cells as in a standard cell culture, but about thousand times as many, 1 billion cells. This is an important prerequisite for further progress, because we need to work with a sufficient number of cells, especially in human research. We were able to transfer the cell culture techniques to the new environment. We can now cultivate cells on a large scale in the bioreactor.

The other area where we have made advances is research cooperation in large-animal experiments– which is unfortunately very difficult in Germany. We have now found a reliable cooperation partner in Spain; we are currently conducting transplantation experiments on large animals and hope to be able to show that the cells that we obtain from the stem cells become functional tissue.

Specifically, in the case of heart attacks, we hope that the heart will beat just as strongly as before the attack and that the scar will heal almost completely. This has already worked in small-animal experiments. Now is the time to make it work in large-animal experiments.

At the moment we are still in the process of implementing GMP, Good Manufacturing Practices, producing cells under clean-room conditions, which is an important prerequisite for any clinical application. This is not one single step but a sequence of steps. It is not an easy task. But we are full of expectation!

What is the status of stem-cell research globally?

There have been very interesting technical advances, especially in the area of basic research, thanks to new methods in genetics. For example, sequencing methods have been immensely improved; here we speak of New or Next Generation Sequencing, NGS. We have become much better at selecting the genes that are important to our development efforts. Too bad this was not invented by our group... But other groups also have a new technique, single-cell sequencing. Which means that if you have well-developed tissue you can identify the genetic signature of virtually every single cell in that tissue and trace how the individual populations develop. This has been achieved for different tissues.

For example, recently there was a very nice article in Nature where this was shown for the skin. The article nicely demonstrated how skin develops from a stem cell and how the different skin appendages – sweat gland, hairs, melanocytes – develop the

various cell populations from the basic cell line. This is important for our understanding.

Internationally, this research has greatly helped improve our differentiation techniques. Previously, developments used to come more randomly. Our invention 30 years ago was the single embryoid body, where we allowed stem cells to develop in an embryonic corpuscle in the same way as in an embryo. This has now been replaced by directed differentiation. Today we know which factors – growth factors, differentiation factors, cytokines – are important for the different developmental steps. In our bioreactor, we have modified the differentiation process so as to develop the cells in several steps, from the stem cell to the early progenitor cell to the finished tissue cell. This has made differentiation much more reliable ... So that is what has been happening globally.

This is now your work as well, on an international level?

We are involved to some extent. The single-cell method demands a technology that is relatively complex and expensive and that we unfortunately do not have deployed in Cologne. At least we can benefit from the data. For our own research, it is useful that we know the growth factors that drive differentiation. Returning to the topic of cardiac cells for a moment, we can develop those from pluripotent cells in a two-step process. The first step creates the mesodermal cell type – the precursor cell, so to speak – and a second signal can then be used to convert all those cells into cardiac cells.

Directed differentiation is really a valuable improvement, especially when it comes to human cells. Differentiation protocols did not used to be this efficient. A lot of work has been done on this internationally, and improvement has been considerable. This can be seen in the results that are now being discussed in the stem-cell research community, and also in current publications.

If you ask what has improved globally, I would point out the analytical part. We now know much better how the tissues develop normally in the embryo. Secondly, we can make differentiation much more targeted and faster and develop highly specialized cells.

And thirdly, to pick up where we left off – and this was actually clear from the very beginning when looking at tooth tissue differentiation – we now know that teeth are made of two basic cell types. This has also been confirmed for other organs. We can develop organ-like structures, the so-called organoids. And we are trying to find out which cell types are important for the development of an entire organ. In general, we first had a reductionistic phase, where we tried to understand how a single cell works. Now, in the second step, the synthesis, the composition is at issue. So the question is, if we have a lot of cells, how do the tissues organize themselves? How do the cells interact with each other?

What does the microenvironment around the cell look like, and how can you obtain functional tissue?

In our 2017 interview you talked about the so-called organoids encompassing several cell types that work together in the organ. That question has already been answered. Or do you have anything to add?

In principle, the question has been answered. We have multiple areas that we focus on. For example, there has been some very spectacular work in the neurological area. In laboratory slang, we are talking about the "mini-brain". It is actually possible to reproduce cortical structures of the brain. We ourselves are involved in a collaboration where we have developed eye cells – not eyes yet, but functional ocular cells that are sensitive to light.

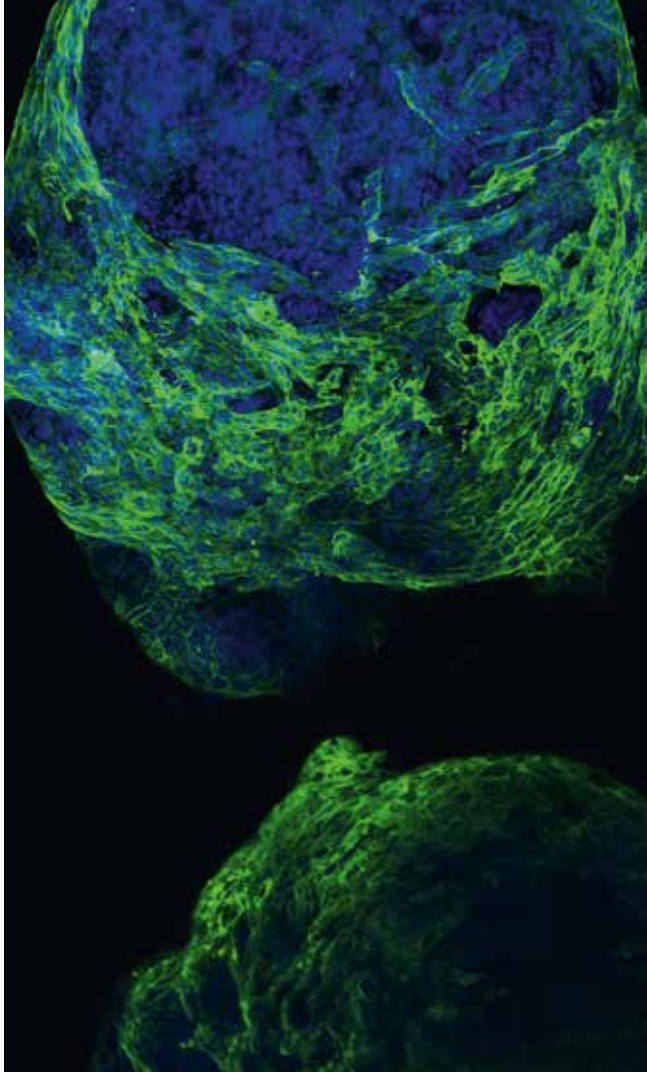
In general, we have found that if the cells remain in the cell culture a little longer, this will result in higher levels of differentiation. This is another exciting trend towards the development of organoids, a way to develop organ-like structures with much better function.

Growing teeth from pluripotent stem cells was the topic of our last interview. You had said that the research community was moving from basic research to clinical application. That was in 2017. What is the current state of affairs with regard to regrowing teeth?

The number of studies in this field is growing explosively. I performed a literature search ahead of this interview. There has been almost exponential growth in the number of publications. Since 2017, we have seen many more working groups become interested in the topic.

On the other hand, what I said at the time is still valid: unfortunately, there are still no clinical results that have been published. I would have loved to be able to report on the first clinical application. But as things stand, the situation is similar to that in cardiology. In small-animal experiments, with mice or rats, there have been some very successful studies showing that it is really possible to grow teeth. I had said at that time that the process starts with a tooth germ, which develops from two basic cells. This process creates some really interesting teeth... We now have more information about what is needed to get an incisor in the right place, or a molar. That is also something that seems to be well under control.

We are currently in the phase of starting the large-animal experiments. The subsequent steps are, of course, similar to those for all other organs. Unfortunately, there has not been that much progress in this area – not in the production of the tooth germs under highly sterile conditions, which is important



Embryoid bodies (EBs) are three-dimensional aggregates of pluripotent stem cells.

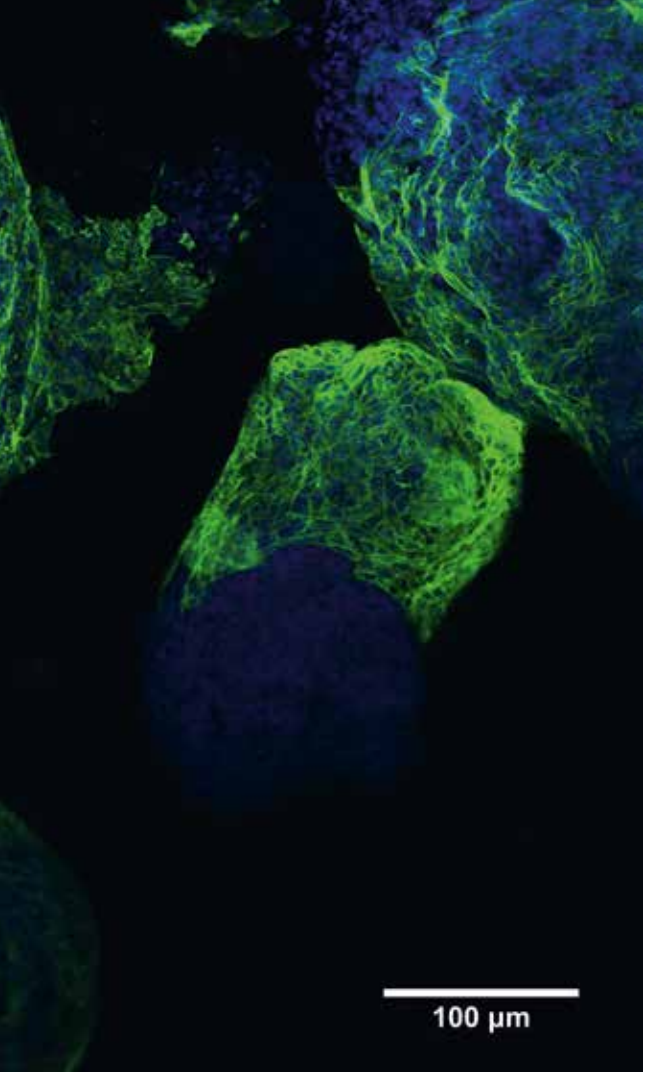
if the procedure is to be used on patients, and not in the realm of clinical studies. I cannot report any breakthrough here.

But perhaps you can make a prediction of when serial production could be achieved?

The global coronavirus pandemic has unfortunately resulted in a global setback. Our institute, like many others, has carried out no major experiments for almost a year. Research is handicraft, and if you cannot work in your lab because of the lockdown, you are not going to go anywhere. This is not only true for Germany; it is a worldwide problem.

In principle, it will take two years before the large-animal experiments can begin, and then another two to three years before initial production. I had mentioned GMP. This is an issue beyond the purely scientific ones. If you asked me whether our scientific research has been more or less completed, I would reply in the affirmative. We can do it, or to put it more clearly: yes, we can grow teeth.

But: prior to any clinical application, many formal hurdles have to be overcome, and in the end, there are also all those legal questions, such as how to treat stem cells. Unfortunately, the European Commission has stipulated that the procedure must be evaluated in accordance with the German Medicines



Act. This means that we would have to do a lot more preliminary testing before proceeding to clinical applications and demonstrate their safety.

At the moment there is a discussion going on among stem-cell researchers as to whether the regrowing of teeth will ever become a clinical procedure, given the immense obstacles. The question is whether regrown teeth should not rather be treated like implants, that is, more like biomaterials. As always, there are arguments for and against. The regulatory authorities of course are looking at this very closely: unfortunately, the authorities here in Germany are rather reluctant in this area. Hurdles are set higher than in other countries, and this of course results in delays on that end.

What role does the EU Medical Device Regulation play here?

A big one. Regulatory approval has generally become more difficult to obtain. The hurdles have risen due to new, more demanding security rules. On the one hand this is of course a good thing; if you want to introduce a new treatment, you want to be one hundred percent sure that it works. Unfortunately, we have been burned by the gyrations surrounding gene therapy. At that time, initial enthusiasm quickly shifted the focus to patient studies, with the result that there were several deaths caused by the transport virus for the gene developing differently in humans than in the animal experiments. The need for patient safety and the desire to speed up clinical application are not easy to reconcile.

According to your estimate, a regrown tooth – disregarding development costs and license fees for a moment – will cost between 100 and 500 euros. So that would make it competitive with any implant solution?

Yes, as far as the production process is concerned. The cells are relatively easy to develop. The cell culture systems could be created relatively simply, and these would be a precondition for the tooth germ. As I said, you have to bring two types of stem cells together – an ectodermal and a mesodermal cell type. This causes the germ to develop. This germ would then be inserted into the socket where the natural tooth was previously extracted, and the tooth would grow back accordingly. I would still stick to this cost estimate as far as developing the tooth germ. Meanwhile, however, it has been proposed that the tooth germ could be further cultivated in the cell culture to produce the complete tooth.

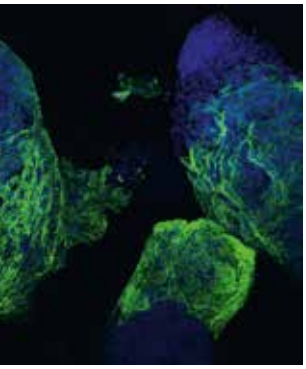
Would the implantation of tooth germs or fully regrown teeth be a future task for oral implantologists? Or in other words: Can every dentist theoretically work with the regrowing or regrown tooth, or does this require some special knowledge?

I would imagine that following an introductory period, any regular dentist could employ the procedure. In an initial phase, however, cell-culture experts would be needed. In the following phase, specialist service providers could refine the process. To prevent the future tooth from being rejected, it would be necessary to harvest cells from the patients themselves, which would then be reprogrammed to return to a pluripotent state. The germs could then be grown from these cells.

I believe that either the implantation of the germ or the implantation of a developed tooth could be performed by the dentist. Of course, the hygienic preconditions are important. The procedure must be performed under sterile conditions. But the process itself is the same as in animal experiments: the tooth germ is simply inserted into the socket. This procedure is not that special, I am sure it could be performed using standard surgical techniques.

What innovations can we expect from stem-cell research in future?

Some areas where interesting things are happening include tumours, and more recently of course virus infections. Pluripotent cells can also develop



from the haematopoietic system, from the blood. Population- genetic studies have shown relatively clearly how the individual cell types develop. Thus, it is exciting to differentiate cytotoxic T cells and B cells. T cells destroy diseased cells, such as virus-infected cells or tumour cells. B cells are responsible for the production of antibodies.

One idea has been to develop a cell population from iPS cells outside of the human organism that reproduces this hematopoietic differentiation and that can improve, so to speak, the immune system right in the cell culture. Especially in the context of COVID-19, another idea has been to use antibody-producing cells to generate optimized antiviral antibodies, generating such antibodies by way of cell therapy instead of vaccination.

But we are still a long way from there?

These are just ideas at the moment, but many colleagues within stem-cell research have now increasingly become interested in this type of differentiation. Especially in the area of tumour development, it is of course also very exciting to try and produce the corresponding T cells that can specifically attack the tumours. That would be a true breakthrough in tumour therapy.

In our field we have concentrated more on organ cells that compensate for organ defects, such as myocardial infarction or degenerative disease. These are innovative ideas: developing additional cells that improve our immune system, maybe even in the direction of "human enhancement", by improving our own defence system and finally getting a grip on viruses and tumours.

Then there are also interesting anti-aging considerations. There is increasing evidence that an important aspect of the aging process is that the pool of stem cells available for the regeneration of organs in our body decreases with age. A colleague of mine from Heidelberg has done some nice work on the haematopoietic system, stating that even the quality of these stem cells decreases. There have been discussions about how to develop pluripotent stem cells induced by this reprogramming technique in order to replenish this pool of stem cells in our body. This is a question about the regeneration of organs in general.

Finally, the inevitable question about your wish list: What do you expect from politicians in Germany/ Europe?

Research is done by people, and people must be paid. And unfortunately, I have to say that both at national and EU levels, the funding for stem-cell technology has declined. It has become more difficult to obtain funds. There was a "hype phase" when we were relatively well financed; then, when success gradually materialized, these efforts were running out of steam, and the funds were diverted to other projects.

I would like to have bigger programs and I think it is also important to improve networking. Many stem- cell researchers are still lone wolves. It would be better to create better structures more conducive to exchange knowledge, so that we can make faster progress together.

My second wish would be for the regulatory authorities to de-complicate things so that the research process can proceed to clinical trials faster and more easily. Politicians should also support this.

The laboratory situation is also unsatisfactory, because although university laboratories give birth to interesting ideas, it is difficult for these institutions to proceed to clinical applications.

Research institutions such as the German Research Foundation think our lines of research are not basic enough. On the other hand, the industry is turning a cold shoulder because the product is not yet mature enough for them. So here we still have a gap that needs to be bridged. How do I get from laboratory research to the finished product? Unfortunately, there is really no one in Germany who feels responsible for this. Securing for funds for a clinical study becomes increasingly difficult as the German Research Foundation expects basic research, while the German Ministry of Education and Research only provides specific funds for specific research. Hence there is little money for clinical studies. And nobody feels responsible.

So, Professor Hescheler, the same thing as three years ago, and five years ago ...

... yes, unfortunately not that much has changed since then, although I have held minutes presentations, including to politicians, and outlined the problem, again and again. But it will be a long and tedious process until anything at all changes!

Thank you, Professor Hescheler, for these interesting insights into the state of stem-cell research.

Interview by Editor-in-Chief *Anita Wuttke*

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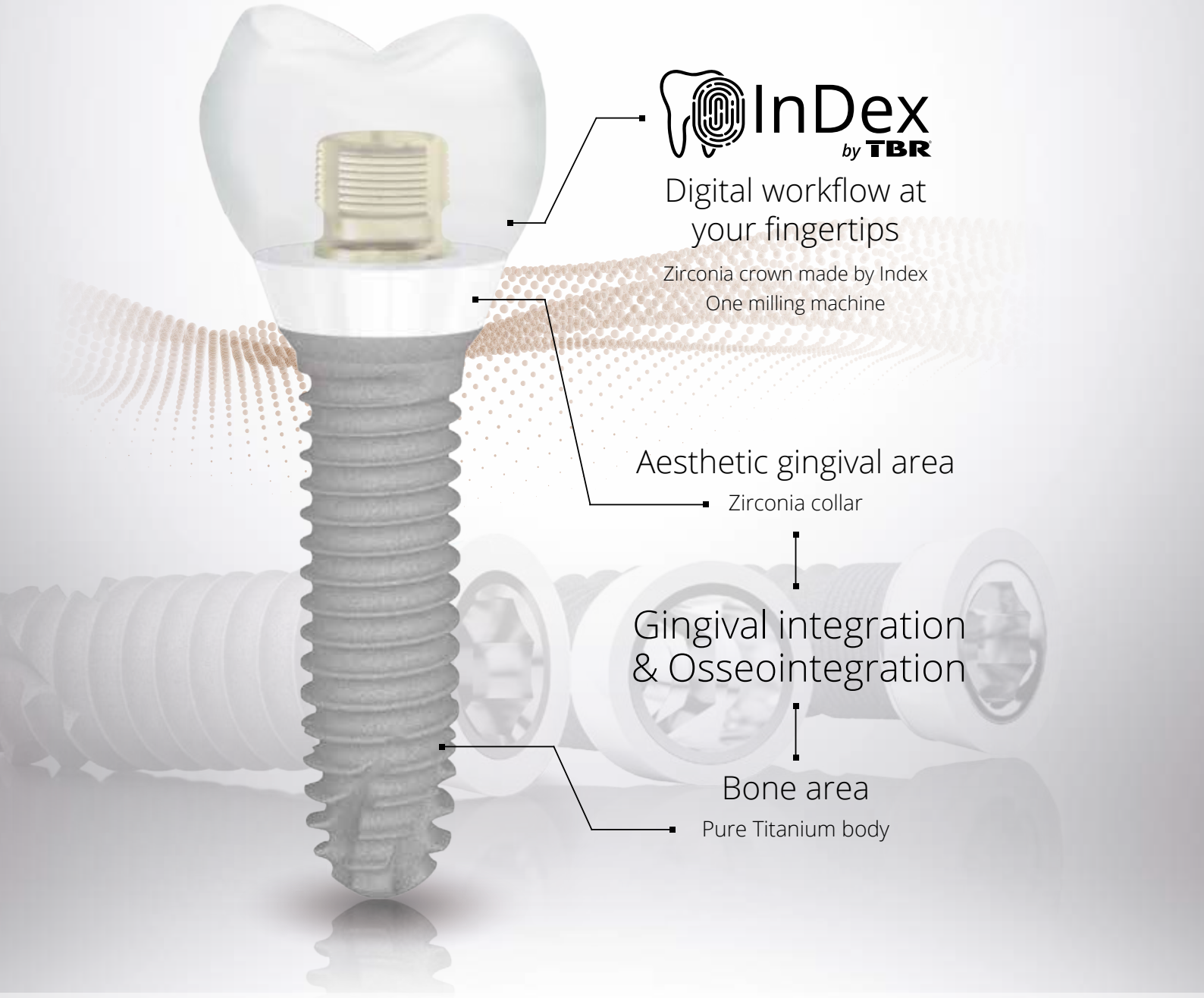

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Dental workforce, Brexit and COVID-19 pandemic

"Perfect storm" in 2021


Photo: ©shocky - stock.adobe.com

The British dental industry is facing an impending recruitment "crisis", with Brexit uncertainty and the COVID-19 pandemic choking the supply of overseas dentists to the UK, the industry's trade body has warned. The industry has told MPs that uncertainty over the UK's new immigration system and the long-term validity of European Economic Area (EEA) qualifications after Brexit, coupled with a backlog of up to 15m missed dental appointments caused by the coronavirus crisis, was creating a "perfect storm" in some areas of the UK.

Neil Carmichael, chair of the Association of Dental Groups which represents major national providers including MyDentist and Bupa, said the government needed to take urgent action to continue to make the UK attractive to dentists from the European Economic Area. "The dental workforce is set to face a crisis in 2021 as overseas recruitment could dry up. As mutual recognition [of qualifications] and freedom of movement fall away at the end of the [Brexit] transition period, the UK could look a much less attractive place for EEA dentists to practice," he said. The ending of free movement of people when the Brexit transition period expires on December 31 is expected to put pressure on the healthcare industry more broadly, with the government last week refusing to ease recruitment rules for skilled workers such as care home managers.

17 per cent from European Economic Area

Dentists from the EEA currently make up 17 per cent of all registered UK dentists but in some more deprived parts of the UK up to 30 per cent of NHS dentists are drawn from Europe, notably Poland, Spain and Romania. *Gabriela Pueyo*, general manager at Bupa Dental Care said that recruitment was particularly hard in rural areas, such as Devon and Cornwall, where this year it was taking an average of 162 days to fill vacancies. "With ongoing challenges, Brexit has added to the scale of the skills shortage. Hiring EU candidates is set to become even more difficult for the sector if recognition of EU titles is not maintained," she added. The total value of the dental industry is estimated at around £6bn a year by the ADG, of which two-thirds is spent by the government and one-third via private dentistry.

Figures from the General Dental Council show that the number of new EEA dentists registering in the UK has been falling over the past decade, before the vote from 970 in 2011 to just 398 in 2019. However, the total number of registered EEA dentists in the UK has remained stable at 6,800, suggesting fewer dentists from Europe have been leaving the UK over this time. In a briefing note circulated to MPs earlier this month, the ADG called on the government to double the number of places at UK universities for British dentists from current levels which it said are capped at 800 places annually. It also wants the government to legislate to recognise EU qualifications in the UK for at least five years after January 1 next year, taking into account the length of time it takes to qualify a dentist.

Recommended UK immigration Home Office rejects easing of health recruitment rules. It has also proposed that the General Dental Council (GDC) recognised qualifications from high-performing non-EEA dental schools in countries like India, which has a surfeit of dentists, and make it easier for those dentists to register to practice in the UK. Currently, non-EEA dentists must pass the stringent Overseas Registration Examination which offers only 500 places a year and takes 18 months to complete and has a pass rate of less than 50 per cent. This year the exams were cancelled because of COVID-19, further reducing the recruitment of new dentists. The ADG has urged the government to support the expansion of the exam to cover 1,500 places. The General Dental Council said that the UK would continue to automatically recognise EEA qualifications for two years after Brexit while a new regime is worked out, but that the government would need to pass legislation to enable it to reform the exams and extend recognition of EEA qualifications.

Sophia Wolpers, Brexit director at London First, a network of business leaders who promote the capi-

tal's interests, said failure to prioritise the EU mutual recognition of professional qualifications would make it harder for many businesses to deliver services. "A framework agreement is needed to make recognition easier: we rely on high-skilled talent across our services professions, and the government should do all it can to ensure the UK is an attractive destination for these workers," she said. The Department of Health and Social Care said that it was committed to addressing staffing shortages and that it had launched a Health and Care Visa to encourage more overseas doctors and dentists to come and work in the NHS. "Work is taking place to explore additional opportunities for dental training, improve staff retention and find flexible and effective ways to ensure we have sufficient staff with the necessary skills and experience," a spokesperson added.

Author: Peter Foster

By courtesy of the Financial Times

Europe Ticker +++

Court of Justice of the EU: Taxation

EU-Commission files claim against Poland

The European Commission decided to refer Poland to the Court of Justice of the European Union because of its failure to align with EU rules on the exemption of imported alcohol used in the production of medicines.

Photo: Von EmD–Eigenes Werk, CC BY-SA 4.0, https://commons.wikimedia.org/w/index.php?curid=91781296

EU excise duty rules provide for a mandatory exemption from excise duty for imports of ethyl alcohol used in the production of medicines. Polish national practices, however, do not grant this mandatory exemption when the alcohol importers do not choose to use a duty suspension arrangement.

This is because Polish rules do not provide for refunding excise duty paid on the import of ethyl alcohol used to produce medicines after the duty has been paid.

This practice runs against provisions of EU law on the harmonisation of the structures of excise duties on alcohol and alcoholic beverages and the principle of proportionality (Directive 92/83/EEC).

Source: Press release by EU-Commission

University of Birmingham

Spray for treating blisters

A new spray for treating severely painful blisters, mouth ulceration and oral scarring in patients with a rare genetic skin condition is being developed by researchers at the University of Birmingham. The spray is designed for patients with Epidermolysis

Europe Ticker +++

bullosa (EB), a condition that causes the skin to blister and tear at the slightest touch. Around 5,000 people in the UK are currently living with EB, which is usually diagnosed in early childhood. Symptoms include open wounds and sores where fragile skin is damaged and severe scarring where wounds heal. EB can be particularly painful when internal linings such as inside the mouth are damaged, making eating and teeth brushing extremely difficult. Scarring inside the mouth can also affect the development of muscles and other tissue. Researchers in the University's Healthcare Technologies Institute and the Institute of Inflammation and Ageing are working alongside experts in dermatology and dentistry to formulate an oral spray designed to alleviate some of these symptoms. Over the next two years, the team will work closely with clinicians and patient groups to design the spray so that it can be delivered directly into the cheek cavity. It will contain anti-fibrotic molecules to both treat the blisters and prevent them from scarring.

Source: Medical Express

European Leaders

Measures to limit the spread of COVID-19

By end of October, the European Commission has launched an additional set of actions to help limit the spread of the corona virus, save lives and strengthen the internal market's resilience. Concretely, the measures aim to better understand the virus' spread and the effectiveness of the response, ramp up well-targeted testing, bolster contact tracing, improve preparations for vaccination campaigns, and maintain access to essential supplies such as vaccination equipment, while keeping all goods moving in the single market and facilitating safe travel. This comes

Illustration: Foxstudio - stock.adobe.com

Illustration: geralt/pixabay.com

ahead of the European Leaders' virtual meeting on 29 October on COVID-19 coordination, following the 15 October European Council. Even though Member States are better prepared and more coordinated than in the early months of the pandemic, citizens, families and communities across Europe continue to face an unprecedented risk to their health and well-being.

Source: EU Commission

Digital Services Act

Protection against illegal content

The EU is working on a Digital Services Act to shape the rapidly developing digital economy at EU level and set standards for the rest of the world. One of the fundamental issues that MEPs want it to address is protecting users against harmful or illegal content. Read on to find out about what Parliament proposes in three reports adopted on 20 October. Parliament wants a clear distinction to be made between illegal and harmful content. Some types of content, for example Holocaust denial, may be illegal in some member states, but not in others. Harmful content, such as hate speech and disinformation, is not always illegal. A strict distinction is needed, as the two types of content require different approaches: illegal content should be removed, while harmful content could be tackled in other ways. MEPs say voluntary action by platform is not enough. They want clear, EU-wide rules for content moderation, applying the so-called notice and action mechanism. MEPs want the final decision on the legality of user-generated content to be taken by an independent judiciary, not private commercial entities.

Source: European Parliament

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The brochure can be downloaded online for free: https://bdizedi.org/en/quality-guidelines/

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... gives a glimpse of the COVID-19-situation in European countries in every issue? Starting with the first wave in February/March through the summer months and giving an update from the start of the second wave.

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European Court of Justice: Maximilian Schrems vs. Facebook

ECJ invalidates EU-US Data Protection Shield

The Court of Justice invalidated decision 2016/1250 on the adequacy of the protection provided by the EU-US Data Protection Shield in June 2020. However, it considers that Commission decision 2010/87 on standard contractual clauses for the transfer of personal data to processors established in third countries is valid.

The General Data Protection Regulation ('the GDPR') provides that the transfer of such data to a third country may, in principle, take place only if the third country in question ensures an adequate level of data protection. According to the GDPR, the Commission may find that a third country ensures, by reason of its domestic law or its international commitments, an adequate level of protection.

In the absence of an adequacy decision, such transfer may take place only if the personal data exporter established in the EU has provided appropriate safeguards, which may arise, in particular, from standard data protection clauses adopted by the Commission, and if data subjects have enforceable rights and effective legal remedies. Furthermore, the GDPR details the conditions under which such a transfer may take place in the absence of an adequacy decision or appropriate safeguards.

The case

Maximilian Schrems, an Austrian national residing in Austria, has been a Facebook user since 2008. As in the case of other users residing in the European Union, some or all of *Mr Schrems's* personal data is transferred by Facebook Ireland to servers belonging to Facebook Inc. that are located in the United States, where it undergoes processing. *Mr Schrems* lodged a complaint with the Irish supervisory authority seeking, in essence, to prohibit those transfers. He claimed that the law and practices in the United States do not offer sufficient protection against access by the public authorities to the data transferred to that country. That complaint was rejected on the ground, inter alia, that, in decision 2000/5205 ('the Safe Harbour Decision'), the Commission had found that the United States ensured an adequate level of protection. In a judgment delivered on 6 October 2015, the Court of Justice, before which the High Court (Ireland) had referred questions for a preliminary ruling, declared that decision invalid ('the *Schrems* I judgment').

Following the *Schrems* judgment and the subsequent annulment by the referring court of the decision rejecting *Mr Schrems's* complaint, the Irish supervisory authority asked *Mr Schrems* to reformulate his complaint in the light of the declaration by the court that decision 2000/520 was invalid. In his reformulated complaint, *Mr Schrems* claims that the United States does not offer sufficient protection of data transferred to that country. He seeks the suspension or prohibition of future transfers of his personal data from the EU to the United States, which Facebook Ireland now carries out pursuant to the standard data protection clauses set out in the Annex to decision.

Taking the view that the outcome of *Mr Schrems's* complaint depends, in particular, on the validity of Decision 2010/87, the Irish supervisory authority brought proceedings before the High Court in order for it to refer questions to the Court of Justice for a preliminary ruling. After the initiation of those proceedings, the Commission adopted decision 2016/1250 on the adequacy of the protection provided by the EU-U.S. Privacy Shield ('the Privacy Shield Decision').

By its request for a preliminary ruling, the referring court asks the Court of Justice whether the GDPR applies to transfers of personal data pursuant to the standard data protection clauses in decision 2010/87, what level of protection is required by the GDPR in connection with such a transfer, and what obligations are incumbent on supervisory authorities in those circumstances. The High Court also raises the question of the validity both of decision 2010/87 and of decision 2016/1250.

Charter of Fundamental Rights affected

In the judgment, the Court of Justice finds that examination of decision 2010/87 in the light of the Charter of Fundamental Rights has disclosed nothing to affect the validity of that decision. However, the Court declares decision 2016/1250 invalid.

The Court considers, first of all, that EU law, and in particular the GDPR, applies to the transfer of personal data for commercial purposes by an economic operator established in a member state to another economic operator established in a third country, even if, at the time of that transfer or thereafter, that data may be processed by the authorities of the third country in question for the purposes of public security, defence and state security. The Court adds that this type of data processing by the authorities of a third country cannot preclude such a transfer from the scope of the GDPR.

Regarding the level of protection required in respect of such a transfer, the Court holds that the requirements laid down for such purposes by the GDPR concerning appropriate safeguards, enforceable rights and effective legal remedies must be interpreted as meaning that data subjects whose personal data are transferred to a third country pursuant to standard data protection clauses must be afforded a level of protection essentially equivalent to that guaranteed within the EU by the GDPR, read in the light of the Charter. In those circumstances, the Court specifies that the assessment of that level of protection must take into consideration both the contractual clauses agreed between the data exporter established in the EU and the recipient of the transfer established in the third country concerned and, as regards any access by the public authorities of that third country to the data transferred, the relevant aspects of the legal system of that third country.

Third country compliance

Regarding the supervisory authorities' obligations in connection with such a transfer, the Court holds that, unless there is a valid Commission adequacy decision, those competent supervisory authorities are required to suspend or prohibit a transfer of personal data to a third country where they take the view, in the light of all the circumstances of that transfer, that the standard data protection clauses are not or cannot be complied with in that country and that the protection of the data transferred that is required by EU law cannot be ensured by other means, where the data exporter established in the EU has not itself suspended or put an end to such a transfer.

Next, the Court examines the validity of decision 2010/87. The Court considers that the validity of that decision is not called into question by the mere fact that the standard data protection clauses in that decision do not, given that they are contractual in nature, bind the authorities of the third country to which data may be transferred.

Lastly, the Court examines the validity of Decision 2016/1250 in the light of the requirements arising from the GDPR, read in the light of the provisions of the Charter guaranteeing respect for private and family life, personal data protection and the right to effective judicial protection. In that regard, the Court notes that that decision enshrines the position, as did Decision 2000/520, that the requirements of US national security, public interest and law enforcement have primacy, thus condoning interference with the fundamental rights of persons whose data are transferred to that third country. In the view of the Court, the limitations on the protection of personal data arising from the domestic law of the United States on the access and use by US public authorities of such data transferred from the European Union to that third country, which the Commission assessed in Decision 2016/1250, are not circumscribed in a way that satisfies requirements that are essentially equivalent to those required under EU law, by the principle of proportionality, in so far as the surveillance programmes based on those provisions are not limited to what is strictly necessary. On the basis of the findings made in that decision, the Court pointed out that, in respect of certain surveillance programmes, those provisions do not indicate any limitations on the power they confer to implement those programmes, or the existence of guarantees for potentially targeted non-US persons. The Court adds that, although those provisions lay down requirements with which the US authorities must comply when implementing the surveillance programmes in question, the provisions do not grant data subjects actionable rights before the courts against the US authorities.

As regards the requirement of judicial protection, the Court holds that, contrary to the view taken by the Commission in Decision 2016/1250, the Ombudsperson mechanism referred to in that decision does not provide data subjects with any cause of action before a body which offers guarantees substantially equivalent to those required by EU law, such as to ensure both the independence of the Ombudsperson provided for by that mechanism and the existence of rules empowering the Ombudsperson to adopt decisions that are binding on the US intelligence services. On all those grounds, the Court declares Decision 2016/1250 invalid.

Source: Press release of the ECJ

Retrospective monocentric study

One-year clinical experience with Progressive-Line implants

Implants are now firmly established in dentistry with high success rates. The trend in patient perception is shifting towards minimally invasive procedures, shorter healing times, simultaneous augmentation, immediate loading and immediate placement. The following study shows that the Progressive-Line implants investigated are well suited for shortened treatment protocols or minimally invasive treatment. This made it possible to implant simultaneously with all sinus floor augmentation procedures, even if the residual bone height was greatly reduced. With an average torque of above 30 Ncm, immediate restoration is possible in many cases with D3 and D4 bone or with reduced bone supply. The flexible drilling protocol also makes the implants suitable for D1 and D2 bone, making the system a clinically universal one.

Introduction

Dental implantology has made continuous progress over the last 20 years. Today, success rates of 95 %–99 % are standard thanks to advanced implant design and surgical techniques [*1*]. A comprehensive meta-analysis evaluating 23 publications covering a total of 7,711 implants found an average implant survival rate of 94.6 % over 13.4 years [*2*]. Now that the high success rate has been accepted as given, emphasis has shifted to more efficient and faster, minimally invasive surgical techniques in addition to functionality and long-term stability.

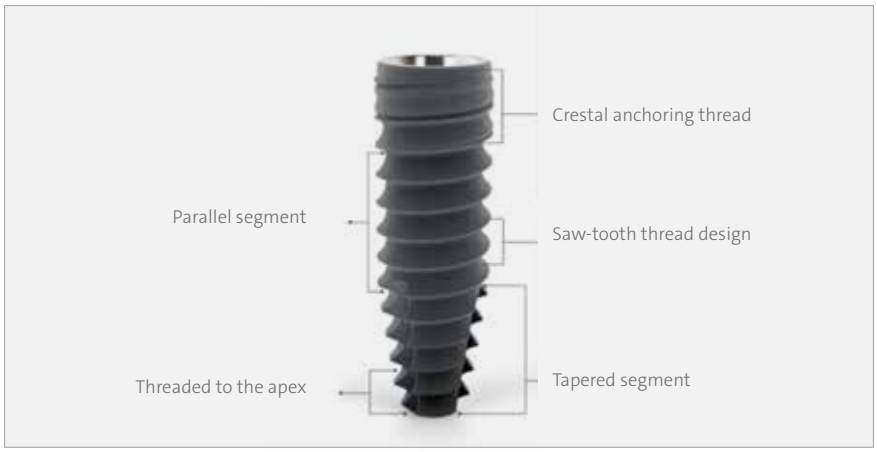
Provided that the indications and limitations of such techniques are well understood, the success rates are just as high as with conventional techniques [*3, 4*]. Here a distinction is made between immediate, delayed, and late implant placement. This classification refers to the time of implant insertion. Immediate placement is defined as insertion of the implant immediately after extraction into the unhealed extraction socket. Delayed placement is defined as insertion of the implant 4 to 6 weeks after the extraction; the gingiva will have healed over the socket at that time, but bony regeneration will not yet be complete. Three months after extraction, the healing processes in both soft tissue and bone will be completed, and implant insertion performed at that point is considered late placement.

Another classification is that by loading protocol, where we must differentiate between immediate and delayed loading. Immediately loaded implants are loaded before complete osseointegration, which occurs on average 12 weeks after implant placement; usually the loading takes place immediately after implant placement. There are concepts with reduced occlusal forces (usually for single crowns) or full loading ab initio (usually designs with primary splinting involving fixed or removable multi-unit dental prostheses). Primary stability, i.e. the strength the implant derives solely from the anchoring of the implant thread within the bone, plays a determining role. The primary stability is usually measured by the insertion torque (in Ncm) or by resonance frequency analysis, RFA (in ISQ values). For immediate loading, ISQ values of > 65 and insertion torques of > 25 Ncm are recommended [*5*]. Immediate implant placement and immediate restoration are therefore two terms that must be fundamentally separated. There are four different implantation protocols:

1. Immediate placement, immediate loading
2. Immediate placement, delayed loading (8–12 weeks after placement)
3. Late placement, immediate loading
4. Late placement, delayed loading (8–12 weeks after placement)

Unfortunately, the scientific literature often does not consider the different protocols separately, so that the study situation is very heterogeneous. In a retrospective analysis [*3*], found a two-year survival rate for immediately placed implants of 98.4 %. A recent comprehensive meta-analysis included 69 studies of protocols 1 to 3 (see above) and demonstrated implant survival rates of 96 %–100 % [*4*]. Basically, and within their indication limits, the survival rates of the different implant placement protocols are very high and do not differ significantly.

Since the primary stability of an implant depends crucially on its surface design, implant systems are now available that have been specially developed for immediate implant placement and restoration. The Progressive-Line implant used in this study (Camlog, Wimsheim,



1 I Macrodesign of the camlog/conelog Progressive Line implant

Number of implants placed per patient	
n	**%**
1 implant	22 (30.6)
2 implants	29 (40.3)
3 implants	14 (19.4)
4 implants	3 (4.2)
6 implants	2 (2.8)
8 implants	1 (1.4)
12 implants	1 (1.4)

Table 1 I Number of implants placed per patient

0	13	25	9	10	4	4	3	1	4	5	12	7	27	16	0
18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38
0	0	4	1	3	2	1	0	0	1	2	4	1	4	3	0

Table 2 I Implant position distribution

Germany) represents this new type of implant design. A combination of several properties optimizes the implant for immediate implant placement and restoration (Fig. 1).

The camlog Progressive-Line implant is a titanium implant with an SLA surface. The SLA coating extends to 0.4 mm below the polished implant neck, making it an RTT (rough-to-the-top) implant. The conelog implant has a conically shaped apical area. The crestal thread on the implant neck is intended to improve primary stability in cases with simultaneous implantation plus sinus lift and low residual bone height. The so-called saw-tooth thread is designed to increase primary stability in softer bone (classes 3 and 4 according to *Lekholm* and *Zarb*). The tapered implant apex with continuous thread to the end is designed to improve anchorage to the bottom of the alveolar socket in immediate implant placement. The manufacturer expects the parallel-walled central region of the implant to provide greater flexibility in vertical implant positioning and a linear increase in insertion torques.

Materials and methods

Between November 2018 and January 2020, a total of 72 patients were treated with 166 implants. Their mean age was 58.4 ± 13.9 years; the distribution per sex was balanced (male, 48 %; female, 52%). Both smokers and non-smokers were included in the study (12.5 % : 87.5 %). All implants were evaluated descriptively for bone quality, number, dimension, and position, augmentation (sinus lift, block augmentation), time of implant placement (immediate, delayed), and loading type of restoration, and implant survival rate.

A different number of implants was placed per patient (Table 1).

Of the implants, 140 were placed in the maxilla, primarily in the premolar and molar regions; 26 implants were placed in the mandible (Table 2).

All implants achieved primary stability. The average torque achieved was 31.6 ± 5.4 Ncm (15–40). To avoid possible complications due to excessive bone compression, the torque was reduced to 40 Ncm in cases with even higher insertion torques by alternating right-left rotations of the implant or by using the Dense Bone drill or taps (Table 3).

Seven implants were placed immediately after extraction and immediately restored, while the majority (159 implants) were placed in healed bone (late implant placement) and prosthetically restored only after an average healing time of 12 weeks. Among all implants, 66 were allowed to heal transgingivally and 100 implants by submerged healing.

		Frequency	Percent	Valid Percent
Valid	D1	3	1.8	1.8
	D2	46	27.7	28.0
	D3	70	42.2	42.7
	D4	45	27.1	27.4
	Total	164	98.8	100.0
Missing	System	2	1.2	
Total		166	100.0	

Table 3 I Bone density

The most frequently performed augmentation procedure was the internal sinus lift according to Summers. It was used with 125 implants. If the residual bone height was less than 5 mm, an external sinus lift was selected (Table 4). This was the case with 24 implants. In all cases, implantation was possible simultaneously with the external sinus lift; the lowest measured residual bone height was 2.4 mm. Even in this case, the inserted implant exhibited primary stability. Submerged healing was chosen for all 24 implants in this group, with site re-entry performed after an average of 12 weeks. A mixture of autologous bone and bovine bone replacement material was used as a graft. Autologous block augmentation was required for 35 implants. In the vast majority of cases (n = 33), implants were placed simultaneously; in 2 cases, a healing period of 3 months was prescribed for bone augmentation before implant placement.

After an average of 12 weeks, the implants were clinically and radiologically checked for osseointegration, and the submerged healed implants were exposed. The patients were then sent back to the referring dentists for restorative treatment. The vast majority of patients (92 %) received fixed crowns and bridges; 8 % of cases were fitted with removable restorations. At the end of the observation period, 103 implants had been restored; 63 implants had not yet been exposed or had not yet received a restoration.

Type of augmentation	n	%
Sinus, internal, single-stage	95	61.3
Sinus, external, single-stage	22	14.2
Block, single-stage	4	2.6
Sinus, external, single-stage; block, single-stage	2	1.3
Sinus, internal, single-stage; block, single-stage	27	17.4
Sinus, internal, single-stage; connective-tissue graft	3	1.9
Block, two-stage	2	1.3

Table 4 I Augmentation/Sinus floor elevation (sinus lift)

There was no case of implant loss during the study period; the implant survival rate was 100 %.

We have chosen a clinical case as an example:

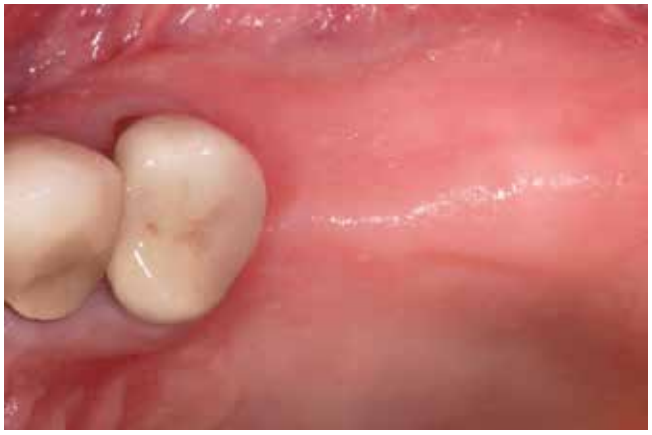
The initial situation in the patient represented a critical case for the simultaneous sinus lift (Fig. 1). When preparing the sinus lift, special care was taken not to perforate the membrane. For this reason, the drillings were only widened in the crestal area, according to the drilling protocol (Fig. 2). A mixture of 70 percent autologous bone harvested from the maxillary tuberosity (Fig. 3) and drill chips, and 30 percent xenogenous bone grafting material was used to achieve the fastest and safest possible osseointegration. The cavity was initially loosely filled with the bone mixture (Fig. 4).

Since the implants must heal covered due to the extremely low bone height, they were closed with the screw (Fig. 5 to 7). The bone mixture was then placed compactly around the implants in the cavity (Fig. 8).

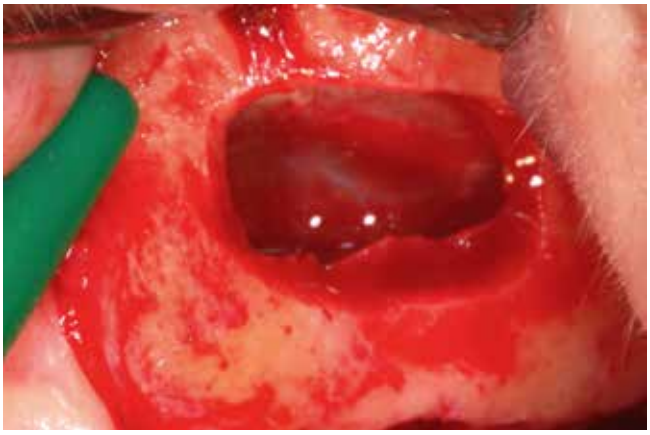
The bone graft which was stored in saline solution was placed over the vestibular window (Fig. 9). An x-ray image was made to check the augmentation with simultaneous implant placement (Fig. 10).

After taking the impression and fabricating the master models, abutment crowns were designed on titanium adhesive bases, fabricated from zirconium oxide in the CAD/CAM procedure and individually veneered (Fig. 11 to 16).

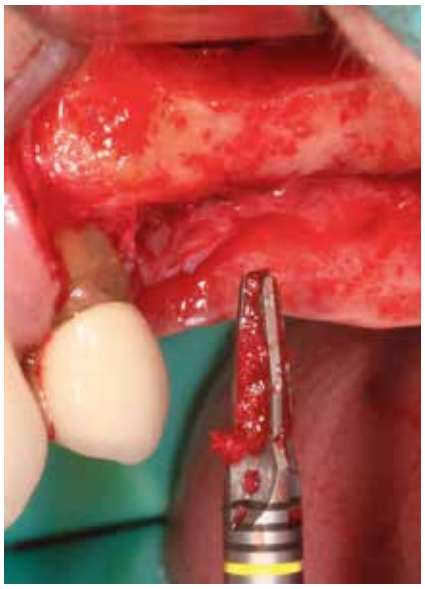
At the follow-up after 6 months the implant restoration was stable and in good hygienic condition. The gingival margin was not irritated (Fig. 17).



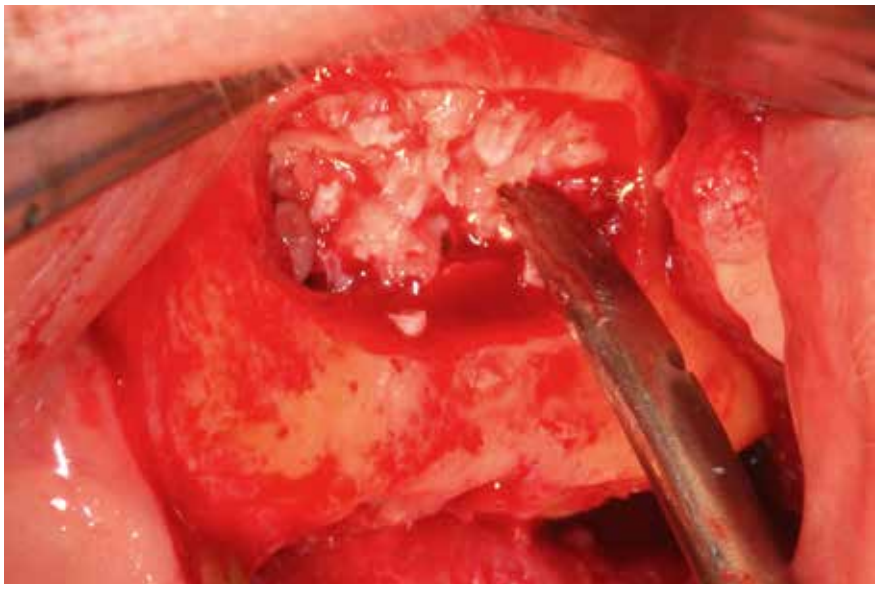
1 I Initial clinical situation



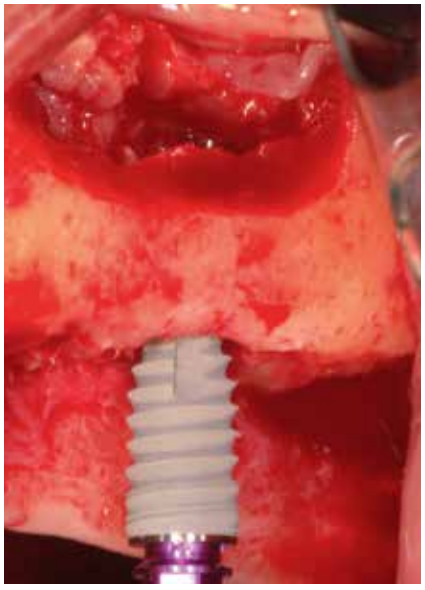
2 I Primed external sinus lift with view on the elevated Schneider's membrane.



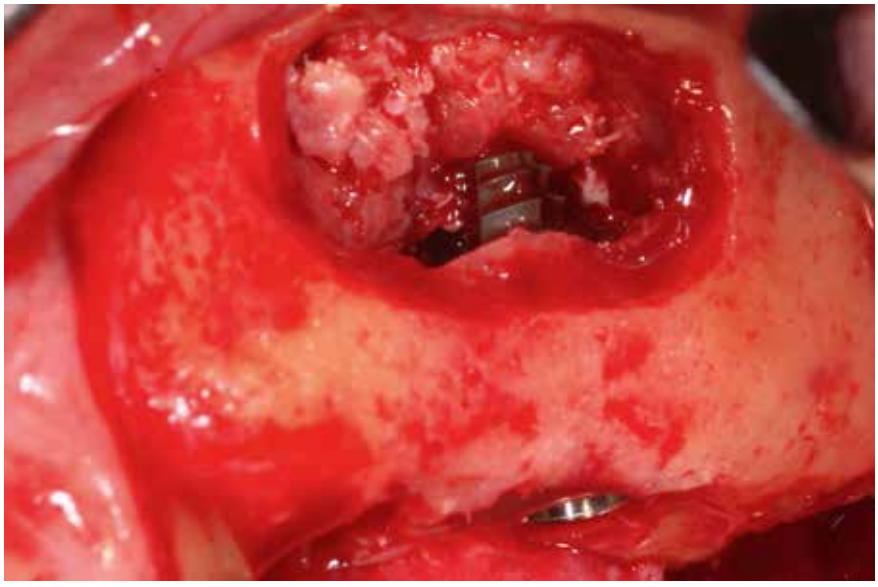
3 I Extraction of autologous bone chips



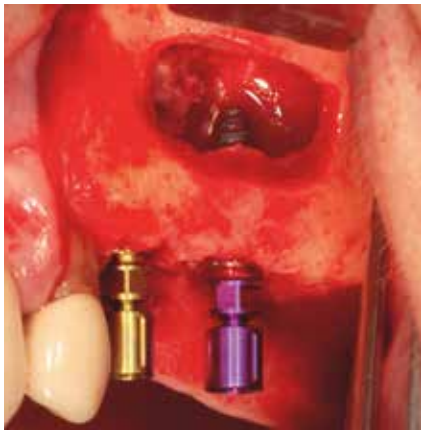
4 I Loose filling of the cavity with a mixture of autologous bone and bovine bone replacement material



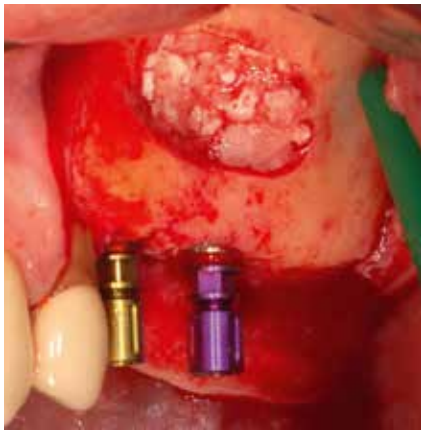
5 I Implant insertion



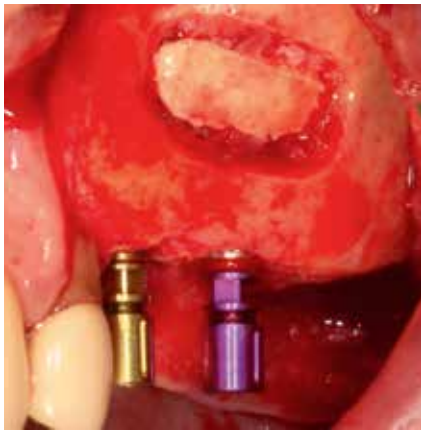
6 I Distal implant in situ



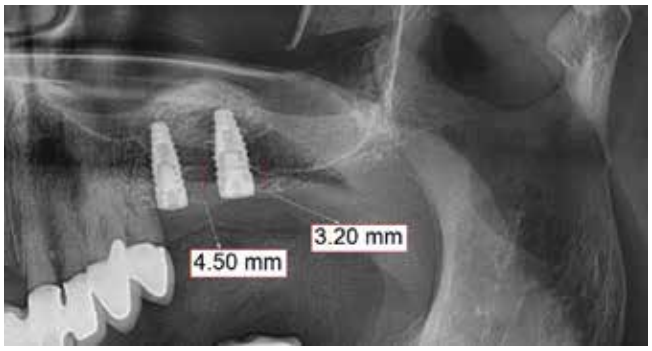
7 I Placed implants



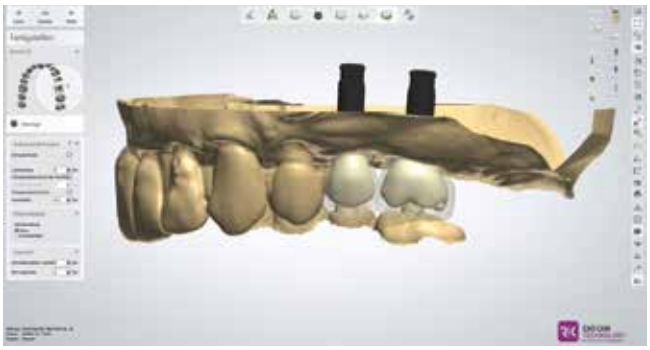
8 I Filling with autologous bone and bovine bone replacement material



9 I Replantation of the bone graft

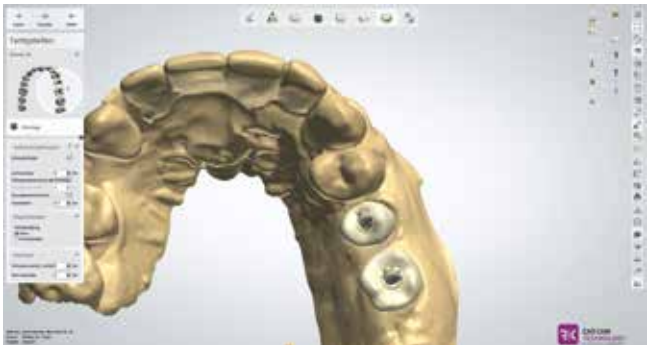


10 I Detail of the orthopantomogram immediately after surgery showing the residual bone height



11 I CAD/CAM construction as a hybrid abutment crown laterally

12 I CAD/CAM construction as a hybrid abutment crown frontally

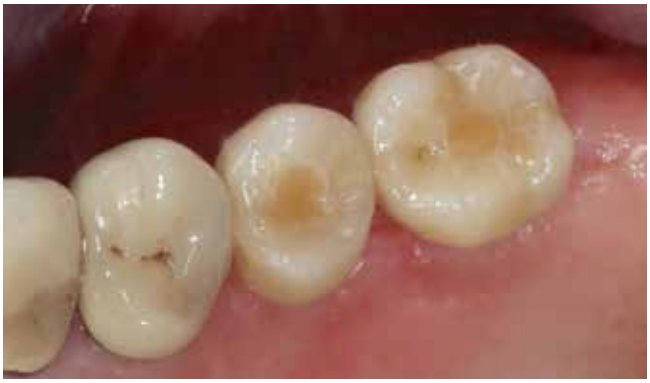


13 I CAD/CAM construction as a hybrid abutment crown occlusal

14 I Adhesive abutments on the plaster model

15 I Finalization with molten mass

16 I Hybrid abutment crowns ready for insertion



17 I Crowns in place

A questionnaire was sent to both patients and referring dentists after the treatment was completed. The responses were tabulated anonymously.

Patients' questionaire
(response rate: 55 of 72 questionnaires sent out were returned, 76.4%)

1. Where did you get information about implants/implant restorations before you went to the dentist or started therapy?

	Frequency	Valid %
From the internet	6	7.3
From friends/family	1	1.8
From the dentist	38	69.1
Got no information	3	5.5
Friends/family AND dentist	6	10.9
Internet AND dentist	2	3.6
Internet, friends/family, dentist	1	1.8
Total	55	100.0

2. Did you ask your treatment provider or family dentist for an immediate restoration (providing a dental prosthesis as soon as possible)?

		Frequency	Valid %
Valid	Yes	19	35.2
	No	35	64.8
	Total	54	100.0

2.1 If yes, how did you feel about the treatment provider's/family dentist's attitude towards a quick restoration/treatment in as few sessions as possible?

		Frequency	Valid %
Valid	Positive	18	62.1
	None discernible	8	27.6
	Negative	3	10.3
	Total	29	100.0

3. Were you proactively informed by your treatment provider/family dentist about the possibility of an immediate restoration before the treatment began?

		Frequency	Valid %
Valid	Yes	24	46.2
	No	28	53.8
	Total	52	100.0

3.1 If yes, by whom?

		Frequency	Valid %
Valid	Family dentist	18	72.0
	Treatment provider	7	28.0
	Total	25	100.0

3.2 Were the advantages and disadvantages explained to you?

		Frequency	Valid %
Valid	Yes	24	85.7
	No	4	14.3
	Total	28	100.0

3.3 Were you given a cost comparison of the various restorative options?

		Frequency	Valid %
Valid	Yes	16	57.1
	No	12	42.9
	Total	28	100.0

3.4 What was the primary reason an immediate restoration was agreed on?

		Frequency	Valid %
Valid	Cost	1	7.7
	Dentist	3	23.1
	Aesthetics	5	38.5
	Treatment time AND aesthetics	1	7.7
	Necessity	1	7.7
	Costs, dentist, treatment time, aesthetics	1	7.7
	Dentist AND treatment time	1	7.7
	Total	13	100.0

3.5 What was the primary reason to reject immediate restoration?

		Frequency	Valid %
Valid	Dentist	1	10.0
	Treatment time	1	10.0
	Aesthetics	1	10.0
	Other	3	30.0
	Dentist AND aesthetics	2	20.0
	Fear of complications	1	10.0
	Not possible	1	10.0
	Total	10	100.0

4. Are you satisfied with the overall result of your implant restoration?

		Frequency	Valid %
Valid	Highly satisfied	38	73.1
	Satisfied	12	26.9
	Total	52	100.0

5. By hindsight, would you opt for the same treatment course again?

		Frequency	Valid %
Valid	Yes	48	90.6
	Uncertain	5	9.4
	Total	53	100.0

6. Was the result of the implant therapy worth the treatment cost?

		Frequency	Valid %
Valid	Yes	42	82.6
	Uncertain	9	17.4
	Total	51	100.0

7. How satisfied are you with the cooperation between your family dentist and the implanting dentist?

		Frequency	Valid %
Valid	Highly satisfied	40	76.9
	Satisfied	11	21.2
	Not satisfied at all	1	1.9
	Total	52	100.0

8. What was your main reason for choosing implant therapy?

		Frequency	Valid %
Valid	Recommendation by dentist	4	7.7
	Aesthetics	9	17.3
	Prosthetic reasons (fixed restoration, free palate, no bridge)	18	34.6
	Positive prior experience	7	13.5
	Other (necessity, durability, ...)	14	26.9
	Total	52	100.0

A1. In case of immediate restoration: would you consider a lengthier treatment course (late treatment with additional treatment appointments) if this were cheaper?

		Frequency	Valid %
Valid	No	18	66.7
	Yes, if at least 10% cheaper	4	14.8
	Yes, if at least 20% cheaper	5	18.5
	Total	27	100.0

B1. In case of late restoration: would you accept a higher risk of complications in the treatment for a faster treatment path (immediate restoration: fewer treatment appointments, aesthetic crown right from the start)?

		Frequency	Valid %
Valid	Yes	6	10.9
	No	49	89.1
	Total	55	100.0

B2. In the case of late restoration: would you accept a higher cost for an immediate treatment, i.e. a faster treatment course?

		Frequency	Valid %
Valid	Yes	11	20.8
	No	42	79.2
	Total	53	100.0

Referring dentists' questionnaire (response rate: n = 17, approx. 53%)

1. Where do you think your patients got their information about implants/implant restorations:
From the Internet?

		Frequency	Valid %
Valid	All	1	5.9
	More than half	9	52.9
	Few	3	17.6
	No data	4	23.5
	Total	17	100.0

From friends/family?

		Frequency	Valid %
Valid	All	3	17.6
	More than half	8	47.1
	Few	4	23.5
	No data	2	11.8
	Total	17	100.0

From the practice (waiting room, dental hygienist, dentist)?

		Frequency	Valid %
Valid	All	8	47.1
	More than half	7	41.2
	Few	1	5.9
	No data	1	5.9
	Total	17	100.0

Others?

		Frequency	Valid %
Valid	More than half	1	5.9
	No data	16	94.1
	Total	17	100.0

Got no information?

		Frequency	Valid %
Valid	Few	2	11.8
	No data	15	88.2
	Total	17	100.0

2. Is the healing time in oral implantology a reason for you to decide against implants?

		Frequency	Valid %
Valid	Yes	2	11.8
	No	15	88.2
	Total	17	100.0

3. Do your patients complain about problems with e.g. provisional restorations during the healing phase?

		Frequency	Valid %
Valid	Yes	13	76.5
	No	4	23.5
	Total	17	100.0

4. Type of problems (by category)

		Frequency	Valid %
Valid	Aversion to prostheses	1	10.0
	Fractures, retention	1	10.0
	Comfort	7	70.0
	Complete dentures	1	10.0
	Total	10	100.0

5. What is your assessment of the risk of complications for immediate restorations compared to late restorations?

		Frequency	Valid %
Valid	Identical risk	2	12.5
	Slightly elevated risk, 1%)	4	25.0
	Elevated risk, 60%	1	6.3
	Elevated risk, 20%	3	18.8
	Elevated risk, 50%	1	6.3
	Elevated risk, 30%	3	18.8
	Elevated risk, 10%	1	6.3
	Elevated risk, 40%	1	6.3
	Total	16	100.0

5. How many of your patients ask about immediate restorations?

		Frequency	Valid %
Valid	All of them	1	5.9
	Two-thirds of them	2	11.8
	One-third of them	1	5.9
	Hardly any of them	13	76.5
	Total	17	100.0

6. Did you proactively inform patients about the possibility of immediate restorations and alternatives?

		Frequency	Valid %
Valid	Yes	2	11.8
	No	15	88.2
	Total	17	100.0

7. Do your patients accept healing periods of several months, or do you have a feeling that patients may decide against implants because of the healing times?

		Frequency	Valid %
Valid	Healing times accepted by patients	10	58.8
	Healing times a reason to opt against implant treatment	5	29.4
	50/50: healing time, for/against implant treatment	2	11.8
	Total	17	100.0

8. Would the possibility of offering more immediate restorations in your practice be an important advertising tool or unique selling point?

		Frequency	Valid %
Valid	Yes	8	50.0
	No	7	43.8
	"Good question"	1	6.3
	Total	16	100.0

9. How satisfied are you with the cooperation as a referring dentist so far?

		Frequency	Valid %
Valid	Highly satisfied	14	82.4
	Satisfied	3	17.6
	Total	17	100.0

Results

The implants were placed mainly in D3 and D4 bone (*Lekholm* and *Zarb* bone classes) (D3, 42.7%; D4, 27.4%). The number of implants inserted per patient varied (1–12 implants per patient), cases with one (30.6 %) and two (40.3 %) implants being the most frequent. The average insertion torque achieved was 31.6 ± 5.4 Ncm; all implants exhibited primary stability. Of the implants, 140 were placed in the maxilla and 26 in the mandible. Augmentation was performed in 93.4 % of cases, most frequently an internal (61.3 %) or external (14.2 %) sinus lift, with simultaneous implant placement in all cases. Seven implants were immediately placed and also immediately loaded (immediate restoration with fixed dental prostheses). The majority of 159 implants were placed more than 3 months after extraction (late implant placement) and not restored prosthetically until after healing. A total of 66 implants healed transgingivally, while submerged healing was selected for 100 implants. 39.8 % of implants healed transgingivally: for 60.2 %, submerged healing was chosen. A combination of immediate implant placement and immediate loading was performed in 4.2 % of cases. No complications were seen. The implant survival rate was 100 %. The mean healing time until the final prosthetic restoration was 12 ± 6 weeks. No complications occurred during the observation period of the study.

In addition to the implant evaluation, an anonymous questionnaire was submitted to both patients and referring dentists/prosthodontists. The evaluation of the patient questionnaire showed that 35.2% of patients had asked for an immediate loading or restoration of their own accord, while 46.2% were informed of the option by the treatment provider. Regardless of the chosen type of restoration, all patients were satisfied with their treatment outcomes (very satisfied, 73.1 %; satisfied; 26.9 %), and 90.6% would opt for the same treatment again. However, only few patients were prepared to ac-

cept higher costs or an elevated risk to enjoy a faster treatment course (higher costs, 33.3 %; elevated risk, 10.9 %).

Evaluation of the referrer questionnaire showed that healing time is a criterion that informs implant decisions for only 11.8 %. On the other hand, 76.5 % reported their patients had problems with their provisional restorations during the healing period (pressure sores, reduced comfort or aesthetics, restorative complications such as fractures, etc.). Of all dentists, 76.5 % said they were rarely or never approached by their patients about immediate restoration concepts; 29.4 % see healing periods of several months as a reason for patients to reject implant treatment; 87.5 % fear an increased risk of complications with immediate restorations. Around half of respondents believe that more immediate restorations in their practice could be an important advertising tool or unique selling point.

Discussion

Concepts for immediate implant placement or immediate loading have become increasingly salient in the perception of both patients and dentists. While initially, only the primary splinting of 4 interforaminal implants in the mandible for restoration with an overdenture prosthesis had been scientifically recognized, in 2002, the German Society of Implantology (DGI) published a statement by its president *Professor Friedrich W. Neukam* on immediate loading without limiting contraindications. Today it is scientifically well documented that within the indications and limits of these techniques, success rates are comparable to those of delayed loading or placement [3, 4].

There is consensus in the literature that ISQ values > 65 or an insertion torque of > 25 Ncm facilitate safe immediate loading, at least for designs with primarly splinting; for single teeth, the values should be higher [5]. Whether the highest possible insertion torque should be aimed for regardless of the circumstances has been controversial in the literature. The clinical study by [*6*] found no negative effects on implant survival or crestal bone loss within 3 years despite very high insertion torques of 76.1 ± 20.8 Ncm. By contrast, [11] demonstrated the exact opposite effect in their 3-year study: the patient population with insertion torques > 50 Ncm showed significantly greater bone loss and significantly reduced implant survival rates than the group with torques of < 50 Ncm (cumulative success rates: 91.3 % at > 50 Ncm versus 98.2 % at < 50 Ncm). On the other hand, a recent meta-analysis of the available literature suggests that insertion torques of > 50 Ncm do not have a negative impact on implant survival rates, but encourages further investigations [7]. However, it must always be remembered that very high torques also mean a risk of implant or abutment/screw fractures.

Internal and external sinus lifts have been scientifically documented for 30 years. Several literature meta-analyses have shown high survival rates for implants in combination with internal or external sinus lift procedures [*8, 9*]. Implant placement simultaneously with sinus lift procedures reduces patient morbidity as well as the number of surgical procedures and is therefore preferable. A prerequisite for this is the primary stability of the implants in the existing residual bone [10]. The present study shows that the crestal anchoring thread made it possible to place the implants investigated with primary stability in all cases, even in patients with very low residual bone heights of < 3 mm. Therefore, all patients in the study group could be implanted simultaneously with the sinus lift, regardless of whether an internal or external sinus lift was chosen. The implant survival rate was 100 % during the observation period.

The evaluation of the referring dentist and patient questionnaires showed that many patients are now aware of techniques for immediate restoration or immediate implant placement. Thus, 35.2 % of patients proactively requested immediate implantation or restoration. However, the majority of patients do not consider shortened healing times to be the determining factor for or against implant treatment. Irrespective of the selected implantation and restoration protocol, patient acceptance of the chosen method was very high (very satisfied, 73.1 %; satisfied; 26.9 %). Higher costs for immediate placement or restoration would be accepted by 20.8 % of patients; only 10.9 % would be prepared to accept an elevated risk to this end.

In the perception of the referring dentists, there is still a clear level of distrust in immediate placement or restoration. Thus, 87.5 % of respondents fear an increased risk of complications compared to conventional late implantation/late restoration. This is not consistent with the scientific literature [3, 4]. Obviously, there is still a need for more information, information not available in postgraduate training and continuing education. Only 11.8 % of the referrers consider the duration of the healing time or the time until prosthetic restoration to be a factor against implants. However, problems with provisional restorations during the healing period are common (76.5 %). High-quality provisional restorations therefore seem to be more important than the duration of the healing period.

Conclusions

The thread design of the Progressive-Line implants used in this study makes them suitable for immediate implant placement and immediate loading techniques. Shorter healing times and less invasive surgical protocols with fewer procedures, e.g. simultaneous implantation with external sinus lifts, are possible without compromising implant survival rates. Immediate restoration concepts are playing an increasingly significant role in the patients' perception, but only few patients are prepared to accept higher costs or risks to this end. Regardless of the procedure chosen, patient acceptance of implant treatments is very high. The risks of immediate implant placement and immediate restoration are viewed much more critically by the majority of practitioners than the scientific literature justifies; there seems to be a need for more comprehensive information.

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

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One-year follow up of full arch treatment with new fully tapered tissue level implant system

Heritage meets innovation for function and aesthetics

DR EIRIK SALVESEN, NORWAY

Full-arch implant-supported fixed restoration is a very reliable option for completely edentulous patients. The Brånemark protocol proposes that four to six implants should be inserted in the interforaminal area to support a fixed, screw-retained restoration using an immediate or delayed loading protocol [1, 2]. Poor bone quality and quantity, especially of edentulous individuals, means that complete-arch restorations require dental implants to be generally placed in the anterior region, and this often results in long cantilevered prostheses. The use of long posterior cantilevers can be directly related to possible overloading of the peri-implant sites [3-5].

Introduction

To overcome soft bone density challenge and consequently low primary stability, different implant designs have been introduced in the market [6] allowing clinicians to provide implant therapy with more predictable results [7, 8].

In a parallel and complementary path, computer-aided design and manufacturing (CAD-CAM) material and chairside systems and digital workflows are increasingly being used allowing for efficient and precise treatment protocols improving patients satisfaction [9, 10].

The following case report describes a successful full arch treatment with the new Straumann TLX system restored using digital workflow. This implant hybrid design combines active engaging threads leading to more predictable primary stability as well as the proven benefits of the machined neck on soft tissues, especially in patients with periodontal disease history as demonstrated in this case report [11].

Initial situation

Fifty-one-year-old female patient, with no smoking habits, general good health conditions (ASA Cl. I) and previous history of periodontal disease which was the main factor driving the loss of the remaining teeth in the lower jaw. The patient presented to the office with the main complaint of not being able to properly enjoy meals due to pain while chewing after being restored with conventional denture subsequent to the loss of all teeth in the lower arch. Based on the positive experience with dental implants in the upper arch the patient aimed for similar solution for the lower arch.

Treatment planning

After clinical examination and assessment of panoramic radiograph (Fig. 1), it was possible to estimate favorable dimensions for full arch treatment with dental implants. To confirm available bone dimensions and quality, a CBCT (Cone Beam Computer Tomography) was further conducted (Fig. 2). The soft tissue quality could also be favorably observed, encouraging to go on with the implant supported fixed restoration therapy (Fig. 3).

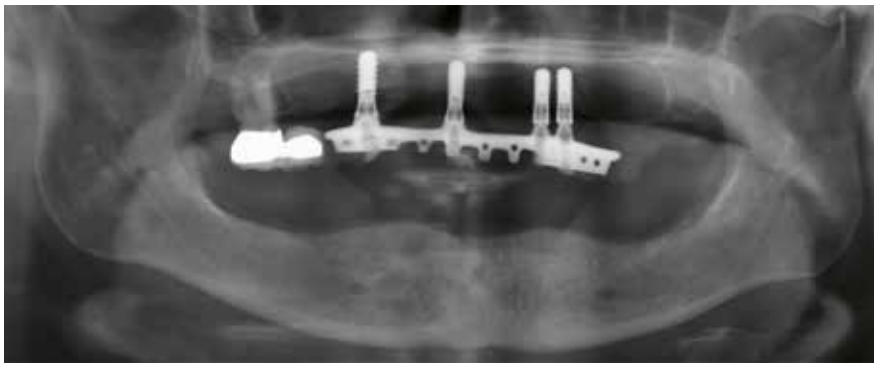
The patient's dental history showed the extractions occurred around 6 months prior to the assessment consultation, the CBCT was decisive to estimate a generally medium to soft bone type which would require implants with active endosteal design to ensure the desired primary stability. The patient's periodontal history also requires this patient to receive implants which could provide stable soft tissue conditions as well as easy maintenance.

Surgical planning aimed the placement of four Straumann TLX implants Ø 3.75 mm, RT, length 12 mm, Roxolid, SLActive positioned in the anterior region where more bone availability was present and two Straumann TLX implants Ø 3.75 mm, RT, length 8 mm, Roxolid, SLActive bi-lateraly in the posterior region where bone height was compromised.

The patient explicitly manifested the wish for a restoration with more natural looking teeth as possible, so it was planned to have a customized prosthetic framework produced by centralized milling center (Createch–Mendaro/Spain) and individual ceramic crowns produced by our laboratory (Proteket – Oslo/Norway) to be cemented to the framework providing great esthetics.

Surgical procedures

Under local anesthesia and intra vascular sedation to ensure patient comfort



1 I Initial situation

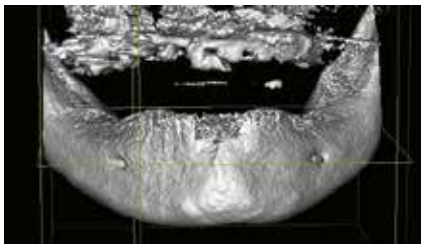
as well as to monitor the patient's vital signs, one continuous supra crestal incision from second molar to second molar region was done with the use of blade 15c and a full muco-periosteal flap was elevated in order to expose the entire ridge as well as to expose the mental foramen.

To ensure no sharp bony edges that could potentially disturb the soft tissue healing would remain, the ridge was smoothened and rounded (Fig. 4).

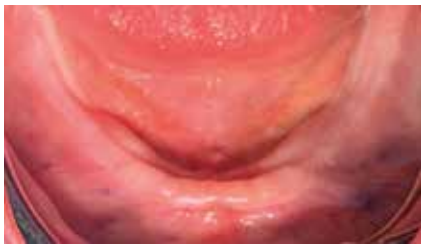
In free-hand technique, the osteotomy started with the anterior sites ensuring adequate distribution along the intra foraminal space with the use of the Needle drill to the length of 12 mm followed by the Ø 2.2 mm drill. The Ø 2.2 mm alignment pins were used to assess the optimal tri-dimensional positioning and depth (Fig. 5). With the alignment pins in position as reference, the osteotomy in the posterior sites was subsequently performed and at this moment all sites were assessed tri-dimensionally. The same steps were repeated with the Ø 2.8 mm drill and respective alignment pins (Fig. 6).

With all sites ready (Fig. 7), the placement of all implants was initiated with the motor hand piece at 25 rpm and finalized into its optimal position with the Straumann surgical ratchet and Torque Control with torque values measuring above 35 Ncm (Fig. 8).

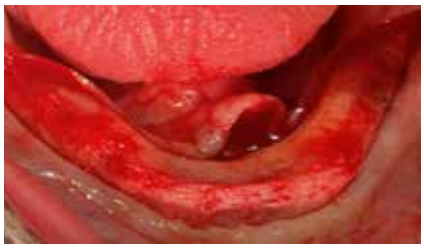
RT healing abutments with 3.0 mm height were screwed onto the implant and sutures applied in order to bring the flaps together allowing soft tissue stability along the healing time in one- stage approach (Fig. 9). An immediate post-operative panoramic radiograph was also taken to ensure all implants were in optimal conditions prior to allowing the patient to return home (Fig. 10).



2 I CBCT three-dimensional image



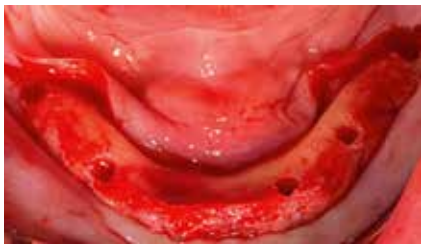
3 I Soft tissue assessment



4 I Bone ridge exposed

5 I Initial osteotomy checked with alignment pins

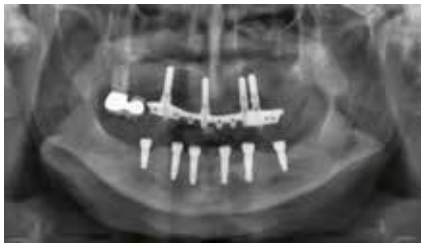
6 I All sites prepared and checked with alignment pins



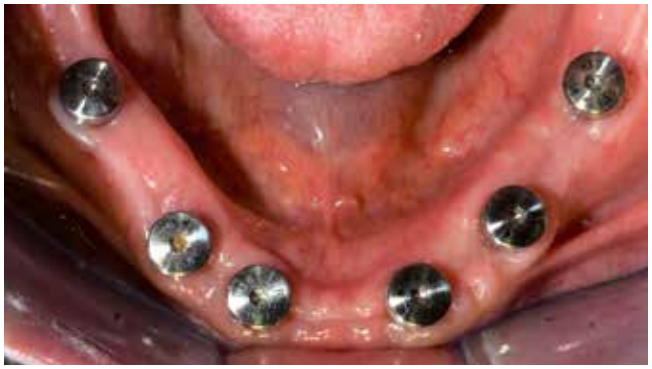
7 I Osteotomy aspect after complete preparation

8 I Implants in final position

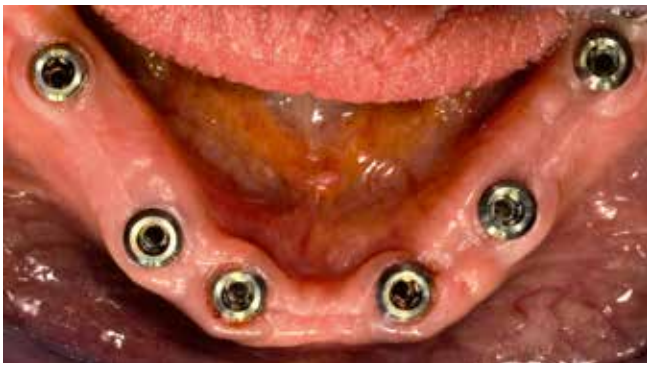
9 I Healing abutments in place



10 I Immediate post- operative panoramic radiograph



11 I Occlusal view after 2 months follow- up



12 I Healing abutments removed

With the fresh memory of how much discomfort the patient felt while using the previous prosthesis, she chose to undergo the following healing days for conventional loading without the use of any prosthetic device.

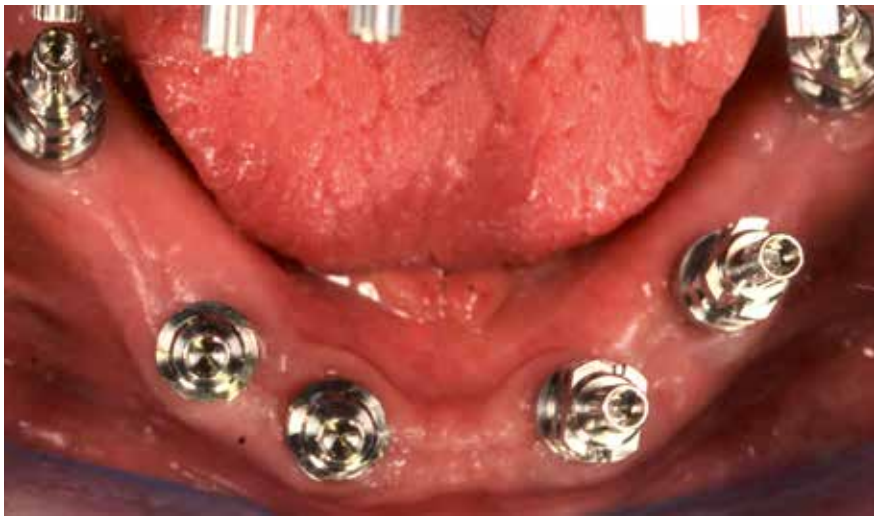
Restorative procedures

After two months, the patient returned to the office so implants osseointegration and overall healing could be assessed. With the implants absent from mobility and with outstanding soft tissue healing, we initiated the restorative phase (Fig. 11).

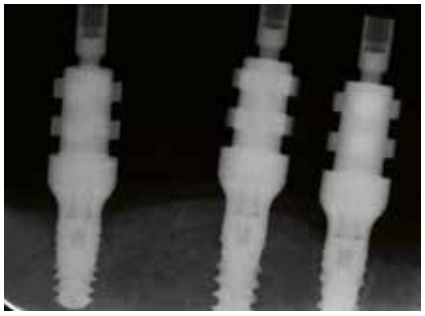
All healing abutments were removed (Fig. 12) and open tray impression posts were placed onto the implants (Fig. 13). Periapical radiographs were taken to ensure adequate seating (Fig. 14 and 15). Dental floss was tied around the impression posts serving as a net retaining the resin applied to splint all components together in order to minimize the chances they would move during the impression procedure, potentially compromising the fidelity of the positions being transferred to the model, which could compromise the passive seating of the future framework (Fig. 16). Wax rims were also produced and properly adjusted in the mouth in order to transfer as much information as possible to the dental laboratory such as vertical dimension, buccal corridor, Spee curve and mid-line (Figs. 17 and 18).

The impression and the antagonist model were sent to our laboratory (Proteket, Oslo/Norway) for processing. After stone cast model production, the necessary material was sent to centralized milling company (Createch) for further processing, model scanning and framework milling (Fig. 19).

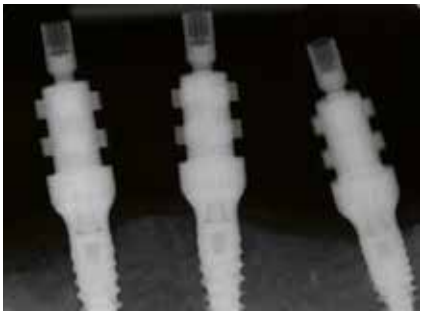
The framework followed the "Abutment Hybrid" concept, and it was designed and milled in such a way leaving the occluding part with the resemblance of natural teeth undergone crown preparation so individual single crowns could be prepared and cemented to the framework (Figs. 20 and 21). The framework was sent back to our laboratory where it received an opaque layer (Figs. 22 and 23) and then artificial acrylic gingiva was applied and cured onto it after thoroughly discussing with the patient how she wanted it to look. The framework was



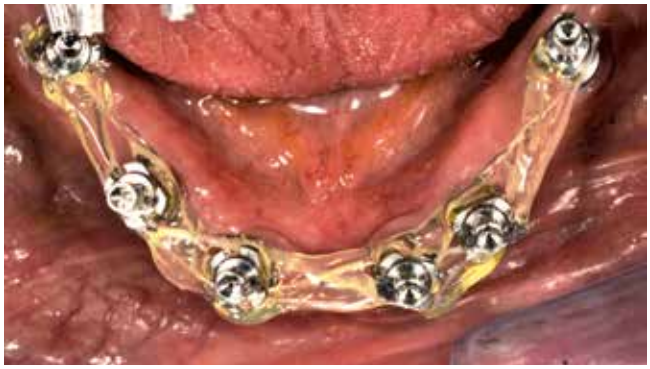
13 I Impression posts in position



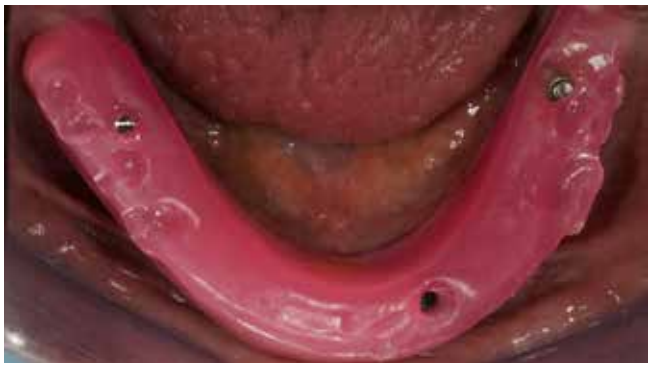
14 I Periapical radiograph confirming correct component seating left



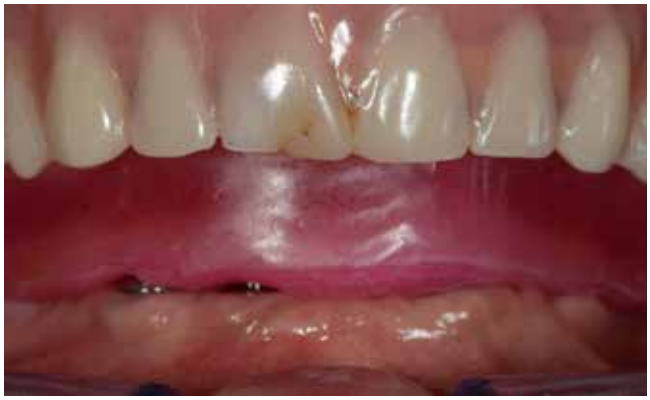
15 I Periapical radiograph confirming correct component seating right



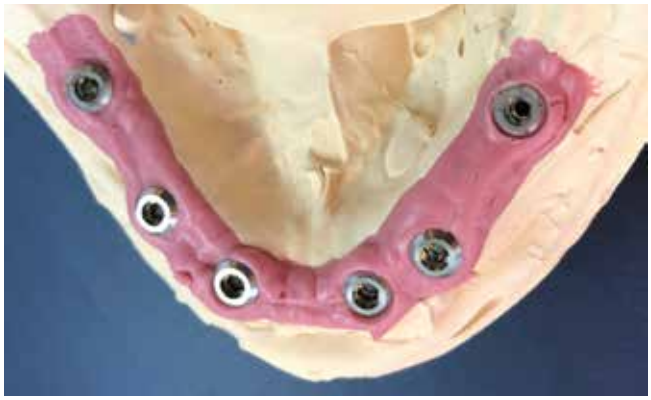
16 I Impression posts splinted by light curing composite



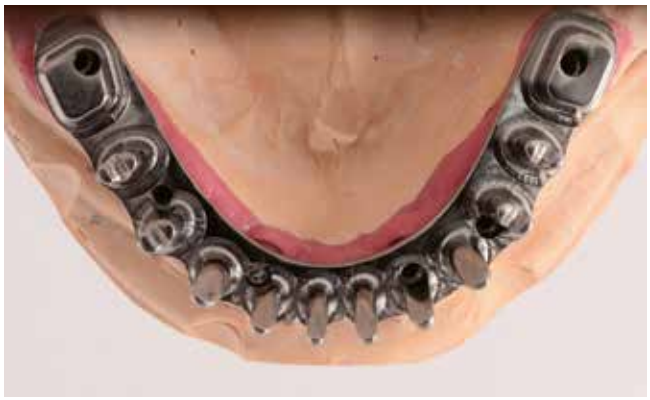
17 I Wax rim – occlusal view



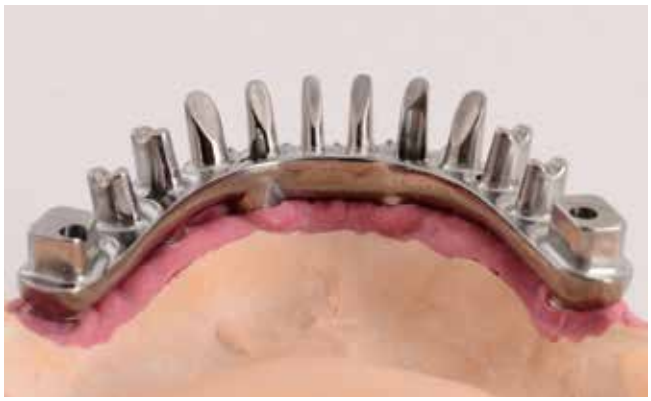
18 I Wax rim in occlusion – frontal view



19 I Cast model ready for scanning

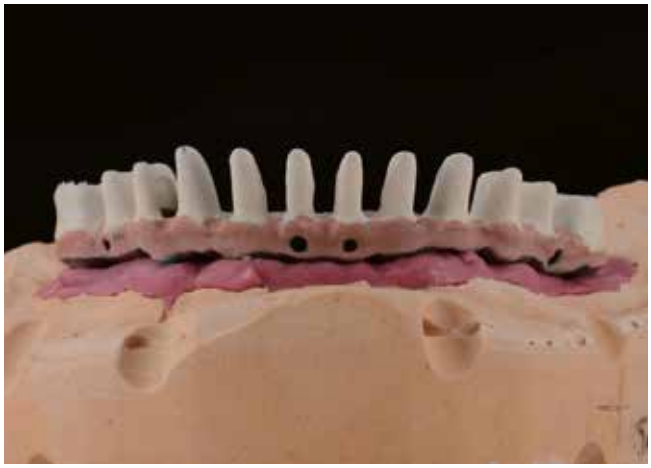


20 I Centralized milled framework – occlusal view

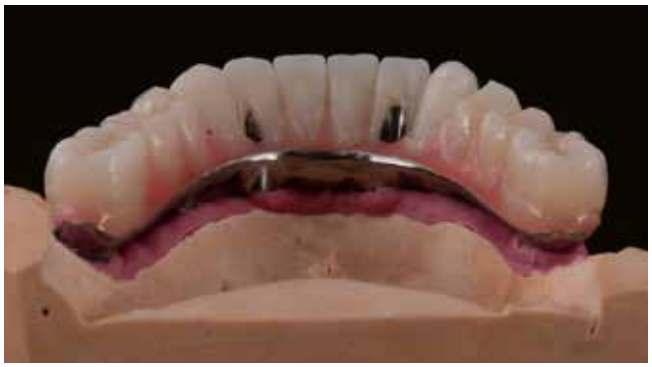


21 I Centralized milled framework – lingual view

22 I Framework after opaque application – occlusal view

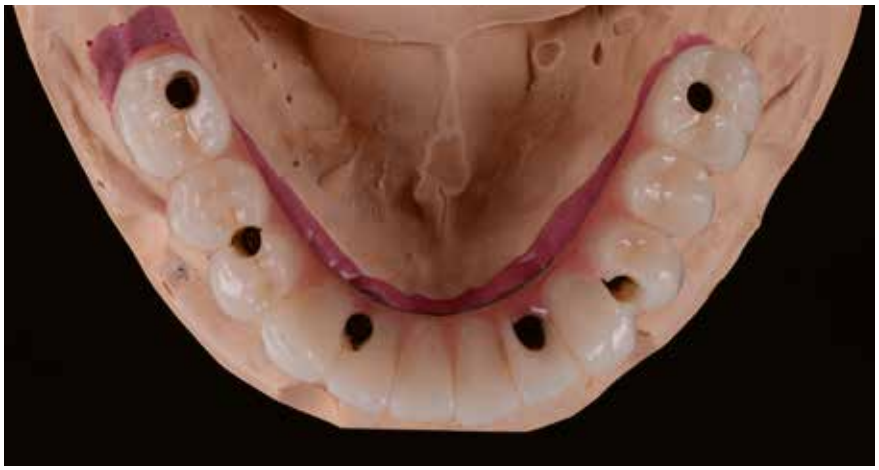


23 I Framework after opaque application – frontal view



26 I Ceramic crowns cemented to framework – lingual view

25 I Ceramic crowns cemented to framework – frontal view



24 I Ceramic crowns cemented to framework – occlusal view

then scanned so the individual crowns could be designed and produced. The next step was to cement the (Monolithic Zirconia) crowns to the framework (Fig. 24, 25 and 26).

This type of restoration benefit is highlighted in the patient's emotional and tactile feeling when flossing and natural esthetics. From the technical point of view, it has the advantage of individual tooth replacement in case of potential chipping instead of the burden for the patient and doctor having to produce an entire new framework.

The restoration was seated on to the abutments and the screws were tightened with a torque of 35 Ncm. The screw heads were properly protected with Teflon tape and light cured composite was used to finalize and protect the access. Due to the history of periodontitis it was mandatory that the restoration would provide full cleanability access (Fig. 27, 28 and 29). A final panoramic radiograph was taken to ensure proper prosthetic seating at the day of the delivery and one year after in the follow- up consultation (Fig. 30 and 31).

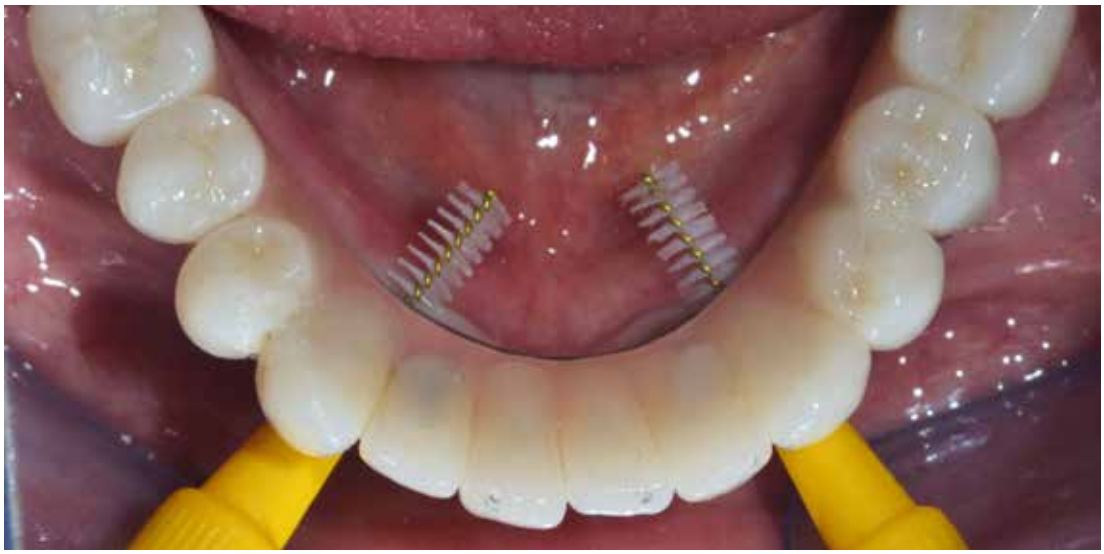
Treatment outcomes

The patient is completely satisfied with the treatment from all perspectives. She is now able to chew her favorite foods with confidence, without pain or discomfort, and is equally confident at social occasions where she does not have to fear that her dentures will fall out of her mouth at any time. In addition, the patient was so satisfied with the new solution for the lower jaw, that she decided to have a rework of her former implant-supported bridge on the upper jaw.

Discussion

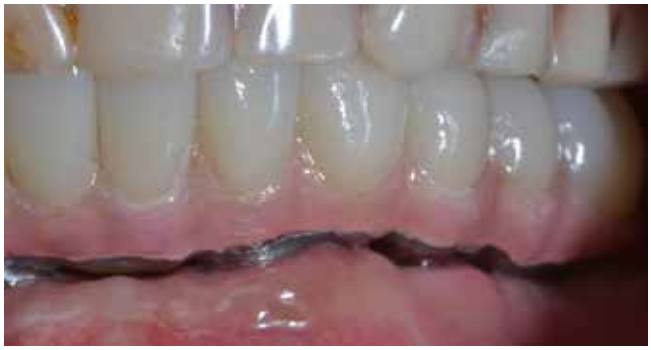
Aiming for clinical success selecting an implant that provides adequate primary stability in the bone bed is essential. Primary stability depends on the bone quality, surgical technique, and implant design [12]. According to *Wilson et al.* [13], the proper design of the tapered implant with a screw-tapered shape provides greater stability because it applies pressure on the cortical bone at the time of installation, thus promoting a balance between compressive and tensile forces while minimizing shear force generation. It is expected that tapered implant design favours the biomechanical strength of the bone-implant interface. Currently, however, there is no consensus about marginal bone loss as a consequence of the use of tapered versus parallel walled implants, while *Lee and colleagues* achieved a better clinical performance with tapered implants in the posterior mandible [14].

The principle of crestal bone remodelling (saucerisation) around a dental implant has been widely noted in the literature [15]. The etiology of this bone loss can vary depending on the type of implant (one-piece vs. two-piece) and also on the type of abutment especially in case of two-piece implants [16]. Bone Level implant is a type of two- piece im-

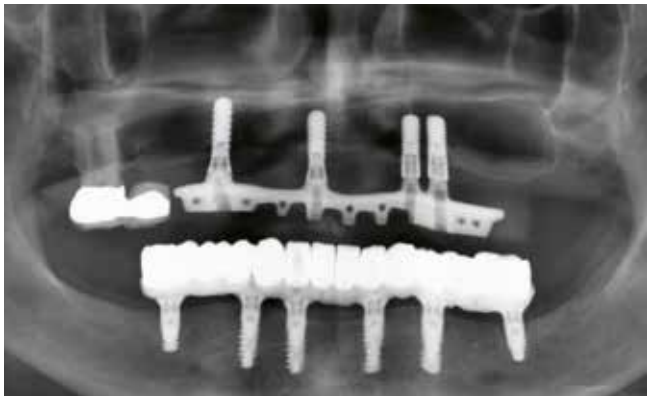


27 I Restoration allowing proper cleaning

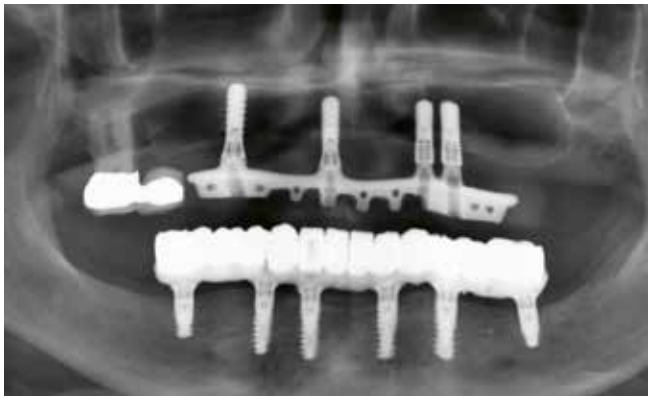
28 I Restoration final seating – right side



29 I Restoration final seating – left side



30 I Final panoramic radiograph



31 I 1 year follow up panoramic radiograph

plant with the IAJ at the level of crestal bone and uses a horizontal offset concept whereas, Tissue Level implant which was used in this case report is a type of two-piece implant, where the IAJ is above the crestal bone, at the soft tissue level.

Studies demonstrated that moving the IAJ supra-crestally reduces peri-implant bone loss as a greater amount of inflammatory cells was seen in cases of sub-crestal implant placement [11].

Finally, dentists and patients can benefit from implants whose design makes the primary stability of the implant predictable, especially when immediate treatment protocols are sought. In a different perspective but also on the benefit context, tapered endosteal design in combination with Tissue Level neck design, as presented in this case report seems a promising solution.

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Expanding the indication span of recent immediate intermediate abutments

Transforming “bone level” implants into “tissue level” implants

DAVARPANAH MITHRIDADE[1], RAJZBAUM PHILIPPE[2], DAVARPANAH KEYVAN[3], SATER SARAH[4]

Manufacturers of two-piece implants are now offering a dedicated immediate intermediate abutment which is seated directly into the implant neck during surgery and which is no further removed. This item transforms a ‘bone level’ implant into a ‘tissue level’ one. Aim of the present paper is to present a clinical example of the use of this intermediate abutment, beyond its intended intraoperative indication.

Introduction

Since the early days of modern implantology, two distinct designs of dental implants have coexisted to suit the 1-stage and the 2-stage surgical approaches.

Implants dedicated to 1-stage surgery comprised two different portions within a single piece: a roughened screw portion in contact with bone, and a smooth neck in contact with the gingiva. Immediately after surgery the soft tissues start healing around the implant neck. The gingival seal that is further obtained is no longer disturbed during the subsequent prosthetic stage because it takes place at the level of the sulcus. This implant form is known as ‘tissue level’ implant.

Advantage of this implant design from the biological point of view in relation to the crestal bone is that there is no implant-abutment junction or micro-gap between these two components. Inconvenient is that the height of the implant collar is given; it cannot be accustomed to the local soft tissue conditions. At most two collar heights have been offered to adapt to the gingival thickness. Because this implant design does not allow closed adaptation to the local gingival tissue thickness, the aesthetic results do not always meet expectations. It is still possible to circumvent this difficulty by placing the implant in a subcrestal position; however, subcrestal position of the limit between the machined part of the collar and the roughened area of the implant results in permanent physiological bone loss [10, 2].

Implants dedicated to 2-stage surgery comprise two distinct pieces: a threaded screw portion and a transgingival abutment which is subsequently secured into the threaded portion. The junction between implant and abutment is in close proximity to the crestal bone; it is therefore known as ‘bone level’ implant. When a 1-stage surgery protocol is implemented with this 2-stage surgery implant, the prosthodontist removes the healing abutment and can choose the adequate prosthetic abutment height corresponding to the local soft tissue thickness. This allows precise adaptation of the abutment height to the local condition of the gingiva, it helps better predicting the expected aesthetic result. From a biological point of view however, this implant design presents two disadvantages. First, it introduces a gap between the implant neck and the prosthetic abutment, even more precisely at the bone level; second, the gingival seal is damaged multiple times during the prosthetic steps. These local irritations provoke apical migration of the junctional attachment entity and a subsequent crater-shaped bone resorption [1, 15]

To avoid migration of the gingival seal, it has been suggested to affix immediately a final prosthetic abutment which would not be removed; this has been named “one abutment-one time” protocol [8]. Clinical studies have demonstrated efficacy of this method in comparison to screwing-unscrewing multiple times the healing abutment during the conventional impression stages and before attaching the final prosthesis definitevely [8, 3, 13].

Up until very recently, the abutment that best suited this ‘one-abutment-one time’ approach was the multi-unit abut-

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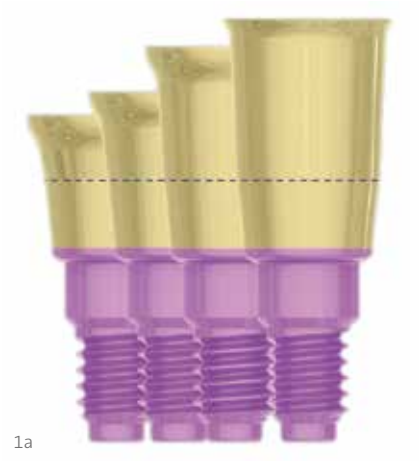
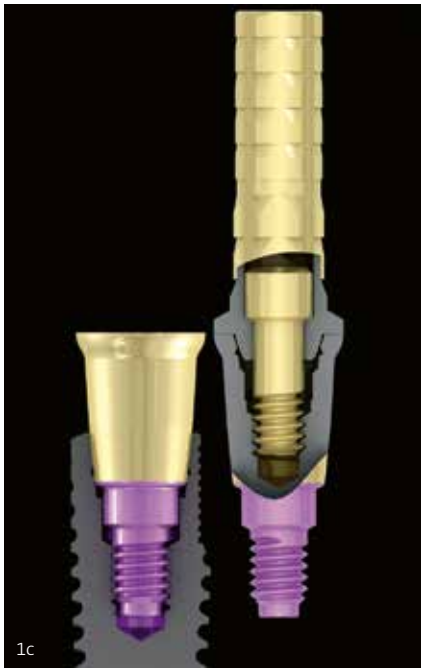
[3] Former resident, former assistant, Paris Hospitals, fellow, Oral Rehabilitation Centre (ORC), American Hospital of Paris, Neuilly-sur-Seine, Private practice, Paris
[4] Fellow, Oral Rehabilitation Centre (ORC), American Hospital of Paris, Neuilly-sur-Seine, Private practice, Paris


1a


1b


1c

Figures 1a to c I Connect (MIS) immediate intermediate abutment

1a I Connect abutments of various length, 1.5–4 mm aimed at meeting the local requirements of crestal or subcrestal placement and soft tissue thickness
1b I Intermediate abutments for narrow platform (NP) and standard platform (SP) implants. The standard platform is colour-coded.
1c I Cross-section of the Connect showing the abutment mounted on the Connect platform

ment (MUA), an item that has been developed to accommodate the plural prosthetic restoration. Moving the prosthetic working plane away from the bone level to the soft tissue level means that the mucosal seal initially formed during gingival healing is no more disturbed by any operation involved in securing the final prosthesis. However, MUA abutments are bulky and are not suited to the narrow spaces commonly restored with a single crown [7].

To better implement this recent concept, manufacturers of two-piece implants have lately brought to market a dedicated immediate tissue level abutment (ITLA). The latter is screwed directly into the implant neck during surgery and is no more unscrewed. This abutment is available in several lengths, from 1.5 to 4 mm (Figs. 1a to c); the aim is to closely adjust to the local soft tissue thickness and to the crestal/subcrestal position of the implant. After seating the ITLA to the implant collar, a cover screw is placed and sutures are secured around the abutment. Bone and gingival healing then take place simultaneously and the gingival seal is no more disturbed during the prosthetic steps. Manufacturers' indication of the ITLA is to seat it intraoperatively during implant surgery into the implant neck as shown in figures 2a to k, with the intention of no more violating the gingival seal that will be obtained.

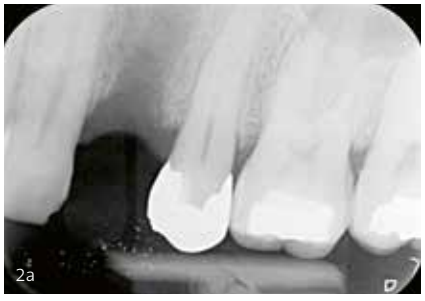
Goal of the clinical cases shown here is first to show the classical use of this item and then how it suits an indication other than the initially dedicated one. In this alternative clinical situation, instead of being placed intraoperatively, the ITLA is affixed to the implant collar at the end of the osseointegration period within a transgingival 1-stage healing protocol. Advantages and disadvantages of this new protocol are presented and discussed.

Clinical cases

Case 1.
Intraoperative placement of the ITLA

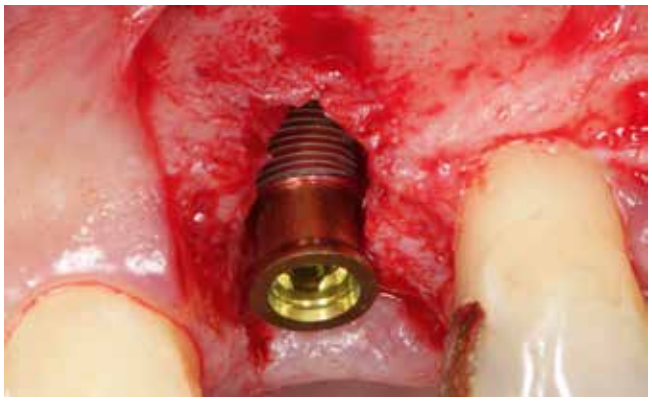
A patient attended to restore the edentulous site of her left maxillary first bicuspid (Fig. 2a). A Ø 3.9 X 13 mm implant (V3, MIS) and a 3 mm long immediate intermediate abutment (Connect, MIS) have been selected for treatment (Fig. 2b). The abutment was fastened intraoperatively into the implant neck with a 30 Ncm

Figures 2a to k I Restoration of a maxillary bicuspid using an immediate tissue level abutment fixed intraoperatively

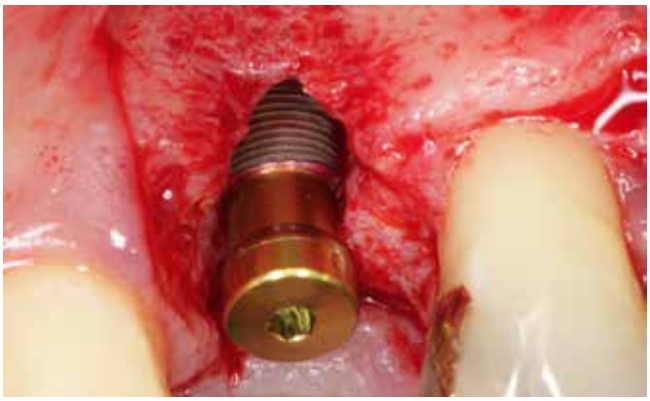

2a


2b

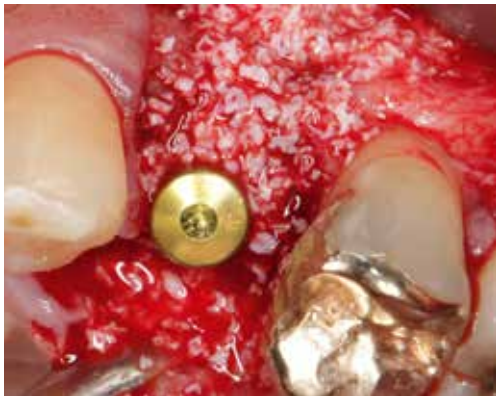
2a I Preoperative radiograph of the edentulous left first bicuspid site 2b I Selection of a 3 mm long Connect SP abutment

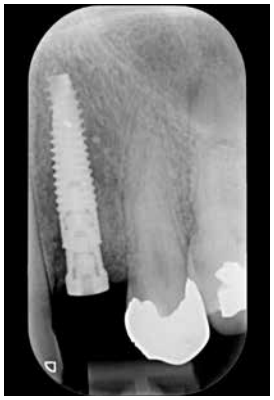


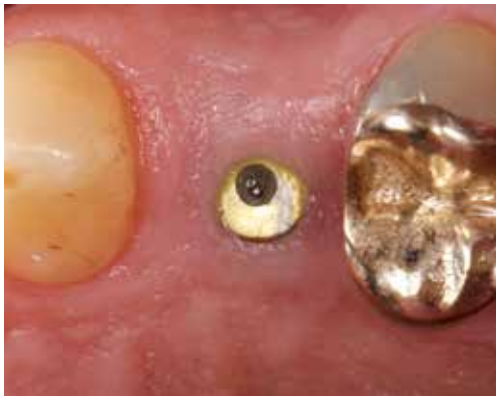
2c I Intraoperative placement of the ITLA with a 30 Ncm torque into the implant neck



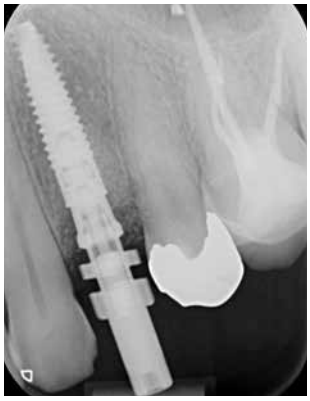
2d I Placement of the cover screw on top of the ITLA.

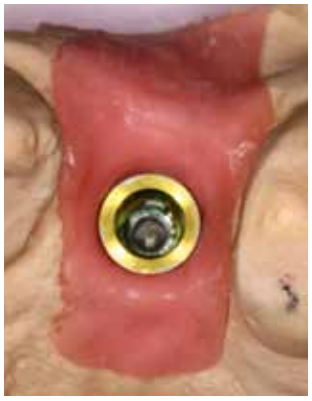


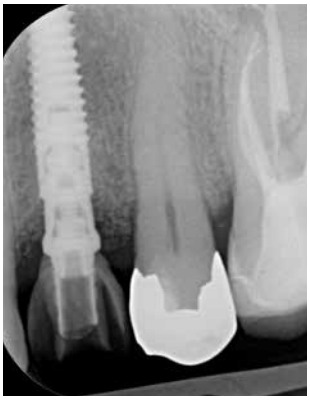


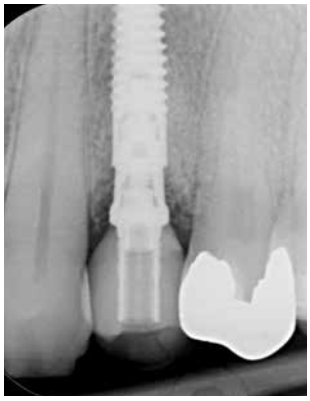


2e I Lateral augmentation intended to fill the peri-implant bone defect 2f I Postoperative radiographic control showing the implant, the immediate tissue level abutment and its cover screw 2g I Occlusal view of the soft tissues at the end of the osseointegration period









2h I Radiograph control showing the ITLA and the good seating of the impression coping 2i I Master cast with the Connect analog in place 2j I Radiographic control after placement of the temporary prosthesis. One can see the implant, the immediate tissue level abutment and the metallic temporary abutment with its crown made of resin. 2k I Radiographic control of the final prosthesis showing the implant, the ITLA and the E.Max crown mounted on a titanium abutment

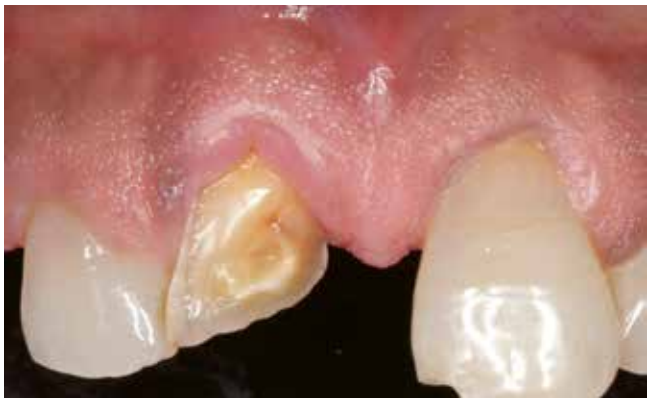
torque (Fig. 2c); then its cover screw was placed (Fig. 2d). Lateral augmentation using Bio-Oss (Geistlich) was performed in order to fill the bone defect (Fig. 2e); the flap was sutured around the ITLA. The post-operative radiographic control shows the V3 implant, the 3 mm long tissue level abutment and its cover screw (Fig. 2f). At the end of the healing period (Fig. 2g), the cover screw was removed and a specifically dedicated impression coping was screwed onto the abutment to carry out an open tray impression (Fig. 2h). The master cast included a Connect analog (Fig. 2i) and the laboratory prepared a temporary crown mounted on a titanium abutment (Fig. 2j). After an 8-week period of soft tissue maturation, the final crown was prepared and screw-retained on top of the implant neck (Fig. 2k). Because the ITLA was screwed in intraoperatively, the prosthetic working plane was moved from bone level to tissue level. All the prosthetic manipulations leading to final seating were performed without disturbing the mucosal seal at any time.

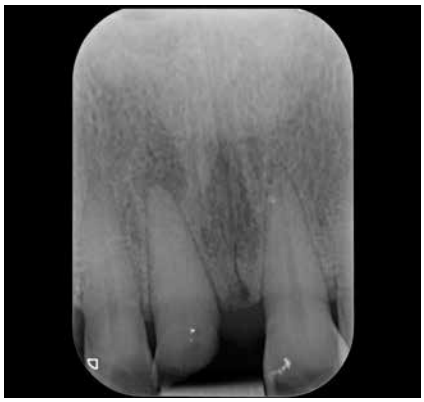
Case 2. Placement of the ITLA at the end of the osseointegration period

A patient attended after having experienced pain for a certain time at the area of the right central incisor. A subgingival fracture of the tooth was identified (Figs. 3a and b) and extraction of the tooth was diagnosed. Immediately after extraction, implant restoration was undertaken with a Ø 3.9 X 16 mm implant (V3, MIS) (Fig. 3c). A 5 mm long healing abutment was screwed into the implant neck (Fig. 3d); a lateral augmentation procedure (Bio-Oss, Geistlich) protected by a resorbable collagen membrane (Bio-Gide, Geistlich) was implemented (Figs. 3e and f). The flap was sutured around the healing abutment. By the end of the osseointegration period, the healed soft tissues have shaped and organized a gingival seal around the healing abutment (Fig. 3g). The 5 mm long abutment was unscrewed (Fig. 3h), and a 2 mm long ITLA was affixed with a 30 Ncm torque (Figs. 3i and j). The radiographic control showed the proper seating of the tissue level abutment (Fig. 3k). From this moment and forward, the prosthetic working plane was situated at the soft tissue level; the gingival seal from then on would no more be disturbed at any additional occasion but at removal of the healing abutment.

An open tray impression was taken with an impression coping specific to the abutment (Fig. 3l). The impression taken on the head of the abutment with the impression coping abutment (Fig. 3m) was sent to the dental technician lab; the latter prepared a temporary crown to be screwed on top of the Connect platform (Figs. 3n and o).

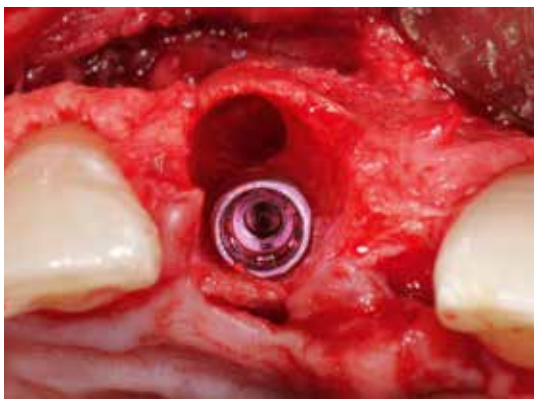
Figures 3a to o I Restoration of a right central incisor with an ITLA affixed at the end of the healing period instead of during surgery

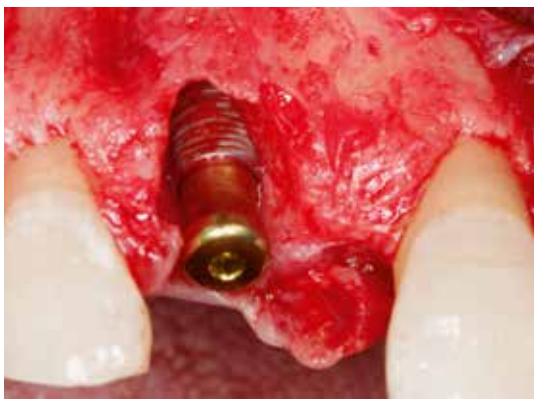




3a I Patient attended with pain in the area of the right central incisor.

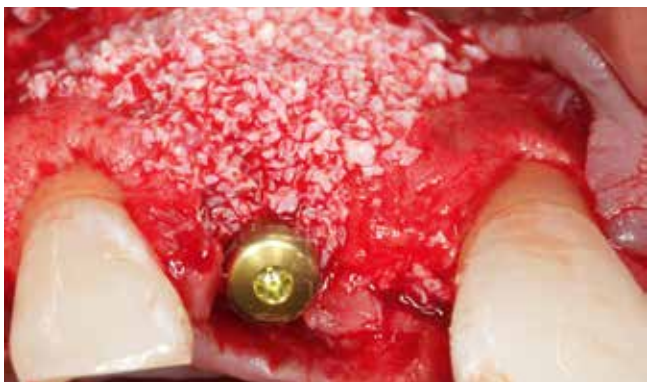
3b I Periapical X-ray of the incisor, showing the presence of a periapical cyst

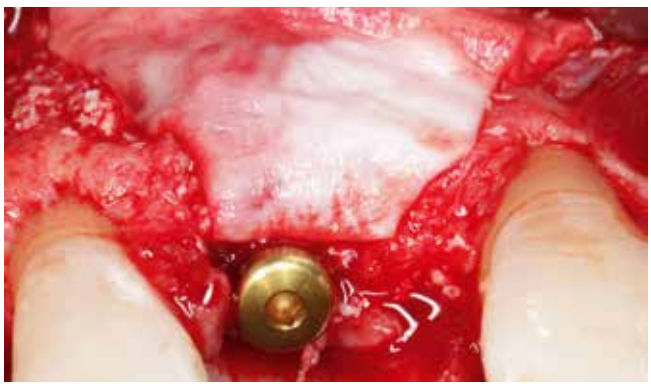




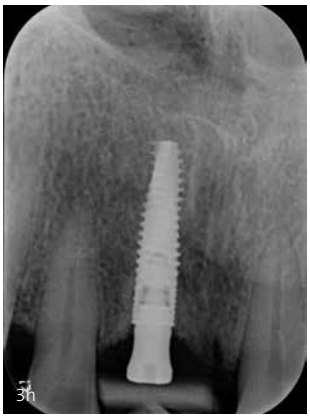
3c I Placement of a Ø 3.9 × 16 mm V3 implant immediately after extraction and cyst removal

3d I Placement of a 5 mm long healing abutment



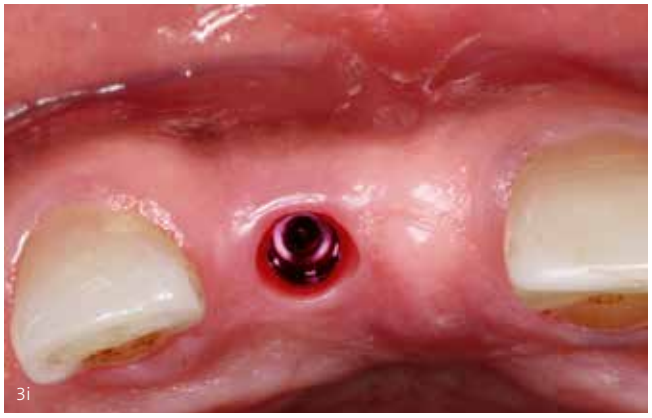


3e and f I Filling the bone defect with Bio-Oss and covering with a resorbable collagen membrane



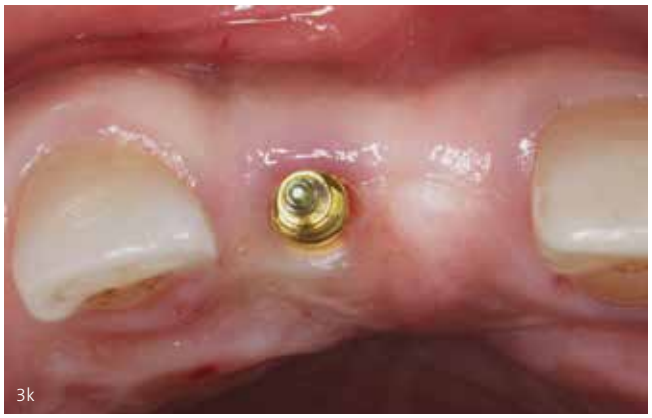
3g I View of the soft tissues with the healing abutment at the end of the osseointegration period, just before starting the prosthetic stage

3h I Postoperative radiographic control showing the implant and the 5 mm long healing abutment

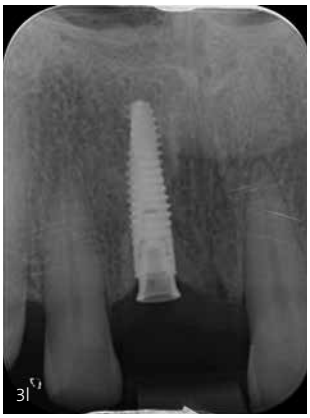


3i I Removal of the healing abutment and one-time rupture of the mucosal attachment. The violet colour-coded implant neck is visible deep in the gingival tissue.

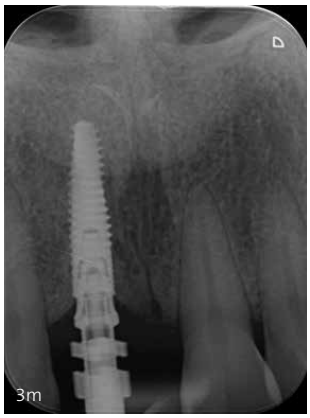
3j I Selection of a 2 mm long Connect abutment



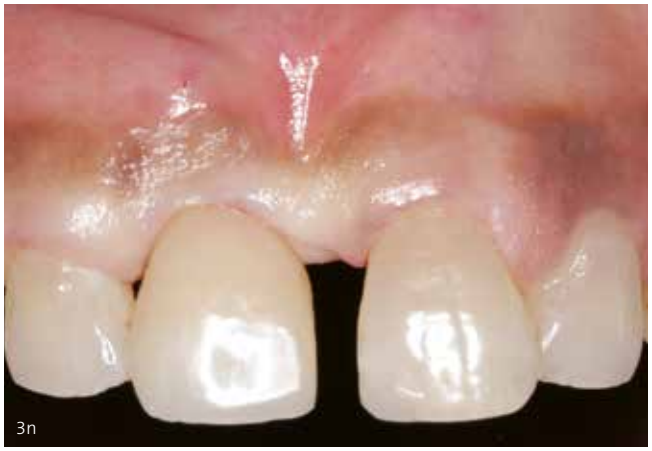
3k I View of the ITLA torqued into the implant neck before placing its protection screw

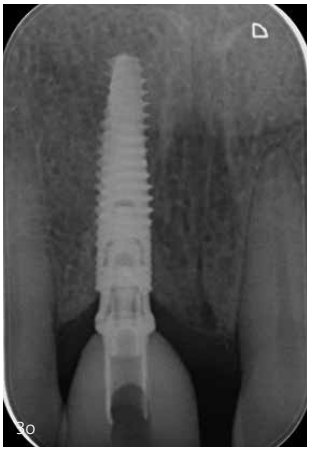


3l I Radiographic control of proper seating of the ITLA



3m I Radiographic control of proper seating of the Connect impression coping





3n I Frontal view of the temporary crown in place

3o I Radiographic control at temporary crown delivery. Note the implant, the ITLA, the prosthetic abutment screwed into the Connect and the resin crown.

Discussion and conclusion

The concept of the immediate 'one abutment-one time' abutment protocol gained clinical acceptance after it was acknowledged that repeated rupture of the gingival seal was leading to crestal bone resorption [1, 3, 8, 13, 15]. Implant manufacturers have therefore developed dedicated immediate tissue level abutments to be affixed during surgery with the objective to move the prosthetic working plane away from the crest, thus avoiding any further damage of the epithelial attachment, either during the various steps of impression-taking or during prosthetic fitting in.

Immediate tissue level abutments like the Connect have been developed by manufacturers with a per-operative intent and with the objective of no more being removed after seating. Their recommendations refrain the clinician from implementing this type of abutment in indications other than within the frame of the 'one abutment-one time' protocol.

The aim of the present article was to open and expand the indication span of the ITLA item. The objective is to show that placement of an ITLA is appropriate at two distinct time junctures. First is intraoperative as recommended by the manufacturers to follow the "one-time abutment" concept; advantage is that pristine integrity of the muco-epithelial seal obtained after soft tissue healing is kept untouched over time. Second is at the end of the osseointegration period according to a one-stage transgingival healing protocol; at that occasion the healing abutment is unscrewed, the gingival seal is violated and the tissue level abutment is affixed to the implant neck. However, this will be the only time that the epithelial attachment will be damaged. Studies [11, 9] have shown that 2–3 repeated ruptures of the attachment caused only slight bone loss, in the range of 0.16 mm, with no clinical significance or consequences. Therefore, although not strictly following the one abutment-one time concept, placing the ITLA after having damaged the muco-epithelial seal only once is still in line with the pristine concept of preserving the integrity of the bony crest from a significant apical resorption. Advantage of placing the ITLA at the end of the osseointegration period is threefold: 1) After soft tissue maturation the prosthodontist can choose the ITLA height size that best suits the local soft tissue thickness; sometimes during implant placement it is rather difficult for the surgeon to anticipate the final thickness of the gingiva. 2) The item the prosthodontist places instead of the removed healing abutment is clean and sterile, it arrives from the manufacturer. The healing abutment which has been in place for several months has become contaminated with bacteria [4]; putting it back after impression-taking into the implant neck in contact with a soft tissue that has been weakened by hemi-desmosome ruptures and which is often bleeding can only contribute to increase the bacterial load in the emergence profile area. 3) Similarly, the temporary or final prosthesis that arrives from the dental technician lab is neither perfectly clean nor sterile [5]; most often it is placed in contact with the weakened soft tissue of the emergence profile following a brief dental office cleaning procedure [5] if any [6]. Placing a non-contaminated component in contact with the soft tissue can only be an improvement to conventional procedures. The prosthetic parts prepared subsequently by the dental technician will then be placed in contact with a healthy healed gingival tissue.

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

A shorter version of this article/clinical case was published in L'information dentaire n°23/12 June 2019.

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Advantages of the Connect immediate tissue level abutment are as follows:

1) The 'one abutment-one time' concept and protocol can be easily implemented, disConnection and reConnection are completely eliminated.
2) It turns a 'bone level' implant into 'tissue level' implant. The mucosal seal formed during initial tissue healing is no more disturbed by any prosthetic manipulation.
3) The conical ITLA-implant neck connection leads to an optimal seal at the implant-abutment junction situated at immediate proximity of the bony crest.
4) Impression taking is made simpler, this is a real advantage for the general practitioner restoring implants. Whether impressions are conventionally or optically acquired, the impression coping-Connect-connection is flat; it is easier to manage than a conical connection.
5) The component coming in close contact with the soft tissues is clean and sterile; it emanates from the manufacturer's stringent cleaning and sterilization process. Such an uncontaminated state is rarely achieved when an abutment returns from the dental technician lab [5].
6) A higher torque is exerted to seat it which prevents loosening. Fatigue testing of the Connect-implant neck connection has shown that the unscrewing torque needed to loosen it was higher than the torque needed to tighten it by 85% [12].
7) Need of a healing abutment is eliminated.
8) Shape is slimmer than a MUA abutment; it is minimally bulky and appropriate for single restorations.
9) The screw-retained mode can be considered for any type of prosthesis; this skirts the diffusion risk of excess cement linked with cement-retained prostheses.
10) When the biotype is thin, a more aesthetic result is obtained due to the golden tone obtained by anodization of the item [14].
11) In a plural restoration, the Connect-prosthesis connection allows compensation for axial divergences of up to 40°.
12) If the ITLA is a one-piece item like the Connect, there is no passage for bacteria at the implant neck level at immediate proximity of the bony crest. If the ITLA is a two-piece item bacteria might reach the ITLA-implant neck junction and come in contact with the bony crest [7].

Dentaurum Implants has reason to celebrate

25 years of know-how in implantology

2020 is a very special year for Dentaurum Implants: The specialist for dental implants, based in Ispringen, Germany is celebrating its 25th anniversary. Along with its parent company Dentaurum, the oldest family-run dental company worldwide, Dentaurum Implants has much to offer: quality products manufactured in-house, digital solutions and a wide range of services and courses. “Made in Germany” forms the basis of the company philosophy, together with constant research and development and a close cooperation with universities and customers. Customers can look forward to some special offers over the coming months.

It became official on 26 July 1995: Tiolox Implants GmbH was entered into the German Commercial Register – the company is now well known under the name Dentaurum Implants. From the very start of implantology, the management recognized the positive development worldwide and the potential of implants for modern dentistry. The Tiolox implant system was added to Dentaurum’s range of products with the acquisition of the implant division of Cerasiv. This helped the Dentaurum portfolio become one of the widest-ranging assortments in the dental market, with complete solutions for patients and users.

The company extended its range of implants in 2015 to include its latest development: Cito mini, an implant with a reduced diameter. It is a system of one-piece implants that allows minimally invasive insertion in only 3 steps. As many implant cases can be loaded immediately, patients – especially edentulous patients – can enjoy their new quality of life a lot sooner.

tioLogic Twinfit was launched at the IDS 2019 and sets new standards in the field of implantology. The user can look forward to a patented implant 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 revolutionary Abutment Switch, one and 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 patented tioLogic Twinfit implant system with all of its components is designed to suit a digital workflow.

As a digital partner, Dentaurum Implants places value on process sequences that are efficient and easy to follow, using materials that have been validated – from scanning through to manufacture. The system offers solutions that are flexible, efficient, and tailor-made for the patient. Comprehensive services and a wide range of courses round this system off.

More information
www.dentaurum-implants.de

Mastering the esthetics

Together with their team of recognized experts, in last November, Professor Christoph Hämmerle and Professor Ronald Jung streamed a special online masterclass in cooperation with Nobel Biocare directly from the Center of Dental Medicine at the University of Zurich.

Addressing a key point in dental surgery nowadays, how to treat challenging aesthetic cases, the team led the participants through a patient's journey, from diagnostic, treatment planning to procedure and closure utilizing a very interactive dynamic platform.

Dr Alexis Ioannidis started the session with his lecture about the digital data acquisition for diagnostic and therapy planning of digital implants, generating a quite interesting discussion during the open session later. Then, streaming directly from the OR, *Professor Jung* mastered the surgery on a patient, featuring a very challenging case in the central incisor. Several techniques were shown during the surgery, especially on the use of bone graft material (L-technique) to support implant placement and long-term stability.

After a brief break, an open forum discussion took place where the case was discussed in detail. Experts from various disciplines at the University of Zurich such as *Professor Mutlu Özcan*, Professor *Daniel Thoma*, and *Dr Sven Mühlemann* (Senior Teaching and Research Assistant) discussed in depth issues such as the selection of prosthetic materials, GBR and GTR techniques, digital workflow and gave valuable tips & tricks for the treatment of challenging situations in the esthetic zone.

This online session is the beginning of a journey that the University of Zurich has started in collaboration with Nobel Biocare and that will be continued next year with an onsite event already planned from 28 to 30 October. Judging by the quality and high educational level of the recently conducted online session (which was attended by 50 participants from different countries), the onsite event seems to be the perfect context for advanced dental professional to continue their journey on developing their education and master current challenges in aesthetic dentistry.

More information
www.nobelbiocare.com

The place to be in 2022

EuroPerio Congress has established itself as the world's leading congress in periodontology and implant dentistry. Organized by the European Federation of Periodontology, the congress features a rich and varied scientific programme, featuring interactive sessions, live surgeries and much more. The programme includes more than 120 top speakers from all over the world who are masters in the field of Periodontology and Implant Dentistry..

The notable success of previous EuroPerio congresses has been striking, from their relatively modest beginnings to the great clinical, scientific, and commercial success of EuroPerio7 in Vienna 2012, which attracted more than 7800 registered participants.

EuroPerio8 in London 2015 broke all previous records and the recent edition of EuroPerio9 in Amsterdam 2018 reached more than 10.000 participants for the first time. Along with increasing participant numbers, EuroPerio's profile has steadily risen, turning it into the "world's leading congress in periodontology".

Every three years, another city and another committee are organizing that event. The venue for EuroPerio10 in 2022 is the Bella Center Copenhagen, Scandinavia's largest multifunctional event venue which has 40-year long track record of hosting successful international congresses. Registration will open in spring 2021

EuroPerio
An EFP initiative SPRING/SUMMER 2022 COPENHAGEN

More information
https://www.efp.org/europerio10/.

EAO Digital Days

An outstanding online event

The Annual Scientific Meeting of the European Association for Osseointegration always represents one of the highlights of the year in implant dentistry in Europe. This year's congress (EAO Digital Days) originally scheduled to be held in Berlin, Germany, has used a completely new digital format, offering a brand-new experience to share high scientific content through a dedicated online platform. Due to pandemic restrictions, the organizers decided to transform the format of the congress into a digital one that would allow both unlimited dissemination of scientific content and interactivity. The entire program was adjusted to create a scientific conference structure in a virtual environment. The new conference format not only provided new and fascinating content but also delivered it in a way that has not been seen before.

Under the motto: "From Berlin to digital", the EAO Digital Days were broadcast during four evenings (allowing participants to join it after work) from 5 to 11 October from 7 pm to midnight (CET) from the studio in Paris and provided a variety of live lectures, interactive interviews and on-demand videos.

The event was not just a compilation of webinars, but it reflected the complete structure of a scientific conference in a virtual environment. All attendees had full access to eight different channels that provided abstract sessions, e-poster sessions, virtual exhibition booths, sponsors' lounges and EAO membership lounges that attendees could choose from.

On the main channel, Channel 1, which was structured like a TV show, the core scientific content was broadcast. Focus sessions guided by a moderator provided clinical and practical knowledge, and expert question sessions that, in addition to providing expert knowledge, offered the possibility of audience interaction.

The focus of each of the four evenings were surely the prime-time debates in which a group of experts gathered and discussed certain topics. Short "champion" stories told by scientists and clinicians were lighten up the evenings, which will be concluded by a late-night show featuring an eminent person from the implant dentistry community.

There was so much input and interesting discussions, and also many highlights.

A great area of innovation which was discussed was biotechnology, including the latest developments in bioactive and anti-infective implant coatings. *Bilal al Nawas* (Germany) presented the progress that bioprinting has made in tissue repair and reconstruction in deficient areas.

The clinical performance and biological complications of ceramic implants seem to be considered a topic for the future. *Benedict Spieß* (Germany) and *Ausra Ramanauskaite* (Lithuania) talked in their focus session about the complication management on ceramic implants.

Among the prime-time debates, the discussion moderated by *Luca Cordaro* (Italy) from the Milan studio certainly stood out. There are several options to rebuilt, stabilize the bone and increase ossification. The experts *Matteo Chiapasco* (Italy) on autogenous bone graft, *Jesús Torres Garcia-Denche* (Spain) on allogenic graft, *Mario Roccuzzo* (Italy) on titanium mesh, *Istvàn Urban* (Hungary) on membranes had the consensus on the fact that in case of a complex bone defect the stage augmentation is the best solution.

The late-night shows with a high entertainment factor certainly inspired the younger generation with their special kind of interviews and funny challenges. Under the motto What you always wanted to know what you never dared to ask, world-renowned specialists have given much praise from their lives, careers, and stories. Like *Franck Renouard* (France) who is a pilot, wine producer, horse rider, cook, specialist in stress management, and dentist.

Regarding the manufacturing techniques for restorations, *Bjarni Pjetursson* (Iceland), *Markus Blatz* (USA), *Malin Strasding* (Switzerland) and *Daniel Wismeijer* (Netherlands) debated about 3D printing and its impact on dentistry, clinical applications and outcomes.

In a discussion on something which is rarely a topic, like failure, *Isabella Rocchietta* (Italy), *Gerhard Iglhaut* (Germany), *Arthur Novaes Junior* (Brazil), *Ignacio Sanz Martin* (Switzerland) and *Andy Temmerman* (Belgium) gave insight in how to repair soft tissue defects and how to manage failure.

Kristin Heimisdottir (Iceland) talked about the ongoing controversies about implant placement in growing individuals and treatment planning concerns.

This unique congress was a great success and surely paved the way to other similar online events.

AI

12th Annual Osstell ISQ Symposium

Experience sharing from real clinical cases

Demands for optimal implantological treatments need to be met through simple, objective tools and patient- specific decisions. With today's new and innovative techniques, reductions in treatment times as well as opportunities for medically compromised patients to have successful implant therapy have improved significantly. With its online Symposium in September 2020, Osstell gives input how to use Osstell ISQ diagnostics to optimize treatment decisions.

The speakers in the symposium represent more than 50 years of combined experience in clinical practice and presented and discussed the use of Osstell ISQ diagnostics in various treatment indications, illustrated by cases and clinical evidence.

The symposium started with *Dr Raquel Zita Gomes* (Portugal). The main aim of her lecture was to present and discuss the loading protocols (delayed, early, immediate) in modern oral implantology, and to create guidelines for daily decisions having in consideration objective measures like the implant stability quotient (ISQ) measure, the torque and the bone density measured in the TC/CBCT.

Professor Daniel Buser (Switzerland), one of the most experienced international implant surgeons, gave input on how to use Osstell ISQ values to shorten implant healing periods in daily practice and load the implant already after 2 months in SFE procedures. He presented various clinical applications, in which Osstell ISQ values are routinely measured, which will be documented with typical case reports.

Dr Nicole Winitsky (Sweden) attended a very interesting topic: implants in young adults. Her lecture highlighted both clinical and scientific matters regarding implant treatment in this group of patients who need both extensive implant treatments with fixed partial dentures and single implants. The question is how do these treatments perform long term regarding success and survival, marginal bone levels, complications and infra occlusion in young adults.

Dr Scott Ganz (USA) who has been voted one of the "Best Dentists in America" asked the audience: "Do You ISQ? Everyone Should". State-of-the-art imaging modalities and treatment planning software in implantology provide clinicians with an accurate assessment of potential implant receptor sites for successful free-hand or guided surgery, yet used alone, may not be accurate in predicting when an implant can be loaded, or diagnose the health of a previously placed implant. Insertion torque values have been widely accepted as an indicator for implant stability but they are highly subjective and may lead to premature loading. Resonance frequency analysis (RFA) and implant stability quotient values (ISQ) have been proven to provide objective measures at time of placement and can monitor the progress of osseointegration over time.

The symposium successfully ended with a live surgery performed by moderator *Dr Marcus Dagnelid* (Sweden) and a panel discussion where questions from the audience were answered. All the lectures are available on osstellcampus.com.

Osstem Implant opens global hub for research and development in Seoul

World-class dental technology center

Osstem Implant, one of the world's major dental implant manufacturers, has recently established a new state-of-the-art research and development (R & D) centre. Located in Seoul, South Korea, the centre will serve as a hub for providing next-generation fully digital solutions, thereby strengthening the company's position in the global dental implant market.

Top dental technology complex

The new R & D centre was built with an investment of over 63 million Euros and opened on 30 July 2020. Together with the current manufacturing centre, the Orange Tower in Busan, it will function as the R & D centre as well as the global corporate headquarters of Osstem Implant. With the new global R & D centre, the company now has its full infrastructure all in one venue in order to enhance R & D, as well as to improve collaboration between other departments such as quality regulation, licensing, marketing and administration. The new R & D centre will contribute towards achieving Osstem Implant's vision of becoming the leader in the global dental implant industry. It is expected to be a next-generation dental complex that incorporates the latest technologies.

Accelerating R & D synergy

Osstem Implant has been consistently developing R & D as the key to its competitiveness. "As research is the core element of the company, we are investing over 7 % of sales revenue in R & D annually," said Dr Tae-Kwan Eom, CEO of Osstem Implant. At the new R & D centre, the company will bring together researchers from its ten other research centres and hire over 500 additional experienced researchers. On 31 July, Osstem Implant was listed among this year's 100 best companies to work for by the South Korean Ministry of Employment and Labor.

Inviting dentists to the site of cutting-edge education

Osstem Implant has been striving to enhance the clinical implant knowledge and treatment capabilities of dentists. The company has invited over 12,000 South Korean dentists and 1,000 dentists from other countries around the globe to undergo in-depth clinical training and education at the new site.

SEPA – Oral Reconstruction Foundation Regenerative Symposium

Live further education with renowned experts

The SEPA – Oral Reconstruction Foundation Regenerative Symposium, which took place this past October 2020 , as part of the Sepa OnAir2020 Congress, brought together leading international experts in the field of regenerative surgery, to celebrate a series of practical and educational activities.
This Gold Symposium, a cooperation between SEPA and the Oral Reconstruction Foundation with the support of Biohorizons Camlog, had distinguishing features that made it an extraordinary event.

World-class experts offered virtual master sessions featuring novel regenerative concepts for soft tissue augmentation and improved healing. This event was simultaneously translated from English into Spanish, German, Italian and Portuguese.

The overview of the program included *Dr Juan Blanco* focusing on the biological aspects of new soft tissue augmentation materials followed by a presentation on the biological and clinical rationale behind the use of these innovative materials in daily practice based on the latest research results, presented by *Professor Anton Sculean*. *Dr Andrés Pascual* presented clinical cases showcasing the indications and step-by-step procedures applying a novel regenerative porcine acellular dermal matrix. In the following extensive expert discussion moderated by *Dr Mariano Sanz*, *Drs Gerhard Iglhaut*, *Ronald Jung* and *Marc Quirynen* shared their expertise on soft tissue augmentation and the state of the art for the different indications and the role of the new biomaterials.

An innovative addition to this symposium was the celebration of concurrent hands-on workshops in Lisbon, Madrid, and Barcelona on Friday 30 October.

Under the supervision of *Drs Juan Blanco* and *Olalla Argibay*, who were virtually connected from Santiago de Compostela, and with the support of local instructors to include *Dr Susana de Noronha* in Lisbon, *Dr Andrés Pascua*l in Barcelona and *Dr Ignacio Sanz* in Madrid, the attendees followed a live-surgery by *Dr Juan Blanco* and were trained on soft tissue augmentation around implants with the novel porcine acellular dermal matrix. Virtual participation in this hand-on workshop was also possible to a limited number of participants.

Dr Mariano Sanz introducing Dr Anton Sculean

More information

www.orfoundation.org
www.biohorizonscamlog.com
www.henryschein.com


Attendess in Barcelona during the hands-on-session

Koelnmesse's #B- SAFE4business campaign

Implementing hygiene protection

The International Dental Show (IDS) 2021 is taking the coronavirus crisis as an occasion to rethink its trade-fair philosophy and adapt to new requirements. IDS 2021 is therefore designed as an open forum that makes networking as secure and successful as possible. Koelnmesse has developed a series of hygiene and safety precautions and has recreated them on 5,000 square meters of the exhibition grounds. The prototype of a trade fair (#B- SAFE4business Village) was set up in Hall 9, where the entire customer journey was replicated.

Human Security Radar (HSR)
Body scanners facilitate contactless, corona-compliant, security checks. The HSR system is used at the entrances to the exhibition centre, creating a free-flow system that enables security checks on thousands of people per hour. It detects improvised explosive devices, firearms and other weapons and is perfectly suited to support physical distancing and low-contact security screening. The separation of entrances and exits, circumferential spatial demarcations against the aisle and distance markings in queueing areas regulate the observance of the 1.5-m minimum-distance rule.

eGuard
The new eGuard smartphone app ensures professional security at the highest level. In order for the app to provide accurate information on visitor density at the event location, its use is mandatory for all persons in the exhibition halls throughout the event and must be kept active in the background on the smartphone. No personal data are recorded.

The app gives users an opportunity to stay away from halls with high visitor density. It also enables security teams to act when larger groups of people are to be avoided or must be broken up.

Hygiene Guard
To ensure that the prescribed hygiene standards are maintained at all stands, Koelnmesse has developed the role of Hygiene Guard. Depending on the wishes and specifications of the exhibitor, the trained hosts are tasked with, for example, checking for compliance with the hygiene regulations when entering the stand, such as covering the mouth and nose, detecting symptoms (forehead temperature measurements with leased devices), hand hygiene and upper limits on the number of visitors.

Cleaning concept
Koelnmesse offers professional disinfectant cleaning by specially trained uniformed specialists in accordance with the latest hygiene standards. In critical areas such as contact surfaces, this entails an increased cleaning frequency with surface, spray and wipe disinfection.

Conception and construction of entire event formats
Koelnmesse's stand construction team is a single-source service for the design of areas, halls or entire events, ensuring a uniform and attractive design. Exhibitors enjoy inexpensive and simple participation options in addition to individual design options through graphics, logos, video, etc.

Camera-based people-counter system
The system allows the easy recording and regulation of visitor flows at the stand. A visitor guidance system can be implemented with the help of several cameras and displays, as well as optional distance detectors including the triggering of warning messages and the optional display of individual content (advertising, product availability).

Reviving the trade fair business is essential not only for Koelnmesse. As the leading global trade fair for the dental industry, IDS plays a decisive role in successfully relaunching the dental business in this pandemic. The comprehensive #B-SAFE4business measures offer the best possible conditions for a safe, personal exchange of ideas, delivering decisive impulses for a "reset". ■

Digital solutions for a successful trade fair presence

Photos: Koelnmesse GmbH, Harald Fleissner

Dental clinic of the future

Succeeding in an extensive project with a competent partner

With more than 50 employees, Zahngesundheit Frechen is one of the largest dental clinics in the Cologne region in Germany. The clinic owners Yvonne Reinartz, Dr Jürgen Schmitz and Maximilian von Kleinsorgen work alongside six other dentists to provide dental treatments for their patients. The clinic, specialised in orthodontics, implantology, aesthetic dentistry and dental prophylaxis, recently expanded to a second location close to the main clinic, increasing the number of treatment rooms by five.

Maximilian von Kleinsorgen

Maximilian von Kleinsorgen reveals why the owner trio decided to invest in Planmeca as they were expanding their clinic.

"When it then became possible to expand our clinic with five new treatment rooms across the street, we quickly made the decision to seize the opportunity and started planning the expansion with our long-time partner NWD," *von Kleinsorgen* tells.

The dental team at Zahngesundheit Frechen has high requirements for new technology and emphasises innovative ways of working. This was also the foundation for planning the five new treatment rooms. Therefore, the owner trio decided to rely completely on Planmeca in equipping the new rooms with modern technology.

"Internally, we have always talked about a 'Future Clinic', because we want to show what is possible in dental care. We already had Planmeca's imaging devices and intraoral scanner at our main location, and we liked the company's idea of connecting all the devices together. As we wanted to develop our digital workflows even further, we decided to go with Planmeca for our clinic expansion," *von Kleinsorgen* explains.

The treatment rooms at the dental clinic are now full of new technology. *Maximilian von Kleinsorgen* names the Planmeca Emerald S intraoral scanner as his absolute favourite. According to him, the scanner offers excellent image quality at an affordable price while also providing "a playground" for digital dentistry.

"Digital impressions were introduced already several years ago and have become an industry standard. I have fun testing what is possible beyond the usual standards. This I can do with Planmeca Emerald S and its open file formats," *von Kleinsorgen* states.

"With the recently installed Planmeca Solanna Vision operating light, we can also record treatments using the operating light's integrated cameras and display the procedures with the projector in our training room."

Expanding a dental clinic with five new rooms is an extensive project, especially alongside normal daily clinical work. Zahngesundheit Frechen succeeded in the project in only six months, although they did need to resolve a few unexpected issues along the way.

"As both of our clinics actually belong together and have one client base, we wanted to have all our files on one and the same server. We asked our local telephone company what it would cost to connect the clinics with a fixed network. The price was astronomical, though," von *Kleinsorgen* reveals.

"However, we were able to solve the issue ourselves. We currently synchronise the data from both clinics over a WiFi connection. The files from the new clinic are transferred across the street with the help of point-to-point bridge technology and saved on the server at our main location."

Maximilian von Kleinsorgen offers a piece of advice for colleagues who are considering expanding their clinic. "Be creative and try thinking outside the box. I personally recommend turning to a trusted partner with your concept ideas and searching for suitable solutions together with them."

The benefits of the ozone in dentistry

Under COVID-19 crisis time, several countries' guidelines are mentioning a potential threat coming from aerosol generated by dental devices such as turbines, micromotors and ultrasounds. To protect both clinicians and patients it is imperative to prevent the spread of aerosols in the dental practice, in order to enable a safe and dynamic use of the mentioned devices in the daily clinical activity.

Mectron strongly believes it is necessary to provide the customers with a new proposal dedicated to Piezosurgery and prophylaxis units.

The main goal is taking advantage of the antipathogenic effect of ozonated water. Ozone gas has a high oxidation potential, which is 1.5 times greater than that of chloride when used as an antimicrobial agent against bacteria, viruses, fungi, and protozoa.

With this aim, Mectron introduces OzoActive, a device specially designed to generate ozonated water at a concentration range that is very safe for both patients and operators. OzoActive can be used with Piezosurgery units as well as with prophylaxis ultrasound units. OzoActive generates ozone gas for distribution into the irrigation lines of Piezosurgery and ultrasound units, resulting in concentrations of ozonated water ranging from 0.011 mg to 0.079 mg per liter. At this concentration range, ozonated water is proven to have biocidal effects.

The use of ozone is proven to be effective against viruses. The mechanism behind this is the disruption of the lipid envelope of the virus, inhibiting its ability to attach to host cells. Dedicated irrigation lines have been developed to connect OzoActive device with Mectron Piezosurgery and ultrasounds range. Piezosurgery irrigation set will be disposable while the prophylaxis set will be multi-use. Both the units (Mectron device – OzoActive) have to work simultaneously, that's why a unique foot-pedal has been developed.

The ozone level of OzoActive needs to be selected according to the specific irrigation level of Mectron devices.

Pre-established programs managed by means of a dedicated display will be already included on OzoActive software. ■

More information
www.mectron.com

Astra Tech Implant EV

Dentsply Sirona has an extensive product and solutions portfolio for all phases of implant dentistry, and as the recent launches of Azento, Astra Tech Implant EV and Acuris show, the company intends to remain an innovative leader.

"Everything we put on the market is based on the needs of the customers, well-documented and clinically proven", says Gene Dorff, Group Vice President at Dentsply Sirona Implants.

Making the work flow, as the initiative is called, revolves around identifying the smoothest and most convenient workflow for each customer. In addition to the vast assortment of products and solutions for implant treatment, there is also the full offer of the Dentsply Sirona portfolio. The Astra Tech Implant System just got even better – with the new Astra Tech Implant EV. As one of the most well-documented implant systems in the market today, it continues to evolve and provide great clinical benefits.

The revised implant design change of the Astra Tech Implant EV comes with significant advantages – with a deeper implant thread design apically, facilitating primary stability

Since its launch over 30 years ago, Astra Tech Implant System has been one of the world's most documented dental implant systems. Ongoing clinical documentation demonstrates that Astra Tech Implant System provides surgical and prosthetic flexibility, maintains marginal bone levels, and delivers reliable and predictable clinical results as well as natural esthetics.

This implant system features pioneering and groundbreaking innovations that are the result of knowledge and understanding of the biological and clinical processes involved in dental implant therapy. ■

More information
www.dentsplysirona.com/implants

Interview with Dr Scott Ganz on the evolution of computer and interactive software utilization

Essential technologies in implant dentistry

Owner of a private practice for prosthodontics, maxillofacial prosthetics and implant dentistry in Fort Lee, USA, Dr Scott Ganz is considered one of the leading experts in diagnostics and treatment planning using CT and CBCT imaging modalities. Well published in various scientific and professional journals and a renowned speaker worldwide, he has served as a consultant for numerous companies involved with dental implants, imaging, and the high technology arena. On the Osstell Symposium, Dr Alina Ion from the EDI Journal had the opportunity to talk with Dr Ganz about the evolution and importance of technologies in implant dentistry.

Dr Scott Ganz

In your opinion, which are the technologies that are essential for implant placement and restoration?

Thank you for this question. I have been extremely fortunate to have witnessed and participated in the evolution of what we call the "digital" workflow in dentistry. I think there are two technologies that are essential for both the surgical and restorative phases of implant dentistry. The first technology lays the foundation for everything that follows and is absolutely necessary. I will not place an implant without 3-D imaging, cone-beam (CBCT) scan to provide a true assessment of the patient's actual anatomical presentation. The second essential technology is Resonance Frequency Analysis (RFA) which records objective values of implant stability known as Osstell ISQ – "Implant Stability Quotient". We can record these values at any time during the lifetime of the implant. They become a medical-legal entry into the patient's chart, revealing the history of the health of the implant.

Doesn't ISQ measurement become obsolete when digital planning and guided surgery are used?

These are all synergistic concepts and treatment modalities. My definition of "digital planning" is based on an accurate CBCT scan and is often combined with other digital technologies such as intra-oral scanning or digitized stone casts/impressions of a patient's existing anatomy, and intra-oral photography. Bringing these technologies together within the envelope of a powerful interactive treatment planning software like Blue Sky Plan allows the clinician to truly assess the individual presentation of each patient. These advanced tools provide enhanced diagnostic abilities to accurately plan for dental implants based on the desired restorative outcomes. To validate implant stability, we will always need an objective measurement at time of placement which of course is what RFA/Osstell ISQ provides for us. Therefore, Osstell ISQ will always remain an invaluable clinical tool for all clinicians who place and restore dental implants.

What are the advantages of 3-D implant planning?

That is a very broad question!! I have contributed to more than 15 textbooks and over 100 articles in the literature, all in an attempt to answer this question ...! The advantages are numerous but must include what happens before and after the CBCT scan is acquired. In many cases pre-surgical prosthetic steps should be taken to gain as much information as possible from the scan itself. The technology also allows us to plan for several treatment options based upon the needs and financial ability of the patient. When all the information has been fully reviewed and assimilated, these treatment plans can then be executed with a high degree of accuracy, taking the guesswork out of the equation, and should minimize potential complications regardless of whether guided or non-guided surgery is utilized.

Thank you for your time, Dr Ganz.

Tri Dental Implants Digital implant

TRI Dental Implants announced that it has received the CE-marking for the world's first digital implant. The matrix is the first approved dental implant specially designed for the new digital manufacturing technologies such as CAD/CAM milling or 3D printing. This distinct concept allows the planning of prosthetics directly on the implant, without using the abutment. To ensure unlimited design flexibility, restorations can be designed from screw-retained fully anatomical CAD/CAM single restorations up to multi-part bars and bridges can be planned and placed directly on the implant. No limitation of angulation and indication, no need for cementation and the special possibility of digitally planning soft tissue management, all this guarantees longevity and high aesthetic results.

"The CE-marking for the world's first digital implant is a significant achievement and a major milestone for TRI Dental Implants. The marking enables the company to market the digital implant in the EU member states from now on", said *Dr Stefan Hund*, CEO of TRI. In conjunction with the CE-marking, TRI will now conduct several long-term studies, including with the University of Zurich, and together with a team of experts, the first patients will be treated throughout Europe.

Product
Matrix/digital implant

Indication
Oral implantology

Distribution
TRI Dental Implants Int. AG
Bösch 80A
CH-6631 Hünenberg
Switzerland
tri-implants.swiss/

Bego Angulated Screw Channels

Product
Angulated screw channels

Indication
Dental implantology

Distribution
BEGO Implant Systems
GmbH & Co. KG
Wilhelm-Herbst-Straße 1
28359 Bremen
Germany
www.bego.com

From now on, Bego offers one-piece bridge and bar restorations for the anterior and posterior region made from Bego Titan Grade 5 and Wirobond M+ with angulated screw channels of up to 20° for a variety of implant systems.
The user can now individually select the alignment of the screw access channel within the prosthetic restoration from 0° to 20° to the implant position. The angulated screw helps avoiding excess cement residues even in difficult and aesthetically demanding situations and ensures an optimal occlusal emergence of the screw channel in the anterior and posterior region.
A special screwdriver (Dynamic abutment* screwdriver L24) is needed for the screw, which is used in conjunction with the angulated screw channel. ■

* This symbol is a commercial designation/ registered trademark of a company which is not part of the Bego company group

Geistlich Geistlich Bio-Oss Collagen 50 mg

Product
Bone substitute material

Indication
Dental implantology/
Bone regeneration

Distribution
Geistlich Pharma AG
Bahnhofstrasse 40
CH-6110 Wolhusen
Switzerland
www.geistlich-pharma.com/
dental

A little innovation can make a big difference: Geistlich Bio-Oss Collagen 50 mg has been developed especially for filling the gap in immediate implant placement and to prevent tissue loss after immediate implant placement.
Immediate implant placement typically results in a void between the buccal bone wall and the implants inserted.[1] Implants alone, placed without preventive regenerative measures into fresh extraction sockets, cannot maintain the ridge volume.[2,3] Studies show that after one year, 22 % of the ridge width and 1.7 mm of the ridge height are lost.[2]

In a study by *Cardaropoli et al.*, filling the peri-implant gap with Geistlich Bio-Oss Collagen and Geistlich Bio-Gide preserved 92 % of the original ridge width[2] and resulted in better soft tissue and bone tissue outcomes than immediate implants alone.[1] ■

References
[1] Girlanda, FF., et al. Clin Oral Investig. 2019 Oct;23(10):3885-3893. (clinical study)
[2] Cardaropoli, D. et al. IJPRD 2014;34:631-637. (clinical study)
[3] Vignoletti, F. & Sanz, M. Periodontology 2000 2014; 66:132–152. (clinical study)

Osstem Implant Digital Lab Analog

Product
Digital Lab Analog

Indication
Digital implant prosthesis

Distribution
Deutsche Osstem GmbH
Mergenthalerallee 35–37
65760 Eschborn
Germany
eu.osstem.com

Osstem Implant introduces its own Digital Lab Analog, boasting its accuracy and user convenience. It will provide substantial clinical advantages in digital workflow especially for fabricating esthetic porcelain build-up crown as well as multiple crown prosthesis.
Osstem's Digital Lab Analog exhibits two-piece structures with connecting screw, which enables easy settling in the correct position and maintaining of stable fixations.
Great precision of the library by manufacturer ensures the precise design of the site where Digital Lab Analog is to be positioned in 3D printed model. In addition, its exclusive 'Reamer' allows to compensate any minor errors, which can occur depending on the precision degree of user's own 3D printers.
To minimize possible usage errors, guidelines for checking the right connection in vertical level and hex direction are included in its original library, so users can do final check and be confident on the replica of the actual oral condition of the patient with implant placed.
Together with Osstem's all-in-one scanbody, Digital Lab Analog is now applied to all available libraries and can be used in any clinical circumstances. ■

MEMBERSHIP REGISTRATION FORM

I hereby apply for a membership in the BDIZ EDI
(European Association of Dental Implantologists)

Name: .....

First Name: .....

Country: .....

Zip code / City: .....

Street: .....

Phone: .....

Fax: .....

E-Mail: ..... @ .....

Homepage: .....

Date of Birth: .....

Practicing implantology since: .....

Member of other Societies:

☐ ICOI ☐ BDO ☐ DGI ☐ DGZI ☐ DGMKG ☐ EAO

Continuing education Courses: .....

.....

Fellowship status / diplomate status in implantology

☐ Yes ☐ No ☐ Organization .....

Entry in BDIZ EDI Directory: ☐ Yes ☐ No
(For information on BDIZ EDI Directory of Implant Dentists see overleaf)

The annual membership fee for:

FULL MEMBERSHIP

☐	Full member - clinical	345,00	Euro
☐	Assistant dentist / young professional (up to 5 years after graduation)	172,50	Euro
☐	Second membership / family member	172,50	Euro

EXTRAORDINARY MEMBERSHIP

☐	Co-operative Member (Professionals without practice and dental technicians)	165,00	Euro
☐	Students	non-contributory	
☐	Supporting Membership (Companies etc.)	530,00	Euro

Payment
Membership cannot be confirmed until payment is processed. Method of payment is by bank transfer. Please use the following banking account.

Commerzbank Bonn

Account Number:	310 144 100
Bank Code:	380 400 07
IBAN:	DE96 3804 0007 0310 1441 00
BIC:	COBADEFFXXX

Membership cards will be sent upon receipt of the annual subscription fee.

City / Date : .....

Seal / Signature: .....

Please return the completed registration form to:

European Association of Dental Implantologists e. V.
Mühlenstr. 18 • D-51143 Köln
Fon: + 49 (0) 2203-8009-339
Fax: + 49 (0) 2203-9168-822
E-Mail: office@bdizedi.org
Homepage: www.bdizedi.org

Calendar of Events

	Event	Location	Date	Details/Registration
01/2021	**15. International Conference on Dentistry, Dental Applications, Tools and Techniques**	Zurich Switzerland	14–15 January	www.waset.org
02/2021	**16th BDIZ EDI Expert Symposium ***	Cologne Germany	15 February	www.bdizedi.org
03/2021	**International Dental Show IDS**	Cologne Germany	10–13 March	www.ids-cologne.de
	Bernese Perio Winter Education Week	Saanen-Gstaad Switzerland	6–13 March	www.zmk.unibe.ch

* Please note: the congress date is subject to change on account of the COVID-19 pandemic.
Read the most current updates on the BDIZ EDI website: www.bdizedi.org.

Due to the Coronavirus spread, many events have been postponed or cancelled. Other events only take place online.
Please check the official websites or contact the organizers to see if the dates are confirmed.

EDI Journal – Information for authors

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

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

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

Illustrations and tables
Each article should contain a minimum of 20 and a maximum of 50 pictures, except in unusual circumstances. Our publishing house attaches great importance to high quality illustrations. All illustrations should to be numbered, have a caption and be mentioned in the text.
The photos should have a size of 10x15 cm, the image or graphic files must have a resolution of 300dpi. Tiff, eps and jpg file formats are suitable. Radiographs, charts, graphs, and drawn figures are also accepted.
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