

# digital

international magazine of digital dentistry

## case report

Overdenture solutions for today's economy

## trends & applications

Virtual reality and orthodontics:  
A new patient experience

## news

Artificial intelligence-based analysis  
of dental radiographs saves time in patient care

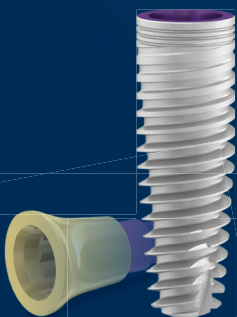
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Dr Scott D. Ganz

Editor-in-Chief



## COVID-19 times

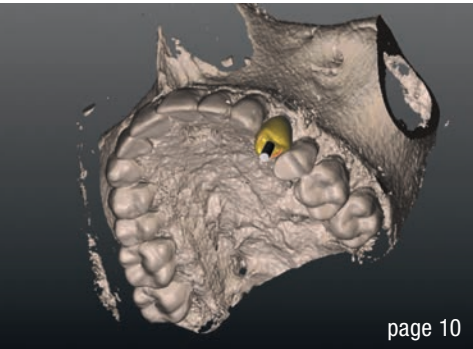
**Here we are in the autumn of 2020** in a situation that most of us would never have dreamed would happen. Our offices were closed for weeks and months owing to the global pandemic that has dramatically changed the way that we live, socialise, travel, interact, shop, eat, educate others and ourselves, and practise our profession. Major and minor meetings and hands-on workshops have been cancelled or postponed indefinitely. For many, the everyday practice of dentistry has been limited in many ways, including the need for extra personal protective equipment and enhanced infection control necessitated by the aerosol spread of the potent virus. Of course, this affects the clinicians who practise dentistry, our staff, dental laboratory technicians, industry suppliers, local and regional sales representatives, and many other people. To summarise, SARS-CoV-2 has influenced every aspect of our lives, becoming the new normal for everyone, as I indicated in our previous issue.

This is now several months later, and we are perhaps in the middle of a strong second or even third wave of infections. Regrettably, in many regions of the world, the response to SARS-CoV-2 has become political, many leaders not accepting the recommendation of scientists who traditionally have been evidenced-based truth-tellers. If there is one saving grace, it is our experience and understanding of technology and the tools that can help us survive this time of the pandemic with a little less pain—and this is especially true for the readership of **digital**.

Most of our educational venues have gone “virtual” – meaning that many of us are spending more and more time in front of our computer screens. We are now routinely interacting with our colleagues, associates, family members and others using remote communication technology on our computers or our incredible smartphones, which have become a universal means of instant global communication. Fortunately, in our profession, our digital workflows are already in place: we are used to sending and receiving files or interacting with a computer simulation, assessing a digital radiograph or CBCT scan, and working with software applications to review, plan and design treatment plan objectives. Within the confines of the current COVID-19 limitations, it has become apparent that those with enhanced digital skills will have a distinct advantage.

As always within the pages of this current edition of **digital**, you will find interesting articles, concepts, clinical applications and much more from some of the brightest minds and most talented clinical practitioners and educators in our profession. Please enjoy this latest offering while staying safe, practising social distancing, washing hands and wearing masks to protect those around you. Let us all do our very best to get through these difficult times of managing our professional and private lives with the anticipation that life will return to a pre-COVID-19 existence of normality, sooner than later.

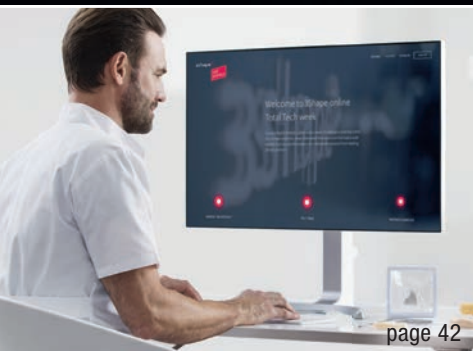
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75 $\mu$ m  
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# EAO Digital Days delivers online content in an entirely new way

By Franziska Beier, Dental Tribune International



Prof. Henning Schliephake is chair of EAO Digital Days. (Image: © Henning Schliephake)

**This year's** Annual Scientific Meeting of the European Association for Osseointegration (EAO Digital Days), which had been scheduled to take place in Berlin in Germany, has taken on a completely new digital format. EAO Digital Days was broadcast from 5 to 11 October and presented a colourful mixture of live shows and on-demand videos. Prof. Henning Schliephake, chair of EAO Digital Days and EAO president, shared how the organisers have jazzed up the programme in order to create a scientific conference structure in a virtual environment.

**Prof. Schliephake, many dental events have been cancelled this year owing to the SARS-CoV-2 crisis. What led to the decision to turn the EAO congress into an online event?**

This decision had to be considered very thoroughly and was extremely difficult to make, as the EAO congress represents one of the highlights of the year in implant dentistry in Europe. We had been expecting up to 5,000 participants however, and at the time of decision-making, the city of Berlin had prohibited events with more than 1,000 people in attendance. As a result, we would only have been able to make the

scientific content available to a very limited number of people. Moreover, even with that limited number of participants, rules such as social distancing, the wearing of masks and limited access to the exhibition area would have applied. As the unique atmosphere of our congress is based on lively interaction between all participants and speakers, both in the lecture halls and in the exhibition area during breaks, this would have severely damaged the nature of the congress and its educational character. As a consequence, we decided to transform the format of the congress into a digital one that would allow both unlimited dissemination of scientific content and interactivity.

**What has been challenging about turning the congress from an in-person event into a digital one?**

Maintaining the interactive character that I have just mentioned in a digital lecture session has been one of the challenges. Additionally, we were aware that, by the time EAO Digital Days was due to take place, most people would be quite sick and tired of watching the traditional type of webinar. Therefore, we had to develop an entirely new format that would catch the attention of the viewers

by not only providing new and fascinating content but also delivering it in a way that has not been seen before.

**What was new for attendees of EAO Digital Days who were used to the traditional format?**

First of all, the programme was broadcast in the evenings, allowing participants to easily enjoy the shows after work. Secondly, the event was not just a compilation of webinars; it mirrored the complete structure of a scientific conference in a virtual environment. Eight different channels provided abstract sessions, e-poster sessions, virtual exhibition booths, sponsors' lounges and EAO membership lounges that attendees could choose from. And thirdly, our flagship channel, Channel 1, broadcast the core scientific content and was structured like a TV show, running from 7:00 p.m. to 11:30 p.m. CET during the first four evenings. This channel presented focus sessions that provided clinical and practical knowledge, guided by a moderator, and expert question sessions that, in addition to providing expert knowledge, offered the possibility of audience interaction. The real heart of each of the four evenings was the prime time debates in which a group of experts gathered and discussed certain topics. Short "champion" stories told by scientists and clinicians lightened up the evenings, which were concluded by a late-night show featuring an eminent person from the implant dentistry community.

**What were some of the topic highlights?**

EAO Digital Days focused on three major areas. Firstly, we wanted to show the great potential of digital implant dentistry, but also its limitations. In order to do so, we discussed fully guided versus dynamic navigation and how to use digital data in complex interdisciplinary cases. Based on this discussion, the relevance to the relationship between practitioners and patients was demonstrated, and it was evaluated whether patients appreciate the improvements associated with digital implantology. A second area of innovation that was addressed is bio-

## “The real heart of each of the four evenings was the prime time debates”

technology, including the latest developments in bio-active and anti-infective implant coatings and the progress that bioprinting has made in tissue repair and reconstruction in deficient areas. In addition, we took on some of the ongoing controversies about implant placement in growing individuals and the combination of teeth and implants in prosthetic treatment concepts. And finally, we showed live soft-tissue repair surgeries, which were presented directly from the operating rooms and discussed by our expert guests in the studio.

**The EAO is an important association for implantologists and periodontists. Apart from moving the EAO congress to an online event, how is the EAO handling the SARS-CoV-2 pandemic, and how are you supporting your members in these challenging times?**

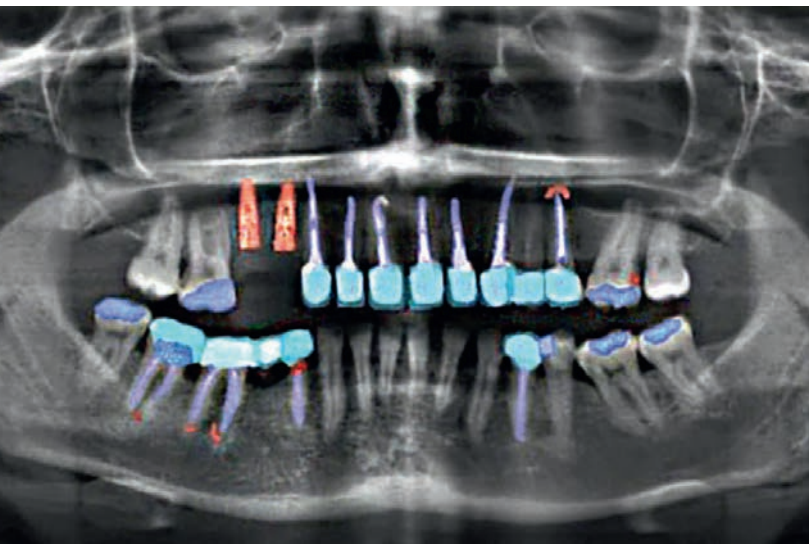
The EAO is committed to our members, and since all of them are affected by this pandemic, we try to provide support on different levels. We have offered expert knowledge on the management of dental offices and the treatment of patients under COVID-19 circumstances in a recent "Just Ask" session that is available online. Furthermore, we have devoted €50,000 for European research on the development of a vaccine against the virus in a crowdfunding approach. On the Friday of EAO Digital Days, we dedicated one session to an update on the management of daily work under conditions of COVID-19 and discussed matters such as protection measures.

*Editorial note: More information about EAO Digital Days can be found at [digitaldays.eao.org](https://digitaldays.eao.org).*



# Artificial intelligence-based analysis of dental radiographs saves time in patient care

By Dental Tribune International



A newly developed software program detects caries, infections and restorations such as crowns, implants and root canal fillings in dental radiographs and marks its findings in colour. (Image: © BIH)

**Dentists at Charité**—Universitätsmedizin Berlin, together with data scientists and programmers, have developed dentalXrai Pro—a software program that allows dental practitioners to perform the analysis of radiographs based on artificial intelligence (AI). The new software was designed to help dentists identify pathologies and restorations more accurately and in less time in order to provide optimal treatment and improve communication with patients.

Prof. Falk Schwendicke, chief medical officer and co-founder of the project and head of the Department of Oral Diagnosis, Digital Health and Health Services Research at Charité, said in a press release: “[dentalXrai Pro] raises dentistry to a standardised, high-quality level and immensely speeds up the analysis of X-rays, so that dentists can use the time more effectively for talking to patients”.

## Large data set of dental radiographs

Since most dental practices already take digital radiographs, these can be easily transmitted to dentalXrai Pro. In order to deliver a pre-analysed image within a very short time, the browser-based software accesses high-performance computers and a whole range of algorithms.

These algorithms are the result of in-depth software training using a very large data set of dental radiographs, including panoramic and bitewing images. Dentists from around the world identified tens of thousands of pathological changes and traces of previous dental treatments on the radiographs.

This data was then fed to the artificial neural networks, enabling them to distinguish between different findings, such as caries, infections and root canal fillings.

## dentalXrai as a digital second opinion in the dental practice

“AI is not responsible for the dental examination and does not reach decisions on the treatment,” emphasised Schwendicke. It does, however, facilitate the process for dental professionals and includes patients in the diagnosis. According to Schwendicke, this “second opinion of a digital colleague” helps to create trust between dentists and their patients.

In the coming months, the focus will be on sales. “We want to use our networks and find business partners who can bring our software to dental practices,” said Schwendicke. The project was funded by the Digital Health Accelerator of the Berlin Institute of Health (BIH). “We saw that the project had great potential and benefits for patients from the very beginning,” commented Thomas Gazlig, director of BIH Innovations.





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