

digital

international magazine of digital dentistry

interview

“Digital dentistry will set you apart”

case report

Immediate loading of post-extraction implant
in an area of high-aesthetic value

education

Digital impression taking in modern dentistry

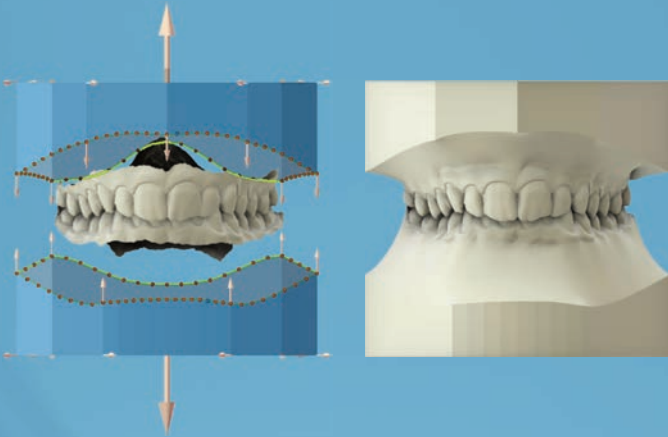
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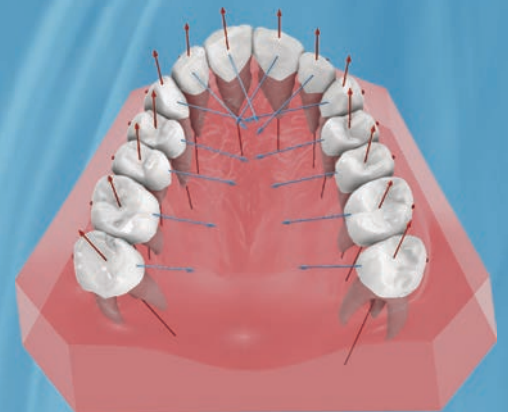


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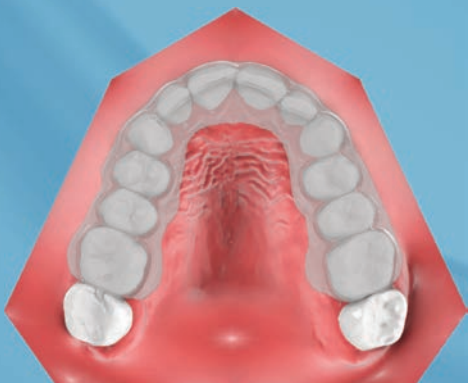
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Virtual Setup



Clear Aligner



Indirect Bonding



Dr Scott D. Ganz

Editor-in-Chief



The Summer Olympic Games 2021

Despite the ongoing saga of COVID-19 and a postponement from 2020, the Summer Olympic Games were held in Tokyo in Japan. What a wonder to watch these special athletes taking part in their chosen sport at the highest level of competition from over 200 countries around the globe. The incredible precision required of these athletes is a direct result of the many months and years of training required to refine their skills. Many of these exceptional people have participated in more than one Olympic Games, trying their best to be at peak performance at exactly the right time to excel when it counts, striving for a gold, silver or bronze medal. These athletes perform under extreme pressure against the best of the best, very little separating first place from second or third place.

Consider these examples. Caeleb Dressel won the men's 50m freestyle swimming final, which was decided by less than one half of a second, and the difference between second and third was 0.02 seconds! The men's 4 x 100m swimming medley relay race ended with times of 3:26.78 for first place and 3:27.51 for second place, a difference of 0.27 seconds! The final women's 100m sprint results were also decided by a very small margin. The first-place time turned in by Elaine Thompson-Herah was 10.61 seconds, a new Olympic record! Second place was only 0.13 seconds later at 10.74 seconds, and the separation between second and third was 0.02 seconds at 10.76 seconds! In women's gymnastics, Sunisa Lee narrowly won the all-around competition by posting a

score of 57.433, winning by less than 0.2 points over Rebeca Andrade, followed by Angelina Melnikova and Vladislava Urazova, both within 0.5 points of the lead. Regardless of the event, there is little room for error.

Dentistry too leaves very little room for error. We often deal with digital measurements that are within Olympic tolerances. Intra-oral scanners have demonstrated excellent accuracy, measured in microns, for conventional crown and bridge dentistry as well as for dental implant reconstruction with the implementation of scanning abutments. Dental laboratories digitise stone casts and impressions with desktop optical scanners which demonstrate excellent accuracy when utilised with advanced CAD/CAM software, milling devices and 3D printers.

It has been our mission within the pages of **digital magazine** to provide our readership with state-of-the-art concepts that demonstrate how technology can be incorporated into the modern practice of dentistry. As technology continues to evolve, the accuracy and consistency of the digital workflow will aid in reducing complications, remakes and chair time while increasing efficiency and patient outcomes. Dentistry will forever be challenged to achieve gold medals in all categories. Enjoy this current issue of **digital magazine**!

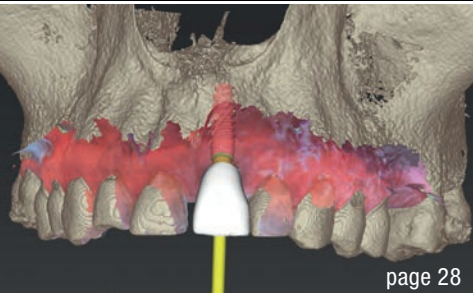
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The COVID-19 practice manager 2021: Four steps to confidence—Part 3

Chris Barrow, UK

In the first part of this series, we looked at the characteristics of great leadership and how this applies in the role of practice manager. In the second part, we looked at management and the checklist of systems required to run a modern-day dental business. In this article, I want to talk about teamwork: what makes an ideal team player and an ideal team, and how does the practice manager keep the right people?

Before I say another word, I am going to pay tribute to my inspiration on this subject, business author Patrick Lencioni, who has created excellent work on this subject. I am going to draw your attention to his books: *The Ideal Team Player: How to Recognize and Cultivate the Three Essential Virtues* and *The Five Dysfunctions of a Team: A Leadership Fable*.

In the first book, Lencioni sets out “three virtues” that are the behaviours that single out team players who are going to make a positive difference and he equally warns the reader to identify and avoid those who can become saboteurs in the organisation. In summary, Lencioni teaches us to recognise those who are hungry, people-smart and humble.

Hunger

People who are hungry are workaholics, but not simply for the sake of working. Hungry individuals are highly motivated, have a clear vision, and go above and beyond in accomplishing what needs to be done (and more) in making that vision a reality. People who are hungry do not need to be told to do some-

thing, because they actively seek out problems and solve them.

Individuals who lack hunger are not simply lazy. In fact, people who lack hunger can often accomplish tasks reasonably. The primary characteristic of those who lack hunger is a lack of passion and inability to see the big picture. These individuals might get work done when told, but rarely if ever seek out problems on their own and are the kind to quit when the going gets tough.

Smarts

Being smart is the most misunderstood of the three characteristics. In the context of the ideal team player, it refers to being people-smart.

Smart people pick up on social cues that others do not, more easily empathise with others, and are more capable of understanding the needs of others and acting accordingly. Smart individuals build stronger relationships with teammates because they understand intricacies in conversation that less people-smart individuals do not. Generally speaking, smart people are a pleasure to be around and are well liked by their peers.

Those who are not smart tend to be awkward and/or destructive in building relationships. These individuals have more difficulty communicating with others, and they generally have trouble understanding the needs and wants of their co-workers outside of day-to-day responsibilities in the workplace. Ultimately, these team players tend to cause personal, people, problems at the office due to their general inability to pick up on the repercussions of their behaviour.

Humility

The third—and arguably most important—of the three characteristics is obvious yet critical. Humble people build their team members up by sharing in successes and taking responsibility when appropriate for failures. Having humility means lacking an excessive ego and not concerning oneself with status, and humble individuals are quick to praise and slow to seek praise. Success is collective.

Lacking humility, on the contrary, means broadcasting personal achievements and downplaying the contributions of others. Those who are not humble tend to take on responsibilities with the primary purpose of boosting their own self-esteem, and they lack an awareness of the efforts of their team. It can be especially dangerous when an individual lacks humility and acts on personal greed while putting on a facade of caring about the team's success.

Interview questions. (Box 1)

Hungry

What is the hardest you have ever worked on something in your life?

What do you like to do when you are not working?

Did you work hard when you were a teenager?

What hours do you generally work?

Smart

How would you describe your personality?

What do you do that others in your personal life might find annoying?

What kinds of people annoy you the most, and how do you deal with them?

Can you give me an example of how you have demonstrated empathy to a teammate?

Humble

Tell me about the most important accomplishments of your career

What was the most embarrassing moment in your career? Or the biggest failure? How did you handle that embarrassment or failure?

What is your greatest weakness?

How do you handle apologies—either giving or accepting them?

Tell me about someone who is better than you in an area that really matters to you.

Great interview questions

Of course, these characteristics are not simply black and white, individuals clearly showing capability or otherwise. There are many nuances, and Lencioni explains in considerable detail how to identify the places between these

“...what makes an ideal team player and an ideal team, and how does the practice manager keep the right people?”



extremes. Ultimately, however, Lencioni advises that any deviation from wanting the best players will lead to long-term problems that will be increasingly difficult to manage.

One of my favourite sections of the book is a series of suggested interview questions, reproduced in Box 1. I can tell you from personal experience that I had to summon up some internal courage the first time I tried them, when interviewing a potential manager on behalf of a client. My fortitude was rewarded by a fascinating conversation with the applicant and a successful appointment to the new role.

In the second book, Lencioni develops the theme of great teamwork by looking at what goes wrong with

teams. He takes the reader through a series of steps to identify performance and behaviour that destroys teamwork:

- absence of trust;
- fear of conflict;
- lack of commitment;
- avoidance of accountability; and
- inattention to results.

In each case, suggestions are offered to overcome the dysfunction and build a cohesive team; in particular, the role of the leader in solving these problems is spelled out in clear detail.

In these two books, you have priceless resources available to help you to avoid and overcome many of the commonest problems in teamwork. Interviewing and selecting well will help you to recruit the right people.

But what of retention?

At the time of writing, there is not only a dearth of ideal people in the recruitment landscape but I am hearing every week from clients who are losing good people for a variety of pandemic-related reasons. Some examples from my inbox this week:

“The available supply of nurses, hygienists, therapists and associates is, quite simply, drying up.”

- the dental therapist demanding 50% of all fees collected before agreeing to join a practice;
- the client who has lost three senior team players, all of whom were headhunted by rival businesses;
- the micro-corporate who advertised for associates in three locations and has so far had just two CVs submitted, despite registering with three agencies;
- the owner who is worried that her 60% UK National Health Service fulfilment target cannot be achieved because her associate is abroad visiting unwell family, cannot get back and will have to self-isolate when back;
- multiple examples of team members taking maternity leave, leaving the profession for similarly paid jobs with less onerous working conditions, and following partners and spouses who have changed their career pathways;
- dental nurses choosing to leave full-time employment with one employer and sign on with locum agencies.

Unlike previous years, it is not going to be so easy to replace team members by zipping off to recruitment fairs in continental Europe—Brexit has put paid to that.

Furthermore, I recently noted a thread on LinkedIn suggesting that 5,000 dental nurses in the UK have deregistered during the pandemic, representing a loss of almost 10% of the UK nursing workforce—and they are not being replaced. The available supply of nurses, hygienists, therapists and associates in the UK is, quite simply, drying up. That means that the cost of hiring will increase; wages are going to go up.

It has never been more important, therefore, to start with retention; what do you have to do to keep the good people you already have? I predict that this will become the most serious challenge that we will face in the next 12 months.

Remuneration across the board will have to rise, and it is essential to pass those increases in variable and fixed costs on to patients in the form of price rises—otherwise your profit margins will be eroded. This means that we are going to have to come up with some language to explain to patients why prices are going to go up again.

However, it is not just about the money, and I would like to conclude by sharing with you my eight attributes of a confident team and workplace:

1. *Conditions:* The general terms and conditions of work and employment contracts are well defined.
2. *Culture:* The team share core values and a vision of how they want to serve their community. They publish promises and expectations around behaviours and always observe politeness.

“It has never been more important, therefore, to start with retention; what do you have to do to keep the good people you already have?”

3. *Communing:* The team meet socially (when permitted) for special occasions and to visit dental workshops, trade shows and conferences.
4. *Communication:* The team gather for daily huddles, weekly reflections, monthly management, quarterly training and annual business planning.
5. *Career:* There are pathways to progress for those who are hungry for more.
6. *Compensation:* Remuneration is above average and may include a performance-related element, and there are attractive employee benefits.
7. *Corporate social responsibility:* The business has an active corporate social responsibility programme, including people and ethics, environment and sustainability, and community and charity.
8. *Celebration:* Everyone feels appreciated for what they do, people are recognised for doing things right, regular personal progress interviews take place, and patient reviews and testimonials are shared.

Do not for a minute think that any of this is easy—quite the opposite—but an ideal team will fly higher and for longer and will make your role as practice manager a joy.

In the concluding part of this series, I will be looking at extreme self-care, making sure that the best possible version of you can turn up for work (and arrive home again!).

about



Chris Barrow has been active as a consultant, trainer and coach to the UK dental profession for over 24 years. His main professional focus now is through his Extreme Business company, providing coaching and mentorship to independent dentistry around the world via face-to-face meetings, a workshop programme and an online learning platform.

How dental providers can take action to benefit from data dentistry

By Monique Mehler,
Dental Tribune International

In our modern society, data has become a key resource that allows for the storage and analysis of important information which then influences how decisions are made or what offers are available. This approach also applies to health and dental care, where providers aim to deliver quality care by processing information generated about their patients—a trend that is currently called data dentistry.

In a recent study, Prof. Falk Schwendicke and Dr Joachim Krois, from the Department of Oral Diagnostics, Digital Health and Health Services Research at Charité—Universitätsmedizin Berlin, have investigated how the era of big data is changing clinical care and research.

According to the authors, many industries started to embrace the data-driven paradigm early on and realised that digitalisation, artificial intelligence and data-driven technologies will shape our future in ways that we might not yet be able to comprehend. In healthcare, however, and especially in dentistry, the understanding that data might help provide better, safer, more reliable, affordable and accessible care has only recently started to gain acknowledgement.

Schwendicke and Krois summarised three action items that help make full use of the potential of data dentistry for the dental community. The first action item is availability, refinement and usage of data. The authors stated that dental data silos need to be broken up and made accessible for integration and use in research and clinical care. Patient-derived routine data will make it possible to capture the socioeconomic, behavioural or environmental determinants of oral health. Researchers should also aim at attaining similarly large, prospectively and

purposely collected data. In this way, it will be possible to validate and enhance prediction models or simulations. Dental researchers should contribute to the development of data-driven applications as they have the necessary awareness of deficits and needs.

The second action item is demonstration of value and usefulness. Schwendicke and Krois say that data-driven healthcare is slowly permeating dentistry, although technological hurdles like high cost have limited its adoption. It will be necessary to increase the scientific underpinning of dental data-driven applications and demonstrate their impact for increasing overall health.

The third action item is education of the dental workforce. The authors state: “Educating the dental workforce and prioritising data literacy in future dental curricula as well as supporting a closer cooperation between dental and data science professionals to bridge inter-professional gaps will address a range of the described implementation barriers.” It will be necessary to enhance the infrastructure and processes for cross-discipline data exchange and use.

Overall, the authors concluded that there are many points that need to be addressed in order to successfully utilise data dentistry. But if done correctly and in a timely manner, this practice can result in more precise, personalised, predictive and preventive care.

Editorial note: The study, titled “Data dentistry: How data are changing clinical care and research”, was published online on 8 July 2021 in the Journal of Dental Research, ahead of inclusion in an issue.



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You have just been hacked!

Cybersecurity in the dental practice

Tom Terronez, USA

BEEP! Your alarm clock sounds. Initially it rings intermittently and gently, gradually working its way to the five-beep, get-out-of-bed-now sound needed to finally grab your attention. Your day is beginning like every other day. Your shower is hot. Your coffee is hot; and as always, you lack the patience to let it fully cool before taking that first sip ... ouch! Your commute is as normal as it has ever been. The parking spot you always park in is open, and your day serving patients is about to begin. Everything is unfolding just as it should. Now, fast forward 12 minutes, since that's the amount of time you need to begin your work process. You jiggle your mouse to wake your sleeping computer, still smiling while exchanging morning pleasantries with your office staff.

One glance back to your monitor and ... boom! Your computer is down. No programs load. Everything is locked up. You hear your co-workers outside your door echoing the same thing you just mumbled in your head: my computer won't work; something's wrong! It's like a scene from a bad movie; your worst fears suddenly realized.

As you contact your IT vendor in an attempt to bring your system and network back to life, the clock is ticking. Patients are arriving for appointments scheduled months in advance.

Finally, your IT person shows up. You're saved!

Well, actually there's bad news. After attempting to get your computer system back in operational mode, your IT professional informs you, "You've been hacked, and those data backups you've been running? Yeah, well they haven't been working! However, there is an option to access your data."

"At last!" you say. "Some good news on this already horrid Monday. What is it?"

"There's an option," your IT pro responds, "to pay a ransom to decrypt and access your data, and the fee will likely be just a bit over US\$10,000, but the process will take at least a week."

Now, if your IT specialist is worth his or her salt, he or she would also know that an instance like this one requires paying another seasoned professional to conduct a forensic analysis to assess whether an actual breach occurred. But just as you've heard on those late-night infomercials, but wait, there's more! Yes, in fact, there's much, much more. The financial impact from this incident stretches far beyond the ransom and breach analysis. Expenses

resulting from downtime and lost production may be far bigger burdens. According to an IBM-commissioned report, the average cost of recovering from a breach is US\$380 per patient, that is US\$760,000 for a 2,000-patient practice.

Cyberattacks happen very regularly. In fact, over the course of the last few years, the frequency has increased exponentially. Just how frequent are they? One occurs every 39 seconds to be exact. By the time you have finished reading the next few paragraphs, another cyber-attack will have been executed.

The big questions are these:

- What can you do to prevent such attacks?
- How does your practice function during the recovery process?

And the bigger—and immensely tougher—question is, what do you tell your patients?

Light at the end of this tunnel

Believe it or not, there is some good news that can come from a situation like this. The best news? It was completely preventable.

In this case, a properly configured secure network would have decreased by tenfold the likelihood of this incident happening. Having the proper security measures in place to thwart would-be attackers takes care of the vast majority of attacks.

On the off-chance that an attack was successful despite your existing defence system, an off-site, monitored backup or disaster recovery system would have allowed for the restoration of all of your data based on a snapshot taken just before the attack occurred. Let's say your last backup was successfully completed on a Sunday

“Cyberattacks happen very regularly. In fact, over the course of the last few years, the frequency has increased exponentially.”

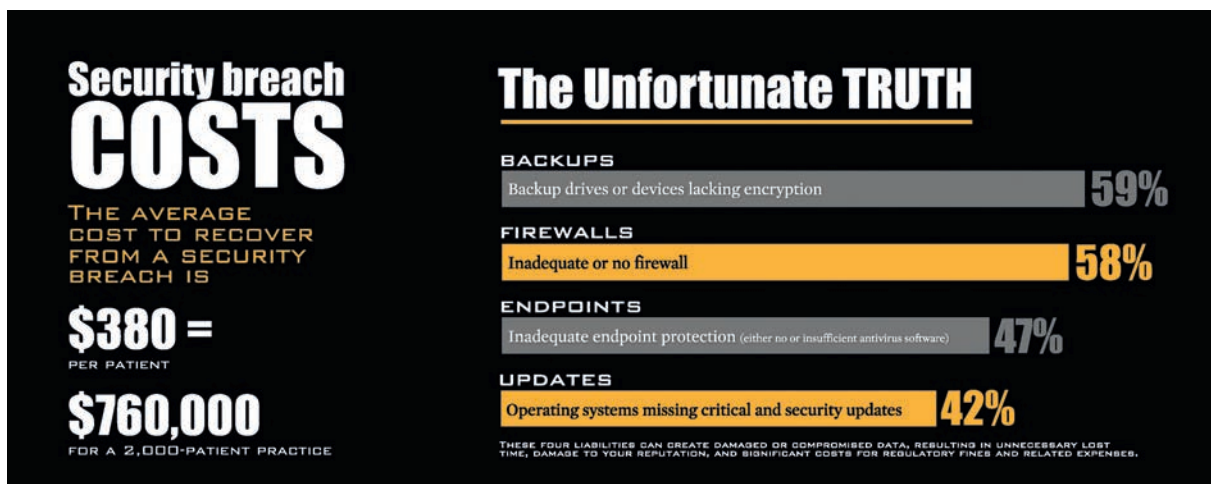
morning at 2:00 a.m. and the attack was made at 11:00 p.m. on Sunday night. Everything that was saved during that 2:00 a.m. backup would be stored in the off-site backup location, and this process would ensure total recovery of everything up to that point.

You're not off the hook

While multiple types of IT failure may create an environment which results in significant disruption that impacts your office routine, the responsibility and downtime are yours. It's your name on the practice. The patients are your patients. It's your duty to own whatever mistakes occurred.

While it's a bitter pill to swallow, accepting responsibility for the disruptive issues and being 100% transparent with your patients are imperative. Not only does this allow your patients to be clued of what has happened, but it also helps you maintain the credibility you've worked so hard to build up to this point.

One of the most effective ways to rebuild the patient practice trust is by communicating your plan to correct the issue which caused the situation. Your first corrective step should be to find a more reliable and effective IT vendor that has expertise in working with dental practices.





Don't be a victim— correct common IT issues

Let's face it. You're a practice owner, not an IT professional. You're not expected to be privy to all of the intricacies of the IT world. However, you are expected to—and absolutely must—know the basics in order to make an informed decision regarding the IT vendor best suited to protect your practice and in order to help you avoid IT disruptions to your practice.

Frequent backups

As outlined earlier, backups can be lifesavers, or, in this instance, data savers. Having a regularly scheduled backup system in place is an essential tool in keeping yourself protected. It doesn't stop there though. Knowing (and having a say in) what data is being backed up,

where the data is being backed up to and how long it will take to be restored are the crucial pieces of information you need to know.

Think of a backup as being your practice treasure. You wouldn't want to bury your practice treasure somewhere without knowing where to find the "X" which marks the spot from which you can recover it.

Windows updates

Security vulnerabilities are being discovered all the time. This means that, if you're not keeping your operating system up to date, you're harbouring big-time risks. Current security updates must be installed on all workstations and servers. Taking this precaution is critical.

For any of you still running Windows 7 and/ or Windows Server 2008, your hourglass is already empty! In January 2020, support for these systems discontinued, and no further patches or security updates are released. Your practice might be non-compliant already.

Antivirus/anti-malware

No free solutions exist to combat cybersecurity threats. Plain and simple. Enterprise-grade antivirus and anti-malware software programs are the only acceptable way to equip your practice for best protection. Find a reputable enterprise-grade provider that runs at least daily updates.

“Current security updates
must be installed on all
workstations and servers.
Taking this precaution
is critical.”

The normal antivirus applications designed for home use that you're likely accustomed to are unacceptable options for use in protecting your practice. Choosing one of these options is basically like arming your practice with Swiss cheese—there are just too many holes.

Staff training

Having the peace of mind that your employees—the people who are using your network on a daily basis—are properly educated in keeping your systems safe is invaluable. Cybersecurity training should be given annually at a minimum, but the ideal time frame is quarterly. Keeping up with new threats, trends and techniques goes a long way towards helping protect your practice.

Two big pieces of advice I always give to the practices I assist are:

1. Don't get click happy; slow down when browsing anything online and do not click without reading.
2. Don't open e-mail attachments unless you are 100% certain of whom the sender is and are expecting an attachment from this person or company.

Secure firewalls

Having a firewall is your first line of defence against Internet malice. However, don't be fooled; your practice needs much more than just a firewall, but a firewall is as important as antivirus/anti-malware protection. A practice without a firewall would be like playing chess without pawns acting as the initial barrier, blocking access to your royalty.

You may be thinking, managing each of those big-ticket solutions sounds great, but how can I accomplish all of them? That's a perfect question to ask, and the answer has several components. But it starts by understanding the importance of this short and simple quip, not all IT is created equal.

Just like in the dental profession, specialties exist in IT. One company that's great at solving problems may not have a security focus or may not have experience in that field at all. In many cases, general IT companies are far less equipped to protect your practice than a dentistry-specific IT company. Even then, just because a company identifies as a dentistry-specific IT vendor, it doesn't automatically mean it is expert in the security field. Identifying a dentistry-specific IT vendor that is a known expert in practice security is essential. Such vendors are like a rare four-leaf clover, and you're lucky when you find one.

While their fees may be more than those of the run-of-the-mill local general IT company, there's a reason:

“Don't open e-mail attachments unless you are 100% certain of whom the sender is and are expecting an attachment from this person or company.”

the expertise and quality they provide. Protecting your practice means protecting your patients. Patients who have placed their undivided trust in you deserve the best protection possible.

Being proactive rather than reactive in protecting your practice and patient data can save you more than just the thousands of dollars in recovery costs and fines. Doing so will also save you unneeded stress, headache and—maybe most importantly—your reputation.

Having premier IT support should not be looked at as an expense, but rather as an investment and even as insurance to an extent. Find an IT partner who sees itself as an extension of your practice, not just a vendor who sees you as just another number on its bottom line.

When it comes to finding the IT vendor that is the best fit for your practice, always keep in mind these words, spoken by the brilliant Benjamin Franklin, “An ounce of prevention is worth a pound of cure.”

Editorial note: This article originally appeared in Shift Magazine (autumn 2019), and an edited version is provided here with permission from Sprig Oral Health Technologies.

about



Tom Terronez is a hands-on leader in the dental technology industry and is committed to helping practices reach their efficiency and IT security potential. Since founding tech companies Medix Dental IT and Terrostar Interactive Media in the early 2000s, he has become a nationally respected and increasingly sought-after expert in his field.

His mission to help practices mitigate risk, protect patients and maximise overall success has enabled dentists all over the US to embrace a new type of technology partner.

Smart means **integrated digital technology** for improved dentistry

An interview with Dr Ginal Bilimoria, a general dentist from Orewa in New Zealand, honoured with the first Smart Integration Award

By Dentsply Sirona

In 2019, Dr Ginal Bilimoria was honoured with Dentsply Sirona's first Smart Integration Award which celebrates innovative ideas from female dental experts. It was awarded to her for her forward-looking ideas related to the digital workflow and the impact that integration would have on both her as a practitioner and on her patients. Bilimoria is a general dentist in Orewa, a suburb of Auckland in New Zealand. Dentsply Sirona spoke with her about what made her decide to enter the competition, the role of technology in her own practice and her future goals.

Dr Bilimoria, you were awarded the 2019 Smart Integration Award by Dentsply Sirona. What made you decide to participate?

There were four different aspects that intrigued me about the award application. Firstly, it was about efficient, intelligent and integrated workflows using smart networked processes—something I am interested in. Secondly, the criteria specified that our current experience of digital workflows could be submitted in the application along with our ideas for the future. It was exciting that the winning ideas could be used as prototypes for future equipment. Thirdly, it was open to women from all over the world, and when women get together in a group to discuss dentistry, the dynamic is often quite different, as we open up and share more easily about our struggles and successes. And finally, I thought to myself what a forward-thinking company this is, that

actually invites feedback in a formal, yet unique and approachable way from its customers. This is a company that is passionate about the future of dentistry and with which I would like to align myself. When I met the management team in Germany, every person in the team reflected this same passion for innovative dentistry.

Do you have a dental specialisation?

In New Zealand, to become a registered dental specialist one must have completed an additional full-time three-year doctorate degree from the University of Otago in Dunedin. Although I was accepted for specialisation in prosthodontics, the programme was only available full-time, and increased family commitments, combined with trends indicating that the near future would be good for proficient general dentists, steered me away from that path.

I did, however, pursue postgraduate studies overseas in general dentistry. I became a graduate of the Kois Center for advanced dental education in Seattle in the US. Dr John Kois, the founder, himself a periodontist and prosthodontist, has been delivering his advanced dental curriculum for over 30 years. Its content is constantly being updated with every new piece of validated scientific evidence that he reviews personally.

You have recently opened your own dental practice. Can you tell us more about it?

I am extremely excited about my own private practice which was launched in December 2020 and is called SmartDentist. The name was actually inspired by the Smart Integration Award I received. In this context, "smart" means integrating digital technology for the purpose of wellness and improved dentistry for my patients. I want to create an ambience that is conducive to healing and a positive experience for both the patient and the provider because I believe in the "flow" concept: "When the mind is still on both sides of the chair, then the healing can begin—with my hands on one side and your smile on the other."

Since 2019, Dentsply Sirona has been honouring innovative women in digital dentistry with the Smart Integration Award.



My boutique one-surgery practice idea was born purely out of my passion to provide better outcomes for my patients utilising the right tools. Dental companies like Dentsply Sirona have also inspired me with their state-of-the-art digital technology tools which help deliver such outcomes.

My theme for the practice is based around the concept of wellness dentistry for better oral health, using smart digital technology with a focus on patient education. The key focus areas are developed to include treatments such as CEREC same-visit crowns, clear aligner therapy, SMART (Safe Mercury Amalgam Removal Technique) protocol and smile design, using all the principles I learned at the Kois Center.

For my practice, I have purchased the CEREC Primescan, the CEREC Primemill and the CEREC SpeedFire. I am excited about the new Primescan because it enables more accurate and faster full-arch scans for diagnostics and digital impressions for Kois Deprogrammer construction and other removable appliances. I am able to track wear of teeth over consecutive years and give it a metric judgement rather than a visual observation based on vague memory recall. I also have the ability to scan the deeper subgingival margins for CEREC crowns which was more difficult with the predecessor Omnicam. I am looking forward to using SiroLaser Blue for smooth no-touch cutting efficiency for gingivectomies and for exposing crown margins. The feature I like most about the Primemill is how it reduces the time taken to grind e.max crowns and the milling of zirconia crowns to under 5 minutes! And it has a whole new bur system. The brand new 0.5mm bur tool for achieving detailed fissure anatomy on the occlusal surface of crowns also helps the crowns look more like a natural tooth. It is impressive to see how CEREC technology has evolved in the past 30 years.

Does digitalisation play a major role in dentistry in New Zealand? And how important is the topic of digitalisation in dentistry for you, personally, and in your practice?

With the current exchange rates, I feel the level of financial investment required to enter the digital space and the steep learning curve hinder many of us. For this reason alone, the uptake may not be as high in New Zealand as compared with other parts of the world. When it comes to CEREC awareness, though, about 90% of New Zealand dentists know about it and would probably plan to have it at some stage of their careers as the technology keeps improving. Actually, many dental practices and especially laboratories in New Zealand are currently investing in intra-oral scanners.

How did your work and dentistry change with COVID-19 in relation to patient care and the role of digitalisation in dentistry? Does digitalisation now play an even greater role?

Yes, digitalisation does play an even greater role now than ever before. The pandemic has definitely brought about an urgency for reducing the physical touch points at my practice. Using cloud-based dental software means no more

paper is required for medical and dental history forms because it can be done through a secure portal online. Sidexis 4 enables us to discuss the radiographs, photographs, treatment plan, estimates and invoices on the chair monitor with the patient at the treatment centre. We no longer have the need to print estimates or invoices but can e-mail them when requested. Having the foot control toggle to change settings on the Sinuis treatment centre helps for a hands-free approach. Digitalised auto purging of the treatment centre also ensures a systematic robotic process to help eliminate any human error for chair cross-infection protocols. Primescan, Primemill and SpeedFire ensure we can remain independent of national and worldwide courier delay issues, and they also reduce touch points. In addition, our IQAir filtration units and ducted ventilation system give us peace of mind that we are doing everything we possibly can to keep our patients and ourselves safe in the unpredictable times of COVID-19.

What are your special interests and focus topics in dentistry?

My special interest is on patient education, and one of my focus topics in dentistry is the breaking down of barriers so that our patients feel more engaged, involved and excited about their dental visit and treatment. I have found that patients who are educated about their oral health value and appreciate the treatment we have to offer. I am keen to research what patients are really trying to say when they explain their dental symptoms and perceived needs. It is important to educate our patients that dentistry is customised and health based and not an itemised commodity. Patients need to become advocates for their own dental health so they can make better decisions about it in order to improve their dental outcome and experience.

Do you have any special professional or personal goals?

Dentistry is my main hobby. My goal is to realise my passionate vision in the context of my start-up practice. I want to create a practice with a wellness atmosphere for myself as the provider and for my patients. Being close to home and my children is important to me. To be able to afford cutting-edge technology will require a phased approach and support from patients that share the same values for their smile goals.

Editorial note: The winners of this year's award will be announced during a virtual award ceremony on 12 November 2021.



Dr Ginal Billimoria (Image: © Dentsply Sirona)

“Digital dentistry will set you apart”

An interview with Dr Christopher Ho, specialist prosthodontist from Australia

By Brendan Day, Dental Tribune International

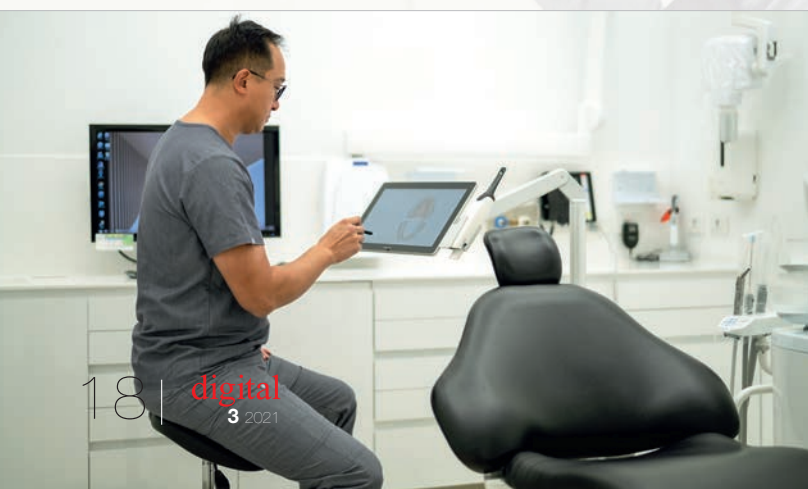


Dr Christopher Ho has been using 3Shape's range of digital solutions in his dental practice since 2014. (All images: © Canaan Tsai)

As the principal at the Sydney-based dental practice Care Dentistry, specialist prosthodontist Dr Christopher Ho leads by example. The procedures and techniques he employs to create aesthetic rehabilitations are guided by digital solutions that deliver greater efficiency, accuracy and patient acceptance. Here, he discusses how 3Shape's product portfolio powers his digital workflows.

Dr Ho, could you please tell us about how you became a practitioner of digital dentistry?

I've been in practice for more than two decades, and when I started, dentistry was definitely more analogue-based. Impressions, for example, were made using substances like alginate and silicone—materials that are still used by dental practices, but which can cause patient discomfort and distress. The digital journey started with the introduction of digital cameras, radiographic imaging and



CAD/CAM dentistry, which changed the landscape of dentistry. The introduction of intra-oral scanning, or what many call “digital impressions”, really was a complete change in my approach to prosthodontics and has been one of the best technologies introduced in my practice.

When were you first introduced to 3Shape's portfolio of dental solutions?

My journey with 3Shape started with intra-oral scanning with TRIOS around 2014. TRIOS was relatively new at the time, particularly in Australia, and the technology was very exciting. To be able to take impressions digitally rather than physically with such ease and accuracy was amazing. I've continued to be a proponent of digital dentistry as it has advanced in the years since, and it is absolutely pivotal to the work we do here at Care Dentistry.

What is the learning curve like for 3Shape's digital solutions?

One of the great things about 3Shape products is their user interface. These interfaces are almost always designed to be as intuitive and clean as possible, and as dentists very often have limited time, the ability to jump in and start using a piece of digital software with very little training is a clear advantage.

What benefits does digital technology bring for patients?

As a dentist, I can easily visualise the final result of a course of treatment. From a patient's point of view, this is, understandably, often not possible. When applications like 3Shape Smile Design are used, a patient is able to see a simulated demonstration of what his or her teeth will look like after treatment. This can help patients decide whether or not they want to proceed with treatment. It also provides an emotional connection for patients, particularly if they are undergoing aesthetic dental procedures, making it easier for them to give informed consent as they can visualise the intended changes.

Have patient expectations changed regarding digital dentistry? Are they more aware of what tools and technologies are available?

In this digital age, there is certainly a growing awareness among patients that dentists are now able to show them what their teeth will look like after the course of treatment.

Digital dentistry is “absolutely pivotal” to the work conducted at Care Dentistry.

From a dentist's perspective, digital dentistry will set you apart from others—the ability to simulate images and show patients how treatment can benefit them can, ultimately, lead to a greater sense of trust.

Digital impressions provide a much better experience for our patients, and no longer do they have to suffer the use of physical impression materials which can be uncomfortable and cause gagging. Along with the improvement in efficiency and ease of use, the majority of dentists that embark on a digital workflow enjoy the advantages of intra-oral scanners.

What is the attitude of other dental professionals at your practice when it comes to integrating digital dentistry? Are there any generational differences?

I think it's fair to say that the younger dentists in my practice are generally extremely tech-savvy and adopt digital technologies very readily. For the older dentists, it did sometimes take them a little bit of time to familiarise themselves with tools such as intra-oral scanning, but once they were comfortable with them, it created a major transformation in what they could offer patients, and they haven't looked back since.

What role does digital technology play in your practice's everyday workflows?

We take pride in being a state-of-the-art practice and in delivering the best treatment that we possibly can for our patients. Part of what we offer, then, lies in having the best products and the most technologically advanced equipment, and this is where 3Shape really offers us benefits.

A large part of digital dentistry for me involves using 3Shape's workflows. This means using 3Shape TRIOS MOVE, for example, to conduct intra-oral scans of the patients, which can then be placed in a virtual articulator to simulate jaw movements. I can then communicate with our in-house dental laboratory by using these 3Shape scans to plan cases more accurately and, ultimately, successfully. When everyone can see the same digital scans, it allows for better communication and planning.



Dr Ho's practice offers state-of-the-art digital dentistry services.

Which other 3Shape products does your practice use and for what purposes?

As I mentioned, I use the 3Shape TRIOS MOVE but I also employ the TRIOS Patient Specific Motion tool to better understand how my patients function with their teeth. Just recently, I had a patient referred with significant temporomandibular jaw problems after recent restorations. To investigate the underlying problem, I manually checked occlusion but was unable to see exactly what the issue was. With the TRIOS Patient Specific Motion tool, I could actually see quite clearly where the interferences in the bite were, and thanks to the increased accuracy of this technology, I was able to alleviate the problem by careful removal of the iatrogenic interferences.

The Smile Design app is another handy tool from 3Shape that I use quite frequently. It allows me to show patients what their smiles will look like after treatment, and it's so quick and easy to use that, when I demonstrate it in front of a patient, he or she can instantly grasp how to use it and can then play around with it and compare the before and after mock-ups.

TRIOS Patient Monitoring has been another useful tool with the ability to show patients the difference between scans taken over a period of time. We can demonstrate tooth wear, gingival recession and even the effect of augmentation with soft- or hard-tissue grafts.

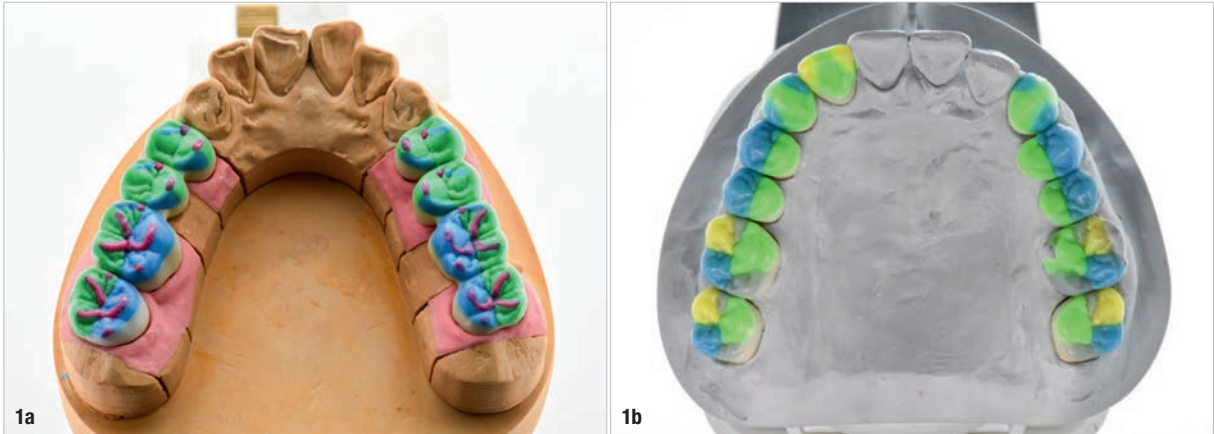
“A large part of digital dentistry for me involves using 3Shape's workflows.”



One step closer to nature

Occlusal concepts and sophisticated aesthetics in digital dentistry

Atsushi Hasegawa, Japan



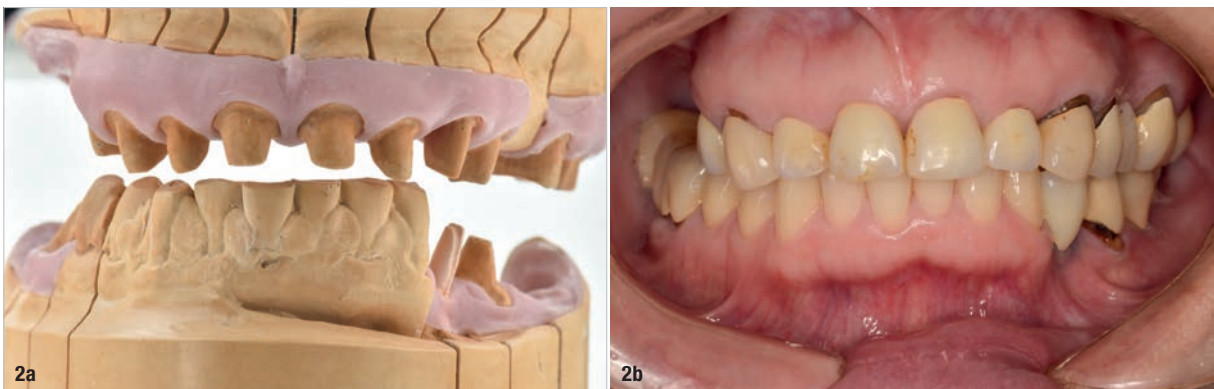
Figs. 1a & b: Natural waxing-up technique **(a)** by dental technician Dieter Schulz and sequential functional occlusion **(b)** by Prof. Rudolf Slavicek.

A dental restoration is not just an aesthetic restoration; it must fulfil many more requirements and integrate perfectly into the existing system. In this article, I discuss function and the way to a highly aesthetic, functional and very natural tooth restoration.

My philosophy

The goal of dental technicians is to produce restorations which are harmonised in terms of the natural teeth and mandibular movement. Restorations should be incorporated into the body without inhibiting existing functions and satisfy the functions of mastication and pronunciation. To achieve the purpose of restoration,

it is necessary to deeply analyse and understand the temporomandibular joint with mandibular movement and skeletal form and the anatomical shape of each tooth. There is a functional correlation between mandibular movement and the anatomical shape of the individual tooth. This interaction is an important basic concept for the reconstruction of the masticatory organs. By the dental technician understanding and implementing such a concept, the anterior and the posterior teeth maintain their harmony in the static and dynamic positions. The posterior protects the anterior teeth from the vertical pressure and the anterior protects the posterior teeth from the lateral pressure. Occlusion being highly diverse, it is one of our roles as dental technicians



Figs. 2a & b: Initial situation with severe peri-implantitis.



CADIAX® Curves

	Protrusion		Mediotruson right		Mediotruson left	
	SCI right	SCI left	S C I	T C I	S C I	T C I
1st	44.3°	48.1°	31.9°	30.1°	-41.1°	-0.7°
2nd	48.5°	53.3°	42.5°	23.0°	47.6°	31.9°
3rd	50.9°	53.5°	43.8°	23.6°	53.2°	36.1°
4th	49.6°	54.7°	44.4°	23.1°	55.2°	31.8°
5th	48.5°	55.7°	45.2°	21.1°	53.9°	27.9°
6th	47.6°	54.8°	44.7°	18.6°	52.8°	24.3°
8th	44.0°		42.2°	15.6°	48.4°	20.2°
10th			39.1°	13.2°		
14th						
Retrusion						
-1.	70.4°r	49.4°r				
-2.	60.4°r					

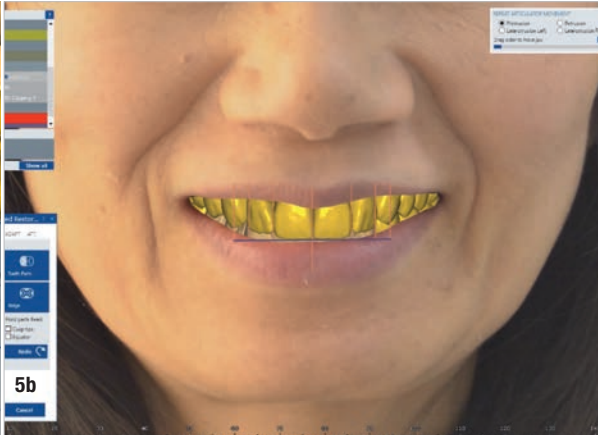
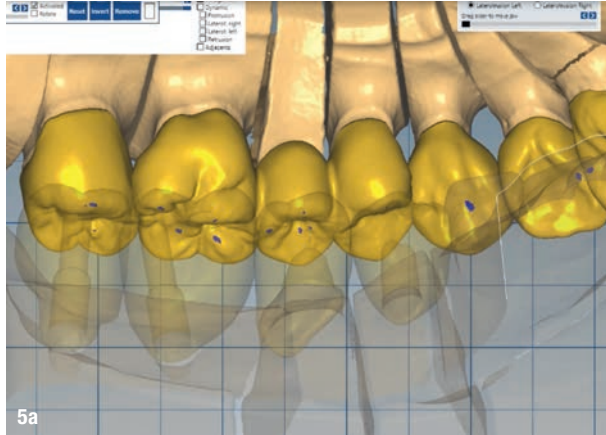
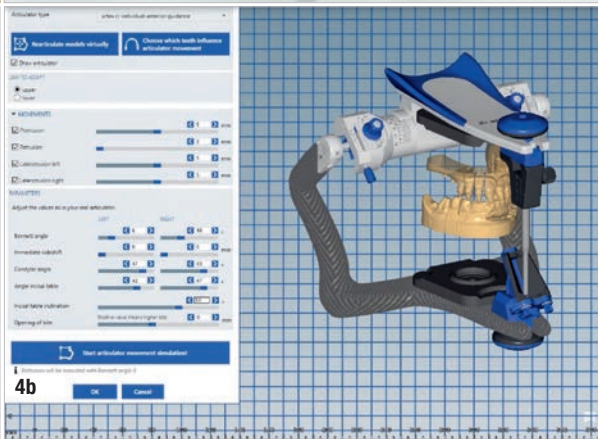
Sagittal Condylar Guidance Artex® CR

	Right			Left		
	3rd mm	5th mm	10th mm	3rd mm	5th mm	10th mm
Angle	41°	43°	45°	43°	47°	

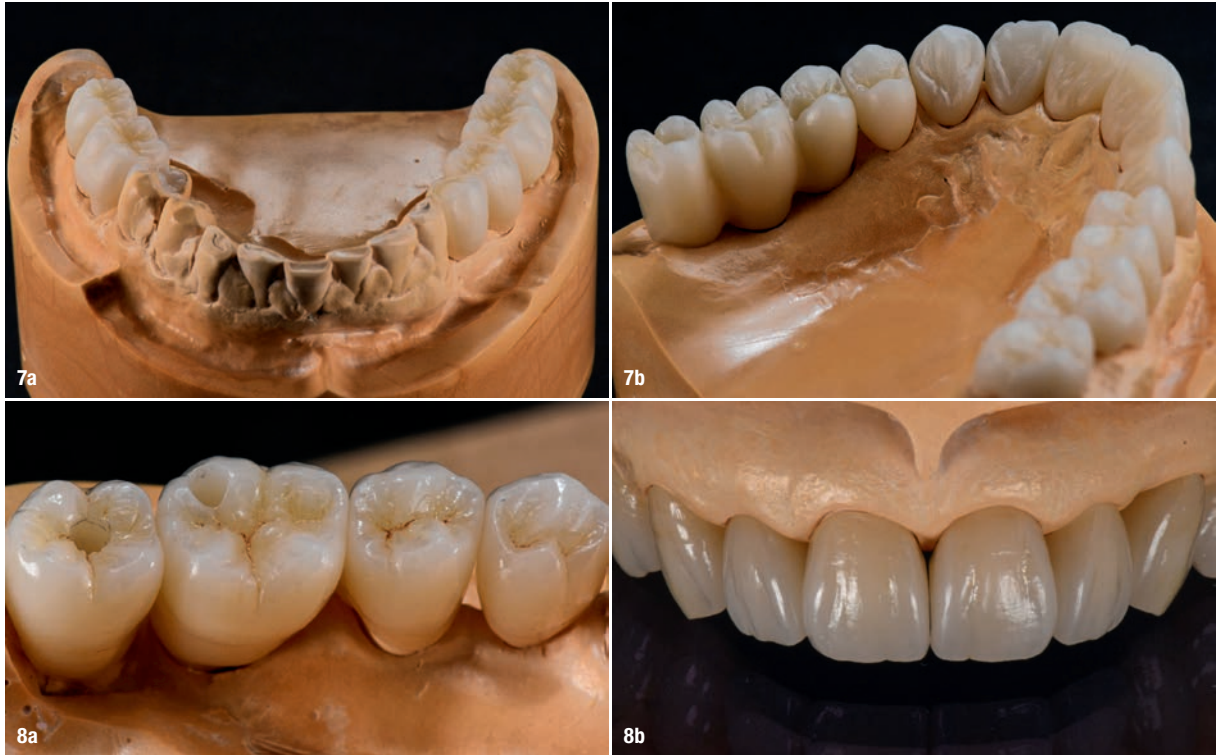
Transversal Condylar Guidance Artex® CR

	Right			Left		
	3rd mm	5th mm	10th mm	3rd mm	5th mm	10th mm
Angle	21°	19°	15°	13°	22°	19°
ISS	0.0	0.0	0.0	0.0	0.0	0.0

ISS Threshold: 0.5



Figs. 3a & b: Extensive patient data was obtained using the facebow and transfer to the Artex CR. **Figs. 4a & b:** The virtual articulator is filled with CADIAX data. **Figs. 5a & b:** 2D and 3D images, combined with the design, are the perfect base for recreating the patient situation. **Figs. 6a & b:** Beautiful surface results after manual surface treatment.



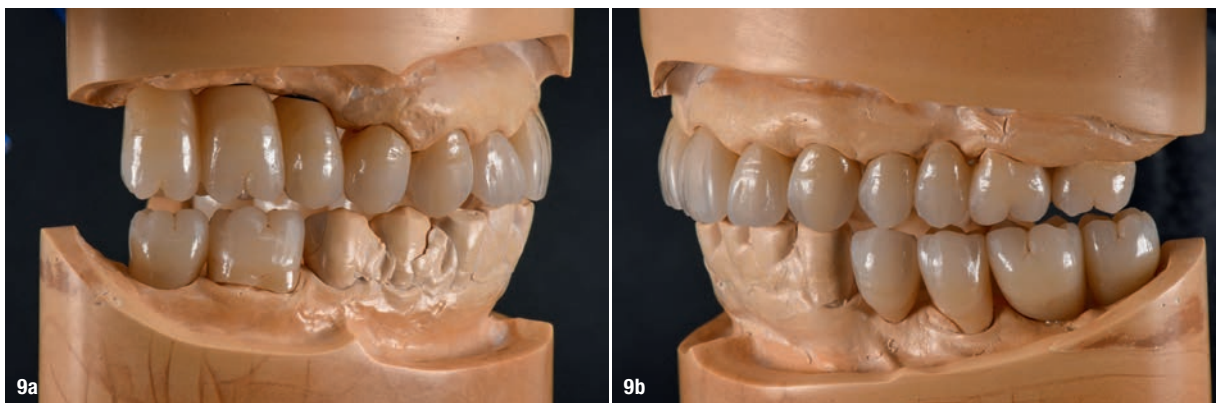
Figs. 7a & b: The surface structure can still be seen after sintering. **Figs. 8a & b:** For a natural shine, I set the accents with staining and glazing.

to understand this complex mechanism of movement and the pathway of the temporomandibular joint (mandibular movement) and dentition (occlusal compass) and reflect it in the daily work of the production of prostheses.

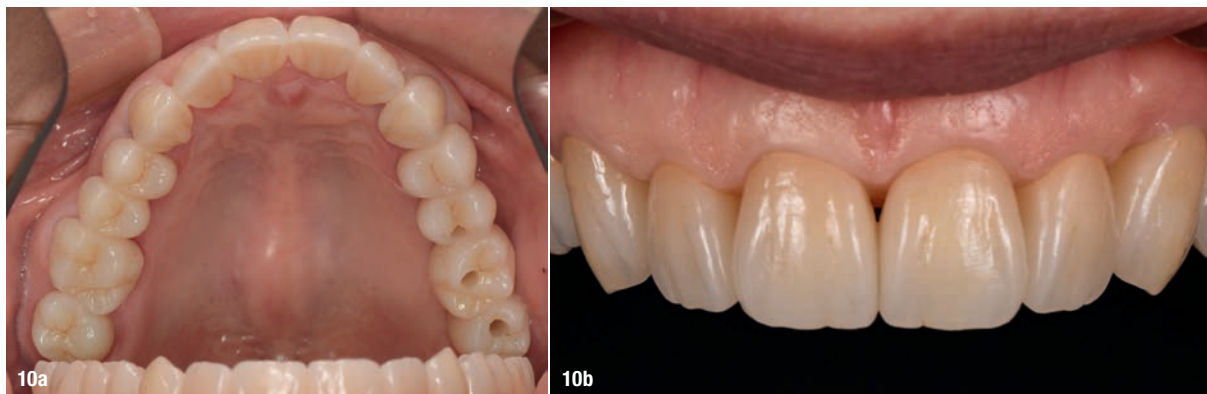
My specialty is the design of the occlusion, though I see myself as an all-rounder dental technician because all dental restorations, such as implants or partial dentures or even a small inlay, contain occlusal surfaces. I have studied occlusal philosophies such as the natural waxing-up technique by dental technician Dieter Schulz and sequential functional occlusion by Prof. Rudolf Slavicek (Figs. 1a & b). These philosophies and techniques are the basis of my daily work in our laboratory.

Uniting the functional and aesthetic considerations

A 50-year-old female patient with severe peri-implantitis came to our laboratory with the desire for a functional and aesthetic restoration (Figs. 2a & b). Our treatment plan was to address the severe peri-implantitis, to place new implants and, ultimately, to improve the overall aesthetics. For the implementation of the treatment plan, our first step was complete occlusal reconstruction with Zolid FX Multilayer (Amann Girrbach), except for the mandibular anterior teeth. It is important to collect as much patient information as possible for such an extensive occlusal reconstruction. Therefore, we used the CADIAX system (GAMMA Medizinisch-wissenschaftliche Fortbildungs-GmbH) to obtain the jaw movement data. The facebow transfer



Figs. 9a & b: The perfect occlusal surfaces and canine guidance control during jaw movement.



Figs. 10a & b: Highly aesthetic and functional result.

data, in combination with the Artex CR (Amann Girrbach) and the CADIAX data, is necessary to reproduce the jaw movements with the virtual articulator (Figs. 3a & b).

During the design, I concentrate on a few key points, which I finally check with the virtual articulator. The most important points are the occlusal supporting surfaces, such as the posterior tooth areas, which are important for support during intercuspation and stabilisation of the vertical dimension. They protect the joints from compression and the anterior teeth from overloading.

Based on this information, I consider the natural waxing-up technique and sequential functional occlusion to be particularly suitable. With the virtual articulator, I control all the jaw movements in all directions (Fig. 4). The canines are important because they protect the posterior teeth from overloading. The guiding angle of the canine should be coordinated with the craniomandibular system and should not affect the posterior teeth. The anterior teeth are important for speech, for function with the lips and, of course, for aesthetics—a natural smile. To recreate the original patient situation, I use 2D and 3D images for excellent orientation (Figs. 5a & b).

With the Ceramill Motion 2 (Amann Girrbach), I obtain satisfactory milling results, but if I want to achieve more surface structure with higher aesthetic results, I treat the surfaces manually. I select my tools carefully because it is essential to avoid of the chipping, cracking and contamination of the zirconia during this procedure (Figs. 6a & b). The manual surface treatment produces beautiful small details and morphologies for a natural appearance. These include perikymata and transverse ridges, which are needed for anterior teeth morphologies.

After sintering, I obtain the perfect basis for the finish (Figs. 7a & b). The occlusal contacts are polished by hand before glazing. For a natural shine, I finally set the last accents with staining and glazing. From my point of view, the greatest advantage of Zolid FX Multilayer is that I can produce the digitally designed form precisely. Especially

in these complex cases, I want as little post-processing as possible (Figs. 8a & b).

Finally, I would like to have canine guidance with no disturbing contacts in laterotrusion and protrusion. These movements are reproduced correctly in the same way as I designed them in virtual Artex CR (Figs. 9a & b). The coordinated workflow from the manual articulator to the virtual articulator is simply ingenious and facilitates my daily work. This only works successfully if the manufacturer coordinates both the articulator and the CAD/CAM system, which has been done successfully for these products.

Function is a major part of my daily laboratory life, and I am very thankful that the virtual implementation of function in combination with efficient materials makes my work much easier. From my point of view, zirconia, especially Zolid FX Multilayer, is ideal, as it combines high aesthetics with strength (Figs. 10a & b). Zirconia also has disadvantages; for example, if the crown is incorrectly stressed, this can lead to periodontitis or problems with preparation or the condyles. Therefore, our job as dental technicians requires that we consider occlusion and function.

I would like to thank my clients who provide me with exciting work every day.

about



Atsushi Hasegawa gained his licence to practise as a dental technician in 1996 and completed postgraduate studies at Kanagawa Dental University in Yokosuka in Japan in 1998. He then worked for 11 years in a dental laboratory in Tokyo in Japan, where he acquired specific knowledge and skills in the field of occlusal concepts.

In 2008, he opened his own laboratory, Organ Dental Lab, in Chigasaki in Japan. Today, Hasegawa transfers his knowledge through lectures in Japan and worldwide. He can be reached through his website, www.organdental.jp.



Tenet: Time inversion applied to dentistry

Dr Yassine Harichane, France

Introduction

Time travel—two words that sound odd in an article on dentistry, but are a daily reality for all health professionals. Ageing concerns all patients who see their bodies

deteriorate and aspire to go back in time to regain their lost youth. This is even more true in dentistry where dentists are often called upon to treat patients suffering from pathologies that are destructive over time such as decay, tooth wear and periodontal disease. Patients



Fig. 1: Final situation. Fig. 2: Close-up of the final situation.

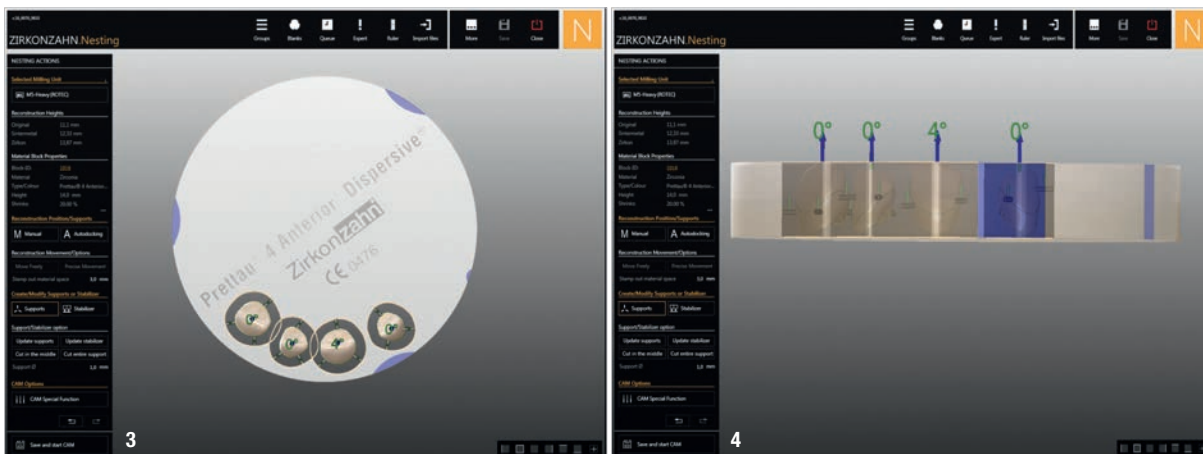


Fig. 3: Nesting of the zirconia crowns, upper view. **Fig. 4:** Nesting of the zirconia crowns, lateral view. **Fig. 5:** Milling bur path in the zirconia disc. **Fig. 6:** Digital wax-up of the crowns. **Fig. 7:** Digital models of the maxillary and mandibular arches.

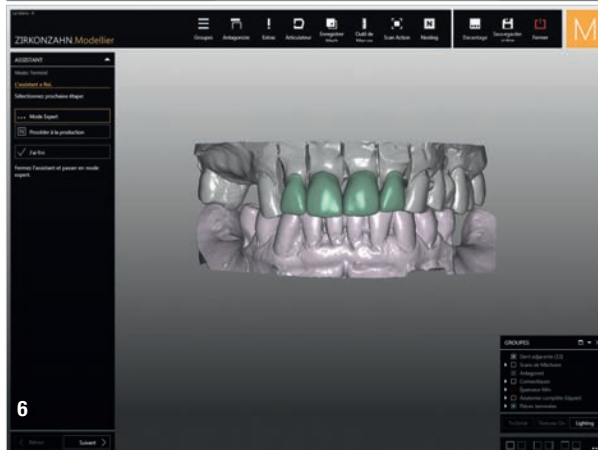
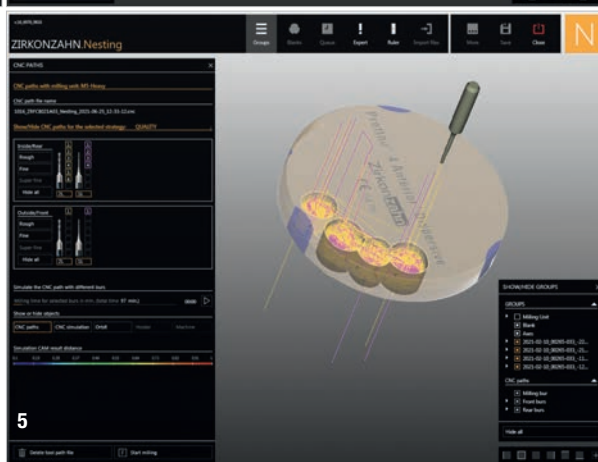
most often wish to regain their original smiles, which have been gradually altered by time and life events. The healthcare professional must then demonstrate technical and medical ingenuity to restore the initial situation by restoring the original shape, colour and position of the oral structures.

In this article, we will inverse time to describe a clinical case backwards and show that therapeutic success is achieved when the end result becomes a new beginning for the patient.

Case report

Figure 1 shows a clinical situation in which the patient will be able to smile literally and figuratively. The teeth have a harmonious shape, position and shade, despite minor defects such as cervical lesions of the mandibular incisors. There is also good periodontal health, there being no plaque or gingivitis. What the reader is far from suspecting is that this final situation corresponds to the placement of four crowns on teeth #12–22.

Figure 2 shows us close up the quality of the restorations and the care taken by the dental technician in the production of these crowns. Indeed, the anatomy is



“Patients most often wish to regain their original smiles, which have been gradually altered by time and life events.”

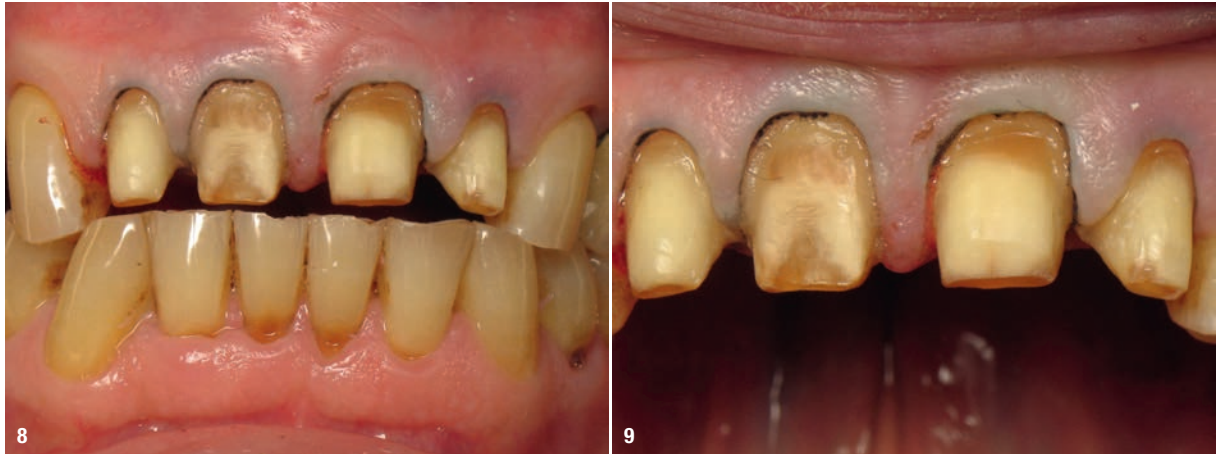


Fig. 8: Tooth preparation and retraction cord placement. **Fig. 9:** Close-up of the tooth preparation and retraction cord placement.

harmonious and leaves no black triangles at the gingival papillae. In addition, the shade is natural, saturation increasing gradually from the incisal edge to the cervical region. The laboratory technician added a subtle touch of ochre stain in vertical lines. Particular attention has been paid to this clinical case for a result that exceeded the patient's expectations.

Captured three days earlier, Figures 3–5 show the nesting, using ZirKonzahn.Nesting software (ZirKonzahn), of a polychromatic zirconia disc (Prettau 4 Anterior Dispersive, ZirKonzahn). This material was used for these crowns in order to provide substantial longevity thanks to its resistance to bending and to provide obvious good aesthetics with its high translucency.

The choice of this material was fundamental in this indication, anterior restorations, when an alternative to lithium disilicate was sought. The reader will have to wait to go back in time to understand this alternative.

Captured four days earlier, Figure 6 shows the digital wax-up performed in ZirKonzahn.Modellier software (ZirKonzahn). For the dental technician, the main difficulty was rethinking the anatomy of the maxillary incisors while restoring the initial shape of the teeth. The overall shape of the other teeth gives an overview of the geometric typology of the teeth: round, square, triangular. All forms are possible, but only one form is suitable for this clinical case. CAD/CAM software allows automatic guidance in obtaining a harmonious shape. Then the laboratory technician will take control and proceed individually to bring human touches to a computer system.

Captured five days earlier, Figure 7 shows the virtual model after the digital scan step (ZirKonzahn.Scan, ZirKonzahn). The software makes it possible to digitise physical models to import them into the software suite. The digital models are then mounted in occlusion on a virtual articulator. The preparation boundaries are drawn, and thanks to prior trimming, each prepared tooth can be individualised to move on to the next crown modelling step.

Taken a week earlier, Figures 8 and 9 show the dental preparation and the placement of the first gingival retraction cord. The form of preparation left sufficient margin for the technician to design the crowns. The gingival retraction cord was placed during the preparation phase to avoid injury of the cervical gingiva and to move it apically. It was thus possible to achieve juxta-gingival limits respecting the dental anatomy and periodontal health. It is interesting to note that the tooth shade is not homogeneous between the teeth and within the



Fig. 10: Pre-op tooth shade.



Fig. 11: Initial situation. **Fig. 12:** Close-up of the initial situation.

tooth itself. We will go back in time to understand this phenomenon.

Taken 1 hour earlier, Figure 10 shows a real patchwork of tooth shades. There was translucency of the incisal edge, cervical saturation, cracks, missing restorations and a complex coronary fracture of tooth #11. All these elements caused the teeth to react by building reactionary dentine over time, and that was the source of the several shade differences.

Captured at the same time as Figure 10, Figures 11 and 12 show the initial situation of this patient, who came for a consultation to rehabilitate his maxillary incisors. The diagnosis revealed nocturnal bruxism as the origin of several areas of crown destruction: wear of the incisal edge, abfraction, missing restorations, cracks and a complex coronary fracture. It is easy to understand why the choice of material was zirconia. It is also easy to understand the motivations of this patient to recover his lost smile. This degradation over time is inevitable, but in this patient, it was particularly fast and aggressive. Reversing the course of time was therefore obvious in restoring the dental health of this patient.

Conclusion

One does not have to own a time machine or a time turnstile like in the blockbuster movie *Tenet* to reverse the effects of time. Dentists have access to technology sophisticated enough to correct the deleterious effects of time and allow patients to regain their former smiles.

Far from science fiction, modern dentistry has initiated a digital transition in which new tools and new techniques are emerging. All our patients dream of regaining the smile of their 20s: healthy and beautiful teeth. With current digital tools, it is now possible to restore what

“...modern dentistry has initiated a digital transition in which new tools and new techniques are emerging.”

was destroyed in the past and give a new future to the smiles of our patients. Digital dentistry therefore move with the times and does not create any damage, which could be summed up with this palindrome sentence: “Live on time; emit no evil”.

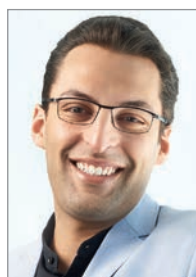
Disclosure

The author did not report any disclosures.

Acknowledgement

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about



Dr Yassine Harichane graduated from the former Paris Descartes University in France and conducted a number of research projects there. He is the author of numerous publications and a member of the cosmetic dentistry study group at the University of Paris. He can be contacted at yassine.harichane@gmail.com.

Immediate loading of post-extraction implant in an area of high-aesthetic value

Digital workflow advantages

Dr Vincenzo Santomauro, Italy



The use of the latest digital workflows in both surgery and prosthetics is introducing significant innovations, especially concerning ways of making clinical procedures easier and faster. Nowadays, using the Virtuo Vivo intra-oral scanner (Straumann) and coDiagnostiX software (Dental Wings), it is possible to create a digital workflow which facilitates immediate loading of a temporary

prosthesis, starting with the CBCT examination and followed by surgical and prosthetic digital planning. This is also possible thanks to the CARES Visual CAD software (Straumann), which works in harmony with coDiagnostiX. The aim of this article is to highlight how, by implementing a clinical and prosthetic digital workflow, it is possible to quickly simplify these procedures and guarantee highly precise and predictable results.

Case report

A systemically healthy 50-year-old man presented at our practice requesting the restoration of a missing crown of a central incisor. His main priority was aesthetic appearance, and his expectations were high.

Initial situation

The extra-oral and intra-oral examination revealed a medium to high smile line, a medium-thickness gingival biotype, good general oral hygiene and multiple gingival recessions. Furthermore, he presented with a horizontal fracture below the cemento-enamel junction on tooth #11 with the exposure of the root canal and plaque accumulation in the area (Fig. 1). The periapical radiograph and CBCT examination showed findings compatible with interproximal bone loss and partial root canal therapy (Fig. 2).

Assessment of Surgical Cases: Single-tooth gap

Defining Characteristics: One missing tooth to be replaced by one implant.

Placement protocol: Immediate implant placement

Socket integrity: Damage to one or more bone walls

Tooth site: Maxillary incisor or canine

Socket morphology: Single-root socket

Anatomic Risk	Esthetic Risk	Complexity	Risk of Complications
Low	High	Moderate	High

Additional procedures that may be required:

- Simultaneous bone augmentation
- Adjunctive soft tissue graft

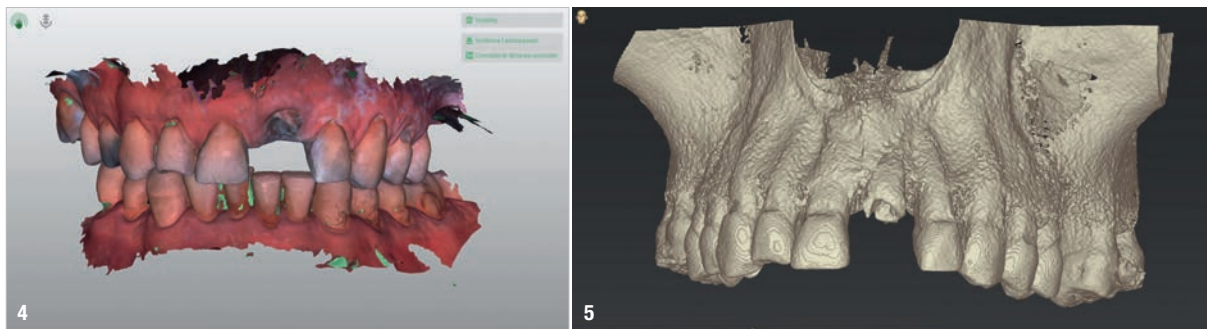
Additional risks: None

Normative SAC Classification: **Complex**

Modifiers:

- Up Line
- Exposure of papillae
- Gingival Biotype
- Medium scalloped, medium-thick
- Shape of Tooth Crowns
- Rectangular
- Infection at Implant Site
- None
- Bone Level at Adjacent Teeth
- ≤ 5 mm to contact point
- Restorative Status of Neighboring Teeth
- Virgin
- Width of Edentulous Span
- 1 tooth (≥ 7 mm)
- Soft Tissue Anatomy
- Defective
- Loading Protocol
- Immediate

Additional complexity/risk based on modifiers: None, Moderate, High



Taking into consideration the patient's expectations and the clinical and radiographic findings, the placement of a post-extraction dental implant was planned.

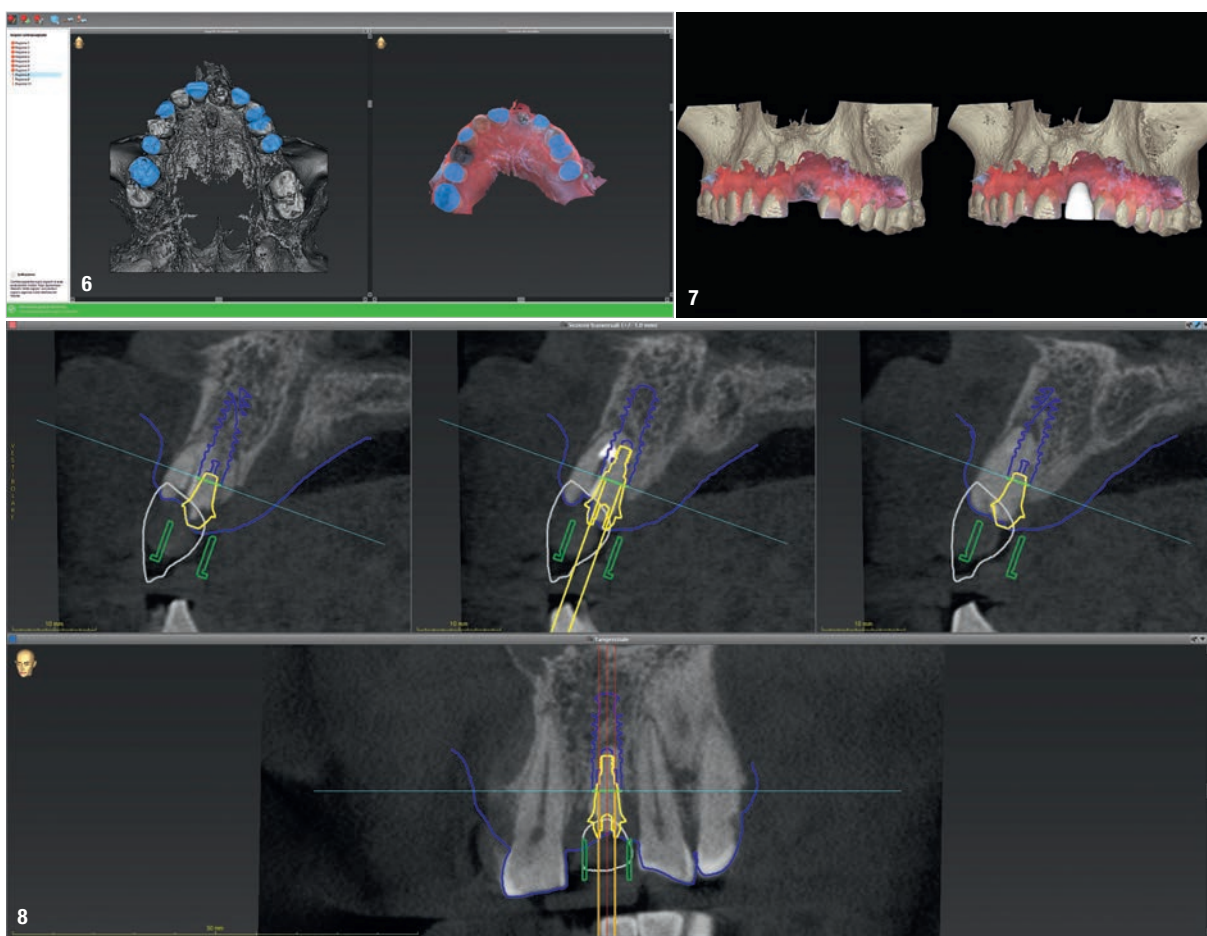
Treatment planning

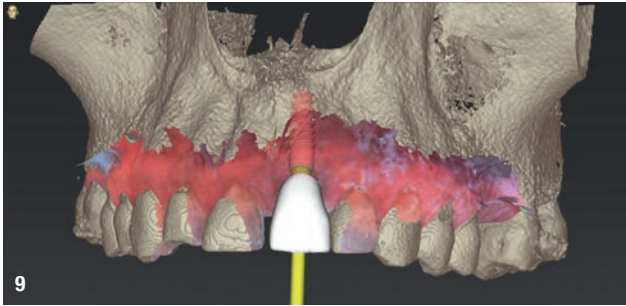
The SAC Assessment Tool was used to assess the complexity and potential risk associated with this case. Since the protocol to be used would include immediate loading and other modifiers, this case was defined as advanced and complex (Fig. 3).

The treatment plan included the insertion of one Straumann BLX Roxolid SLActive post-extraction implant

(diameter: 3.75 mm; length: 12.00 mm) using computer-guided flapless surgery and a screwed, immediately loaded temporary crown in order to minimise the patient's aesthetic discomfort and enable immediate soft-tissue conditioning.

An intra-oral impression of the initial clinical situation was taken using the Virtuo Vivo scanner (Fig. 4). The CBCT DICOM files were imported into the coDiagnostiX planning software and were created through segmentation to eliminate CBCT data artefacts and obtain a 3D conversion of the bone tissue (Fig. 5). The PLY file obtained from the initial scan with the scanner imported the information concerning soft tissue and dental surfaces. Moreover, another STL file was created during the prosthetic planning.





Afterwards, both files were matched by the alignment or superimposition of the two 3D objects (between a 3D reconstruction of DICOM data cleaned of metallic artifacts and one STL file, or between two STL files) with some regions of interest in common. When the areas to be matched on both files are selected, the software automatically determines the matching (Fig. 6). As a result, we obtain images of bones, teeth, soft tissue and wax that can be perfectly superimposed on one another (Fig. 7).

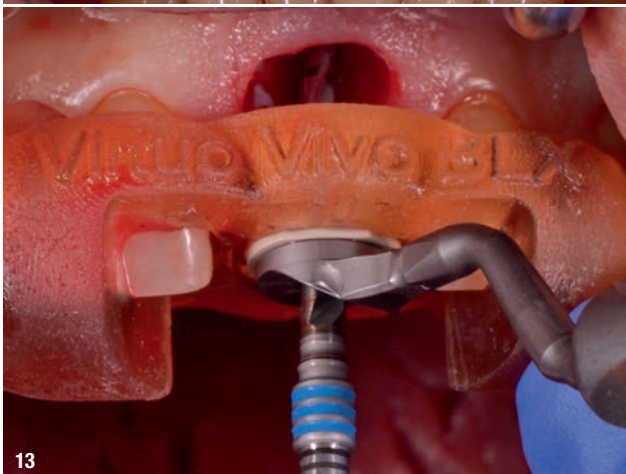
The ideal implant position can be planned digitally in line with the prosthetic solution that is most suitable for the surgical plan, including predicting the related selection of the most appropriate abutments (Fig. 8). Following a prosthetically driven planning strategy and taking into consideration the bone volume, we planned to insert a Straumann BLX Roxolid SLActive implant (Fig. 9).

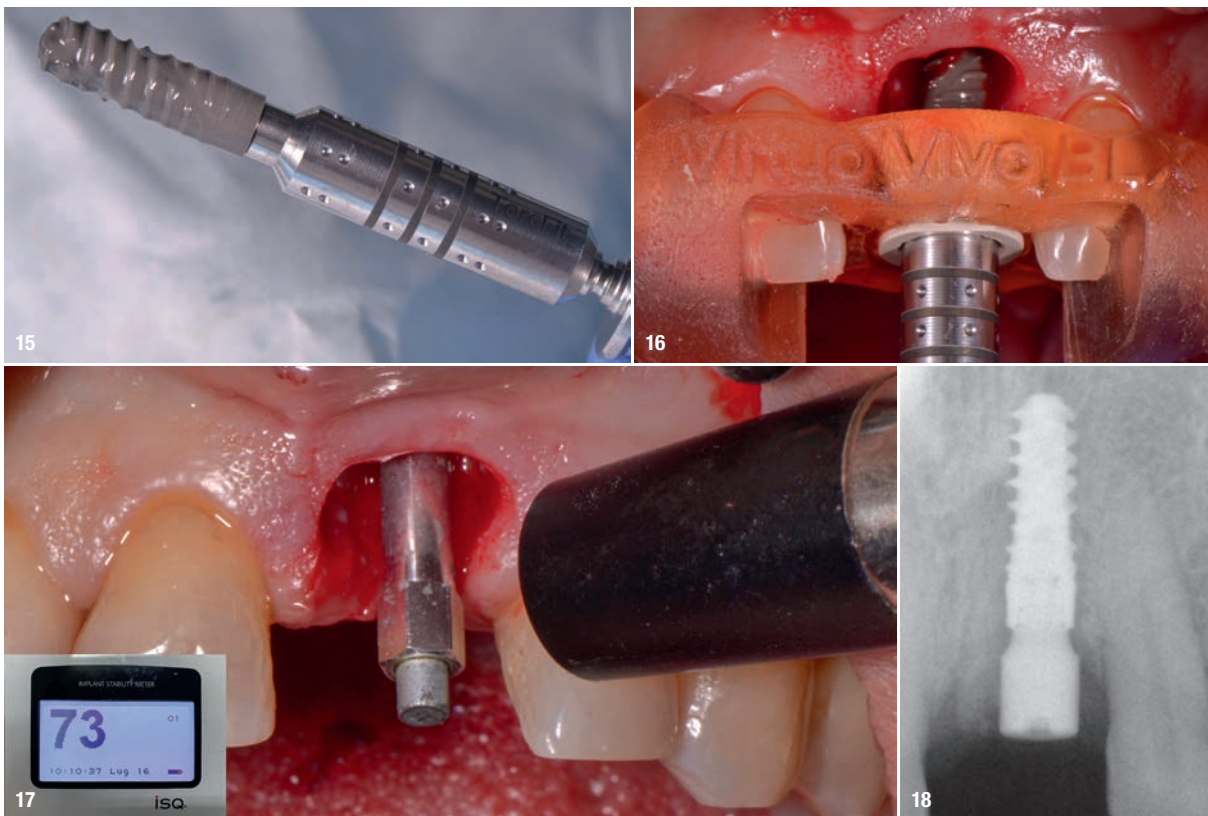
Once the planning had been completed, the surgical guide was designed and the corresponding information was sent to the Magma Center laboratory, in Italy, where the guide was printed in 3D with a Straumann CARES P40 printer (Fig. 10). These guides are created employing LPD print technology, and when placed, they fit in a very satisfying way, especially in the case of tooth-supported surgical templates.¹

Surgical procedure

The template was placed and proved to be very reliable, precise and stable (Fig. 11). After the administration of local anaesthesia, tooth #21 was extracted atraumatically (Fig. 12).

According to the specific BLX surgical protocol, the presence of soft bone allowed us to use the 2.2 mm diameter VeloDrill pilot drill (Straumann) and the 2.8 mm diameter

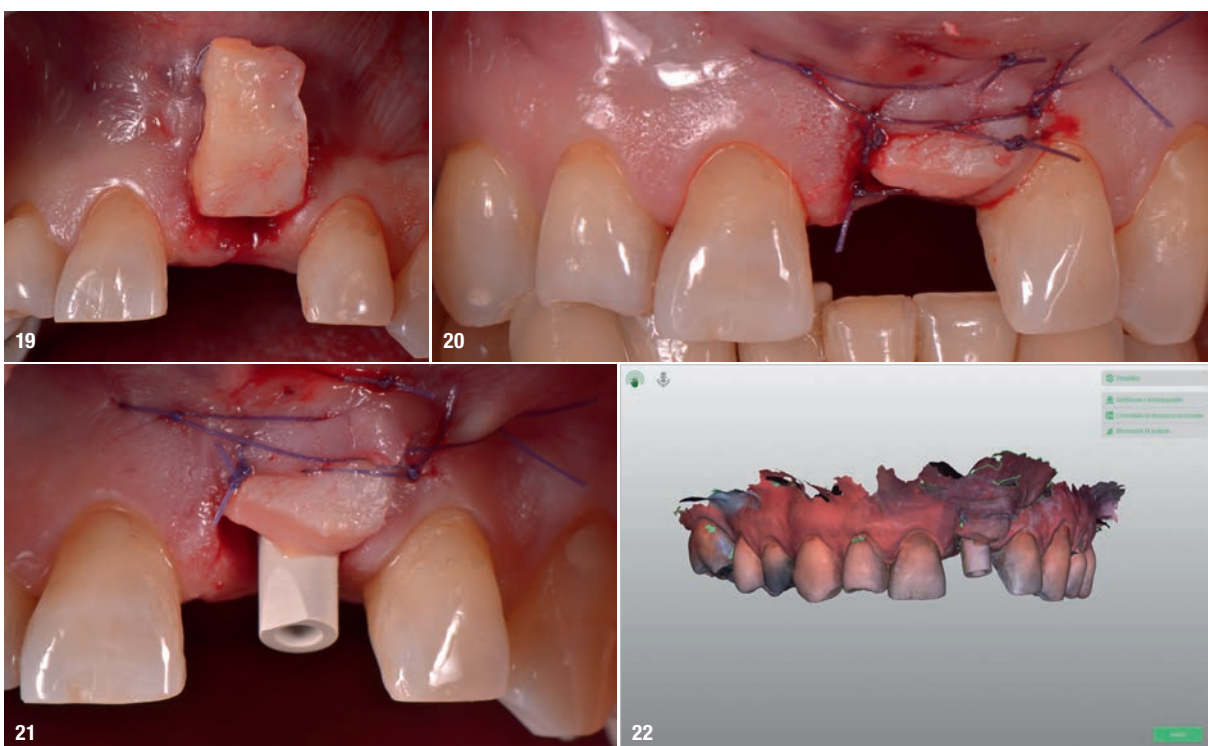


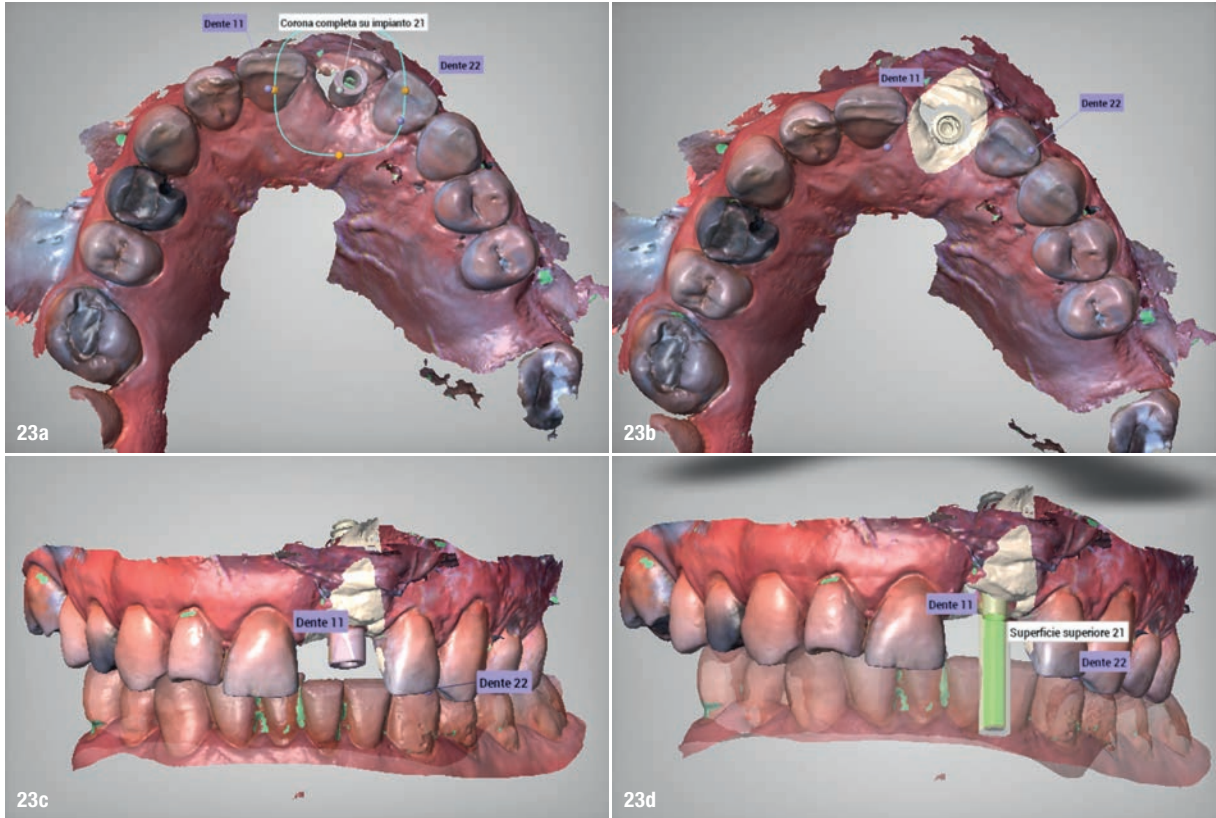


VeloDrill for the implant bed preparation with abundant irrigation with saline solution (Figs. 13 & 14).

The surgery was carried out by flapless procedures, following the standard phases of computer-guided surgery. The im-

plant was placed using a specific mouter through the sleeve in an accurately chosen position (Figs. 15 & 16). We obtained optimal primary stability and ISQ and were thus able to proceed with the immediate loading (Fig. 17). The follow-up radiograph showed the excellent precision obtained in implant



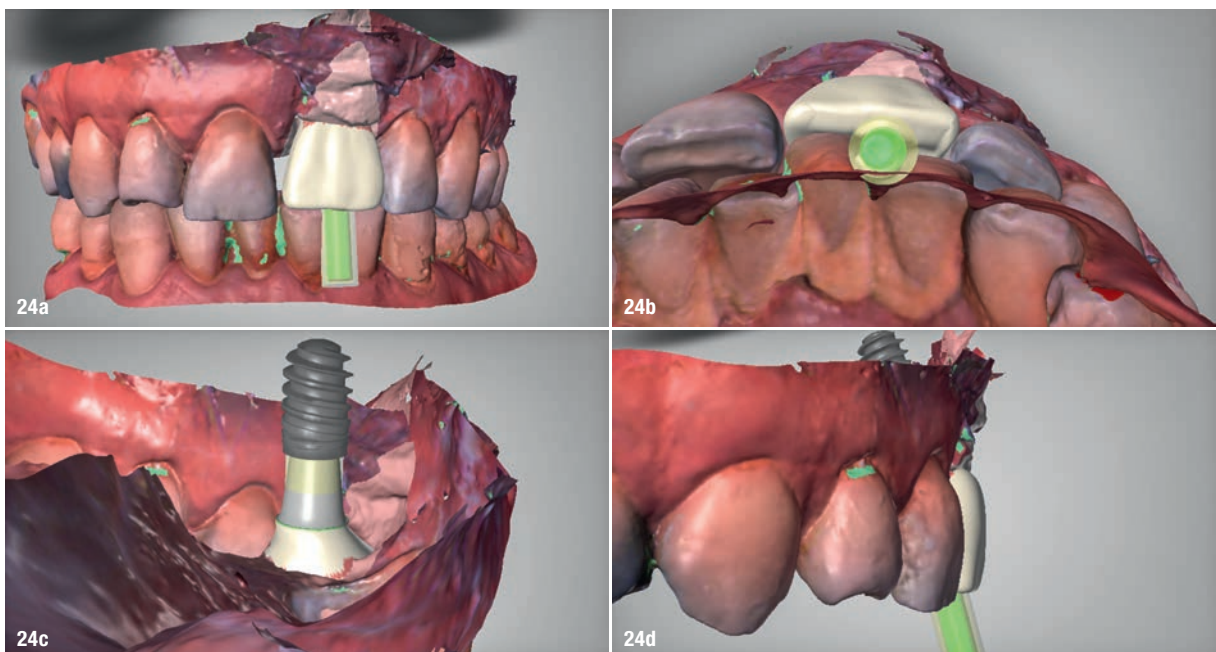


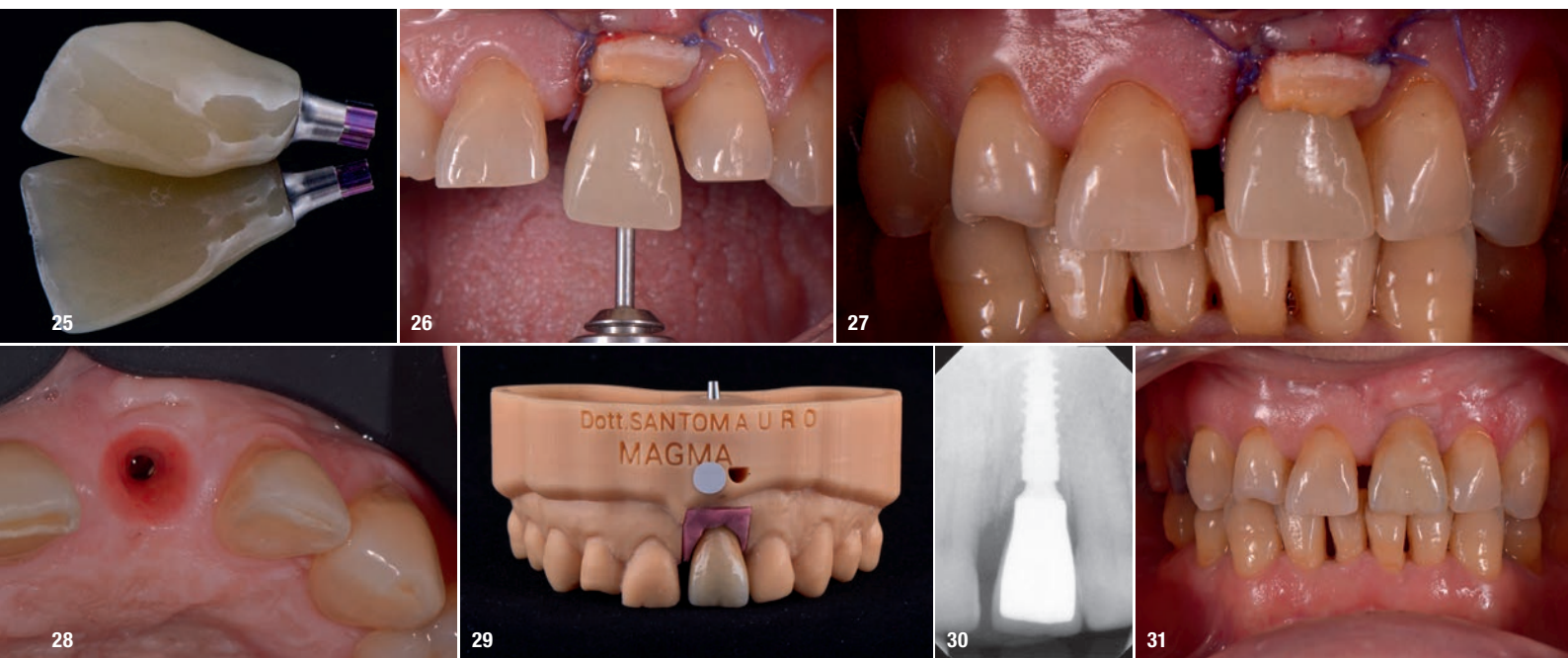
positioning, which faithfully reproduced in the patient's mouth what had been accurately planned on computer (Fig. 18).

Finally, an epithelium connective tissue graft was taken from the palate in order to use an envelope technique to optimise the soft-tissue profile, act as a vestibular closure and support the bone-implant gap, which was filled with cerabone bone substitute (botiss biomaterials; Figs. 19 & 20).

Prosthetic procedure

The Virtuo Vivo scanner allowed us to take a digital impression of the implant position in order to create a temporary crown using a Variobase abutment (Straumann; Fig. 21). The resulting PLY scan file was sent to the laboratory through CARES Connect (Straumann) to create the temporary prosthetic crown (Fig. 22). CARES Visual was used to adjust the





temporary crown, making sure that no contacts occurred in centric and protrusive movements (Figs. 23 & 24).

The CAD was milled in Temp Multilayer PMMA (Straumann) and glued on to a Variobase abutment with RelyX Unicem 2 cement (3M; Fig. 25). The temporary crown was screwed to 15 Ncm (Fig. 26). The temporary restoration was immediately adapted from an aesthetic and functional point of view and did not require any changes thanks to the accurate digital planning (Fig. 27).

Owing to global pandemic situation, a second provisional restoration was adapted six months after the surgery. The patient attended a follow-up visit for the final prosthetic procedures. After removal of the temporary restoration, optimal peri-implant soft tissue was observed (Fig. 28).

The definitive prosthesis was prepared in a digital workflow using Virtuo Vivo and CARES Visual. The scanner captured the 3D position of the implant with the aid of a scan body screwed into the BLX implant (Fig. 29). The definitive crown made of layered zirconia and a Variobase abutment for crown, regular base (diameter: 4.5 mm; transgingival height: 1.5 mm) was delivered, and a control radiograph was taken (Fig. 30). As requested by the patient, the new prosthesis was in harmony with the surrounding teeth and had a natural appearance (Fig. 31).

Treatment outcomes

The fully digital workflow reduces chair time and speeds up patient turnover, guaranteeing immediate provisionalisation, reduced patient discomfort and immediate soft-tissue conditioning. The accurate analysis of the case and treatment planning using all the digital tools at our disposal

allowed us to reduce the possibility of mistakes and have a very predictable clinical outcome. The Straumann BLX system is the perfect solution for the positioning and immediate loading of the implant itself, thanks to its anatomical design, TorcFit connection, surface and material.

Acknowledgement

We would like to thank the Magma Center dental laboratory (Castellammare di Stabia NA) for helping with the digital planning and the prosthetic restoration.

Reference

1. Kühl S, Payer M, Zitzmann NU, Lambrecht JT, Filippi A. Technical accuracy of printed surgical templates for guided implant surgery with the coDiagnostiX™ software. *Clin Implant Dent Relat Res.* 2015 Jan; 17 Suppl 1:e177–82. doi: 10.1111/cid.12152.

about



Dr Vincenzo Santomauro graduated in dentistry and dental prosthodontics from the University of Naples Federico II in Italy in 2002. He has attended many postgraduate implantology courses both in Italy and abroad. He has been a member of the International Team for Implantology since 2007 and a speaker for the association

since 2012, ITI Fellow since 2020. He has written a number of scientific publications focusing particularly on digital implant prosthetics and has attended many national conferences as a rapporteur. He has recently improved his knowledge of the digital implant prosthetic flow, specialising in the use of guided surgery and the intra-oral scanner for digital impression taking. He works as a freelancer in Battipaglia and Salerno in Italy.

Ivoclar Vivadent Live Experience Tour— coming together across Europe

By Claudia Duschek, Dental Tribune International

The global COVID-19 pandemic has partially shut down the global dental industry and restricted in-person meetings for over a year. As things are slowly getting back to normal, Ivoclar Vivadent, a leading international supplier of integrated solutions for high-quality dental applications for dentists and dental technicians, is embarking on a four-month tour through 15 European cities in order to bring its products and key opinion leaders to its customers' doorsteps.

The Ivoclar Vivadent Live Experience Tour will offer the company's customers a one-of-a-kind platform with educational and networking opportunities—all free of charge. "We understand from our customers that a regular exchange with their colleagues about the latest topics and trends in dentistry is vital for their business and personal development," said Ivoclar Vivadent Chief Marketing Officer Patric Frank, summarising the rationale behind the event series in a recent interview with Dental Tribune International.

"We took the decision not to participate in the International Dental Show in spring this year already. At that time, the pandemic situation for the rest of the year was still very much uncertain," Frank explained. "With the localised tour, we are providing our customers with a solution that is in line with the latest local health regulations and involves less



Fig. 1: "We can't wait to catch up with our customers all over Europe," said Patric Frank, chief marketing officer at Ivoclar Vivadent. **Fig. 2:** The Ivoclar Vivadent Live Experience Tour will include events in Austria, Denmark, France, Germany, Italy, the Netherlands, Poland, Portugal, Spain, Switzerland and the UK.

travelling, as cross-border travel is becoming increasingly difficult again. During the tour, we can meet customers in their own country at a location close to them."





Fig. 3: Dental professionals who would like to join the tour have to register online on the Ivoclar Vivadent website in advance. (All images: © Ivoclar Vivadent)

A roaming showcase with a strong focus on education

From September 2021 to early 2022, dental professionals across Europe will have the opportunity to learn first-hand from some of the most experienced experts in the dental field, reconnect with their peers and explore Ivoclar Vivadent's innovative workflows. With at least three sessions for each two-day event, the tour will have a strong education component—something that “has been and will remain a priority for Ivoclar Vivadent to support our customers,” Frank confirmed.

The Live Experience Tour is Ivoclar Vivadent's platform for unveiling its latest products, software and services this year. “The new products will be launched within the matching workflow, as we believe that products need to be optimised within a dedicated workflow to enable our customers to achieve the highest aesthetics and efficiency,” Frank said. At each tour stop, product presentations will be complemented by interactive educational sessions and products for customers to test, such as milling machines, scanners and printers. “While products remain at the core of our workflows, we are taking the bigger picture into account, linking them to the other important factors in the work of our customers,” Frank clarified. “Ivoclar Vivadent has always considered itself as a vital link between the dental practice and the laboratory. The presentations and educational sessions therefore are also aimed at fostering collaboration between the two entities.”

Among other topics, the following will be in focus:

- direct filling therapy with the Tetric line of four coordinated composites and 3s PowerCure, an innovative blue phase curing light system for intra-oral polymerisation;
- CAD/CAM chairside treatment with the recently launched PrograScan intra-oral scanners and Programat CS6 furnace, supporting fast crystallisation of IPS e.max CAD;
- the combination of pressing and printing with the recently launched Programat furnaces and PrograPrint PR5 3D printer; and
- the Ivotion denture system, which offers a complete digital manufacturing process, allowing laboratories to create top-quality removable dentures.

Frank further revealed that one highlight of the tour will be the global launch of two new products—one for dentists in the adhesion product portfolio and the other for dental laboratories in the zirconia restoration range.

Tour participants will learn about a number of updates, including the latest version of IvoSmile with CAD integration, for which they will receive an annual licence.

The right locations for a safe experience and intimate atmosphere

In order to safeguard the health and safety of its customers, Ivoclar Vivadent has worked closely with local experts at each location. The company has also chosen its tour stop locations wisely to provide enough space for a pleasant and relaxing atmosphere that will allow excellent networking opportunities.

Frank summarised: “The Live Experience Tour is the chance to meet in person again, not only with the wider Ivoclar Vivadent team, including product developers and sales representatives, but also with other dental professionals for business and informal conversation while enjoying great food and drinks in unique locations. Most importantly, each tour stop will be a chance for our customers to share their feedback and wishes with Ivoclar Vivadent as we strive to constantly improve our products and services for the benefit of the user. We can't wait to catch up with our customers all over Europe.”

The number of participants per event is limited and in-advance registration is mandatory. However, at least three time slots per city will be offered. While safety protocols will be adapted to local regulations, wearing of face masks will be required in all indoor areas and all participants will be asked to provide a SARS-CoV-2-negative test.

More information about the different tour stops and the respective programmes, as well as the registration form, can be found at www.ivoclarvivadent.com/live-experience.

Predictable immediate **guided implant placement** and provisionalisation

Dr Ara Nazarian, USA

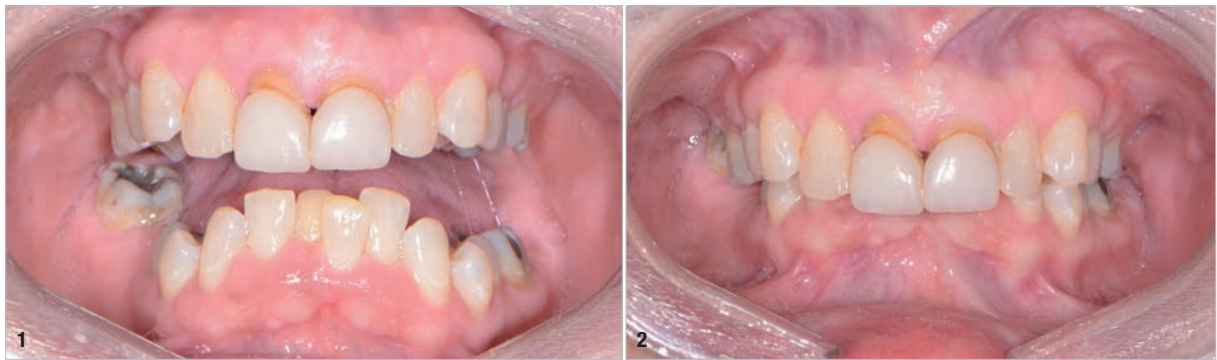


Fig. 1: Pre-op retracted frontal view. **Fig. 2:** Pre-op retracted biting view.

Introduction

When a patient presents to your dental practice with questionable and/or non-restorable teeth requiring full-mouth extractions, the greatest concern is whether or not implants can be placed in the same surgical visit and if so whether the patient will be able to walk out with fixed teeth. Having an implant system within your practice that allows you to load or progressively load, so that these patient's demands are met, allows you to position your practice at a whole new level. Of course, certain parameters must be met in order to facilitate this type of treatment. This includes, but is not limited to the quality and quantity of bone, the presence of infection, the patient's health and the skills of the dental provider. Additionally, the selection of the most appropriate materials for the most ideal situation must be met.

Clinical case

A patient presented to my practice for a consultation wanting to restore her dentition to proper form and function

(Fig. 1). She complained of generalised discomfort and mobility in these teeth, apparently due to advanced periodontal disease. There were several teeth in both arches that had Grade III mobility upon clinical examination. Also, there was hyper-eruption in the anterior mandibular dentition due to her jaw position with a deep impinging bite (Fig. 2).

The clinical evaluation included information regarding lip length and support, the position of the natural teeth, occlusion, restorative space and phonetics. In addition, digital images of frontal, side and occlusal views of the dentition as well as facial shots were captured with a Nikon D7200 (PhotoMed).

A CBCT scan and panoramic radiograph using the CS 8100 3D device (Carestream Dental; Fig. 3) were taken to accurately capture the information needed to properly plan the treatment for this case that would ensure the most ideal outcome, especially since the patient had discussed how unhappy she was with her existing smile. Using the CS 3D imaging software (Carestream Dental), dental implants were virtually planned in key positions in both arches (Fig. 4).

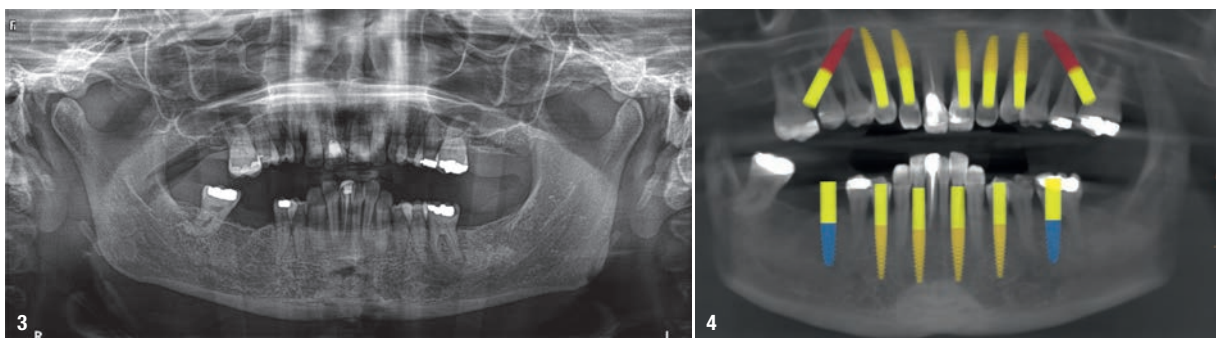


Fig. 3: Pre-op panoramic radiograph. **Fig. 4:** Planning with the CS 8100 3D device.



Fig. 5: Surgical guides and provisional restorations. **Fig. 6:** Touareg-OS dental implants.

To further develop the treatment plan, diagnostic model impressions were taken using Silginat polyvinylsiloxane impression material (Kettenbach), poured up and forwarded to the dental laboratory. These models were then mounted on an articulator (Stratos 100, Ivoclar Vivadent) for further analysis in order to meet the patient's aesthetic and functional needs.

Financing options using a third-party payment option (LendingClub) were discussed with the patient. This discussion was a very important part of facilitating acceptance of her care, since it made the cost of treatment more feasible.

A 3D virtual treatment plan was further developed from our planning with the CS 3D imaging software, integrating it with the photographs and models. A virtual online integrative meeting with the dental laboratory allowed for a comprehensive review of the assembled digital and clinical information to formulate an optimal treatment plan that would fulfil the necessary requirements for aesthetics, form and function. Within a short amount of time, the dental laboratory had fabricated all the necessary guides for positioning, levelling, drilling and implant placement, in addition to the PMMA provisional restorations and back-up dentures (Fig. 5).

It is my belief that surgical guides in implant dentistry increase the predictability of treatment outcomes as well as make the clinician extremely efficient. In the past, implant placement routinely took place freehand, but this approach

heightened the risk of damage to anatomical structures and lengthened the duration of the surgery. I personally feel that surgical guides give clinicians more confidence in accurately placing implants in every case, whether general practitioners or specialists. Precision surgery reduces stress, decreases liability and leads to a better outcome for the patient.

The implants that would be utilised for this case were Touareg-OS dental implants (Adin Dental Implant Systems; Fig. 6). The Touareg-S and Touareg-OS spiral implants are tapered with a spiral tap that condenses the bone during placement for immediate stability. There are two large variable threads and a tapered design for accurate implant placement, self-drilling, improved aesthetics and better load distribution. In addition, Touareg-OS implants feature the company's biocompatible and osteoconductive OsseoFix implant surface. This has proved to achieve the desired roughness levels for optimal osseointegration, attain the highest implant surface purity levels and increase the success rate of bone-to-implant contact.

Once the virtual plan had been orchestrated and fully confirmed, the next appointment was for the planned surgery with all the necessary components for the guided surgical approach. The patient was appropriately sedated with intravenous medications, and local anaesthesia was administered in both arches. The tissue was then reflected using the Reflector instrument (GoldenDent) so that the bone levelling surgical guide would be fully seated and fixed with its respective retention screws (Fig. 7). After the positioning of



Fig. 7: Maxillary bone levelling foundation guide. **Fig. 8:** Guided surgery dental implant kits.

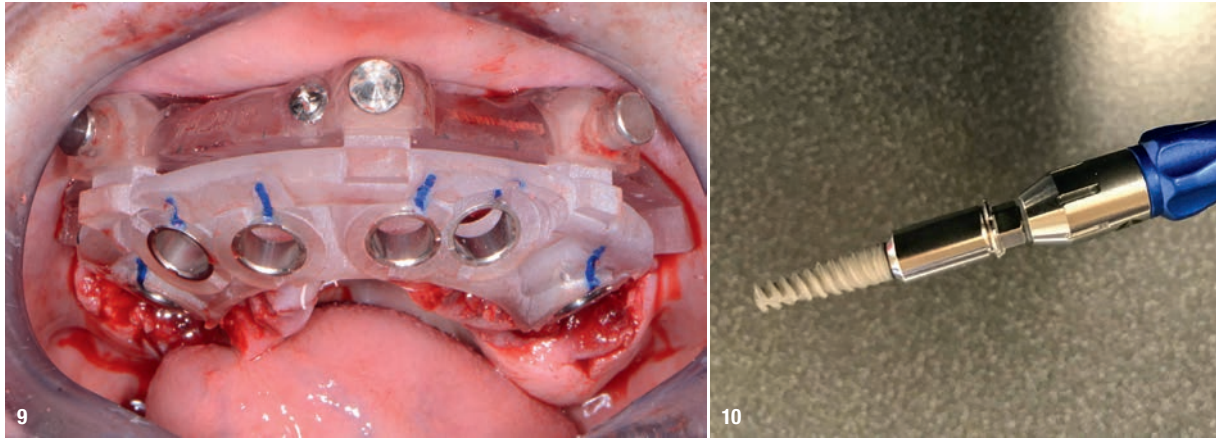


Fig. 9: Maxillary implant surgical guide. **Fig. 10:** Touareg-OS dental implant.

the surgical guide, the maxillary teeth were atraumatically extracted utilising the Physics Forceps (GoldenDent). Once the appropriate bone levelling had been accomplished with the surgical handpiece, the implant surgical guide (Fig. 8) was positioned into the bone levelling guide and the osteotomies for the implants were initiated with a designated pilot drill in the implant system's guided surgery drill kit (Adin Dental Implant Systems; Fig. 9).

ration and placement of dental implants for dental practitioners. It also features easy-to-follow layouts along containing self-centring drills with built-in stoppers. The unique design of the guide, employing ActiveFlow irrigation technology, directs cooling saline through the guide, ensuring that irrigation reaches the bone and thereby reducing the possibility of bone heating throughout the procedure.

Using precise orientation, depth and direction, the guided surgery kit provides fast, effective and predictable prepa-

Utilising the Mont Blanc surgical handpiece and AEU 7000 surgical motor (both Aseptico) at a speed of

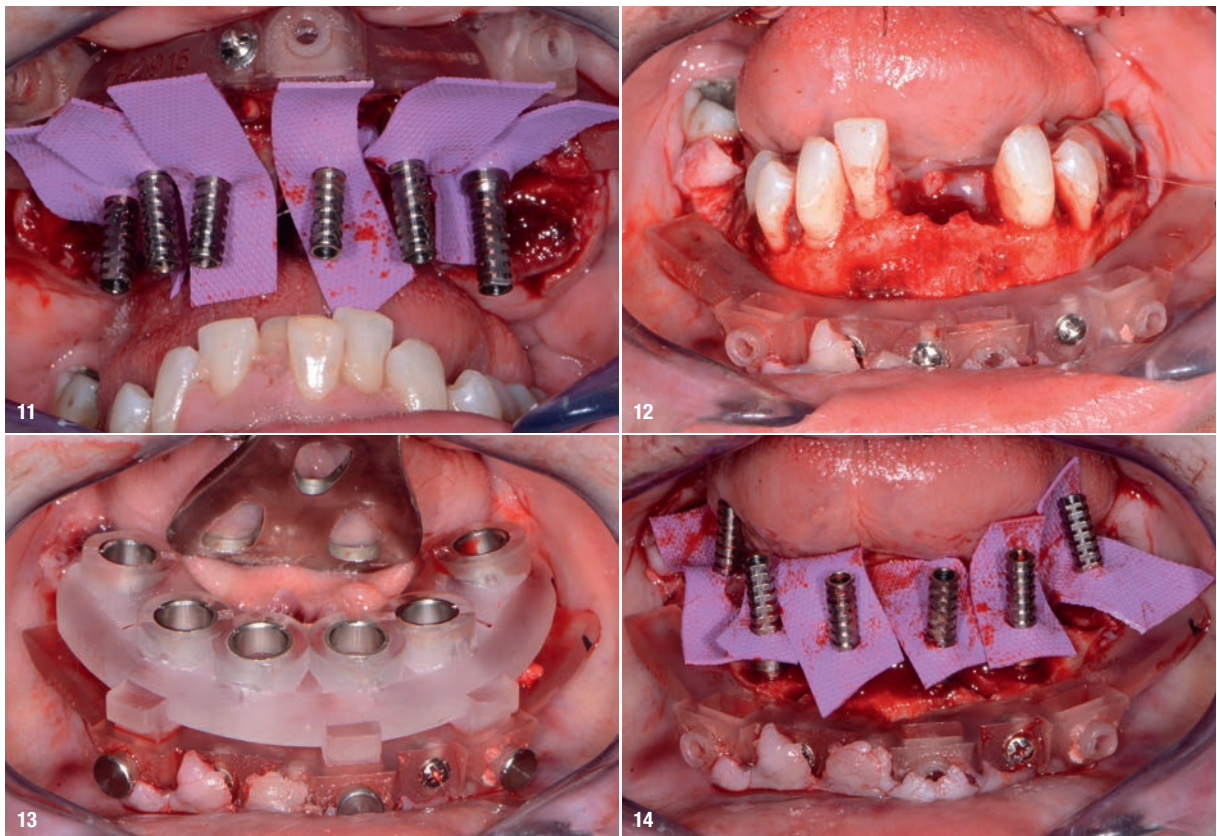


Fig. 11: Maxillary temporary cylinders isolated. **Fig. 12:** Mandibular bone levelling foundation guide. **Fig. 13:** Mandibular implant surgical guide. **Fig. 14:** Mandibular temporary cylinders isolated.

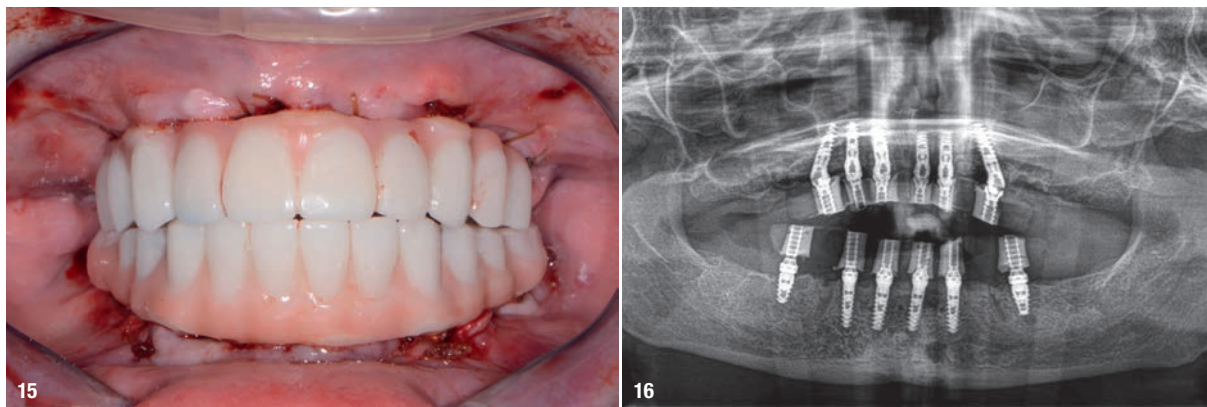


Fig. 15: Maxillary and mandibular provisional restorations. **Fig. 16:** Post-op panoramic radiograph.

800rpm with copious amounts of sterile saline, sequential drill preparation was initiated. Once the osteotomies were complete, the drivers in the guided kit (Adin Dental Implant Systems; Fig. 10) were used to place the dental implants with precise timing so that the flat portion of the internal hex was positioned ideally for receiving the multi-unit abutments.

A baseline implant stability quotient (ISQ) reading was taken of these implants utilising the Penguin RFA unit (Aseptico). Since the initial readings were all above 70 ISQ, and the quality of bone after levelling was good, multi-unit abutments (Adin Dental Implant Systems) were tightened into the Touareg-OS dental implants to 30Ncm, followed by temporary cylinders to 15Ncm.

Any residual areas around the implants or in the sockets were grafted with a mineralised and demineralised cortical bone grafting material (GoldenDent) to optimise the area for regeneration.

The prefabricated immediate provisional arch restorations with pre-drilled access openings were inspected before being tried in.

The maxillary provisional restoration was tried in to verify a passive fit over the temporary abutments. Once fit had been confirmed, trimmed dental dam pieces were placed to avoid the restoration (Fig. 11) from locking on during the relining procedure with REBASE III FAST set hard reline material (Tokuyama Dental). After the material had polymerised, the immediate provisional restoration was removed and any access material was removed with the Torque Plus laboratory handpiece (Aseptico) and an acrylic bur (Komet). The same procedures were accomplished in the mandibular arch (Figs. 12–14). Once trimmed and polished, the provisional restorations were seated and tightened with a torque wrench at 15Ncm (Fig. 15). The access openings were filled in three-quarters of the way with Teflon tape, followed by Cavit filling material (3M ESPE). A postoperative panoramic radiograph was taken immediately after the surgery (Fig. 16).

A few days later, the patient returned for her postoperative appointment with very little discomfort, swelling or bruising. She was very pleased with her new maxillary and mandibular fixed provisional restorations. The occlusion was further checked and adjusted to confirm that there were no interferences in lateral or protrusive movements. The next step in her treatment would consist of full-arch impressions for the definitive restorations approximately four to five months postoperatively.

Conclusion

Having the ability to take a patient from start to finish in a fewer number of appointments within your practice allows you to position yourself as a provider that can fulfil your patient's surgical and restorative needs. With the proper training and appropriate materials, a dental provider may provide extraction, grafting and implant placement within one appointment at one location. Not only does this allow you to reduce the number of visits for the patient, but this type of service also helps minimize the cost to the patient, since he or she is not seeing multiple dental providers. Most importantly, this enables the dental provider full control of the surgical and prosthetic outcome. Depending on the patient's desires, the clinical conditions of the oral environment and the skills of the provider, a dentist may choose to extract teeth, level bone and graft with guided dental implant placement within his or her dental practice.

about



Dr Ara Nazarian maintains a private practice in Troy in Michigan in the US with an emphasis on comprehensive and restorative care. He is a diplomate of the International Congress of Oral Implantologists. He has conducted lectures and hands-on workshops on aesthetic materials, grafting and dental implants throughout the US, Europe, New Zealand and Australia.

Successful immediate implant loading—According to the Socket Shield Technique

Dr Ramón Gómez Meda, Spain



Figs. 1a & b: Initial situation before partial extraction of the fractured tooth and immediate implant placement. The epigingival fracture made a horizontal reduction of the root unnecessary.

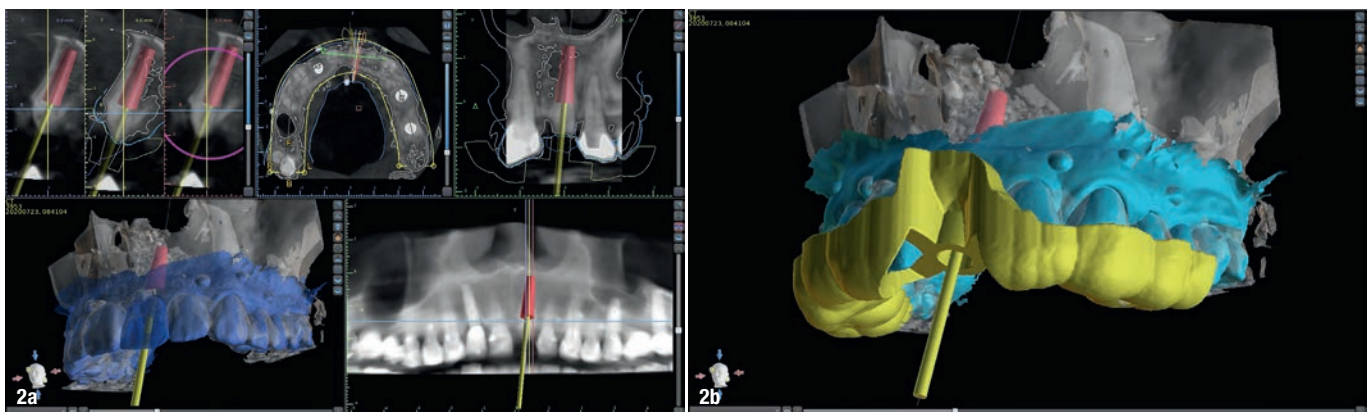
Introduction

In 2010, a novel approach to preserve the soft and hard tissues following tooth extraction was reported.¹ Clinical studies had suggested that retaining roots of hopeless teeth may avoid tissue alterations after tooth extraction. The authors proposed the retention of a buccal aspect of the root during immediate implantation to prevent alveolar bone loss following tooth extraction. The proof-of-concept study in beagle dogs showed that retaining the buccal aspect of the root during implant placement does not appear to interfere with osseointegration and may be beneficial in preserving the

buccal bone plate. Since then, the Socket Shield Technique has been further evaluated clinically in its application as originally described by Hürzeler et al. or in complex situations such as multiple adjacent implants with pleasing aesthetic results.¹⁻⁴ The latest critical literature review by Blaschke et al. about the clinical data support on the Socket Shield Technique summarised promising outcomes with the Socket Shield Technique, its high potential to reduce the need for invasive bone grafts around implants in the aesthetic zone, but also concluded that clinical data to support is very limited.⁵ Nevertheless, this technique cannot be implemented in routine dental practice without caution as it is quite technique-sensitive and thus, should be reserved for the experienced surgeon. The following case report describes an immediate implant placement, fully guided applying the Socket Shield Technique as an efficient treatment concept, with a favourable cost-benefit ratio and highly aesthetic outcome.

Clinical case

In the following case, a 69-year-old male with good health condition (ASA I) presented in the office with a fracture of a central incisor. The full mouth had been previously restored with lithium disilicate crowns due to the severe attrition the teeth suffered as a consequence of the intense bruxism and clenching the patient reported. Anterior crowns were splinted but even so the crown of the tooth broke horizon-



Figs. 2a & b: The DICOM files as well as the intra-oral STL files were imported into a software (Blue Sky Bio) to plan the ideal implant position. Finally, a surgical guide was printed.

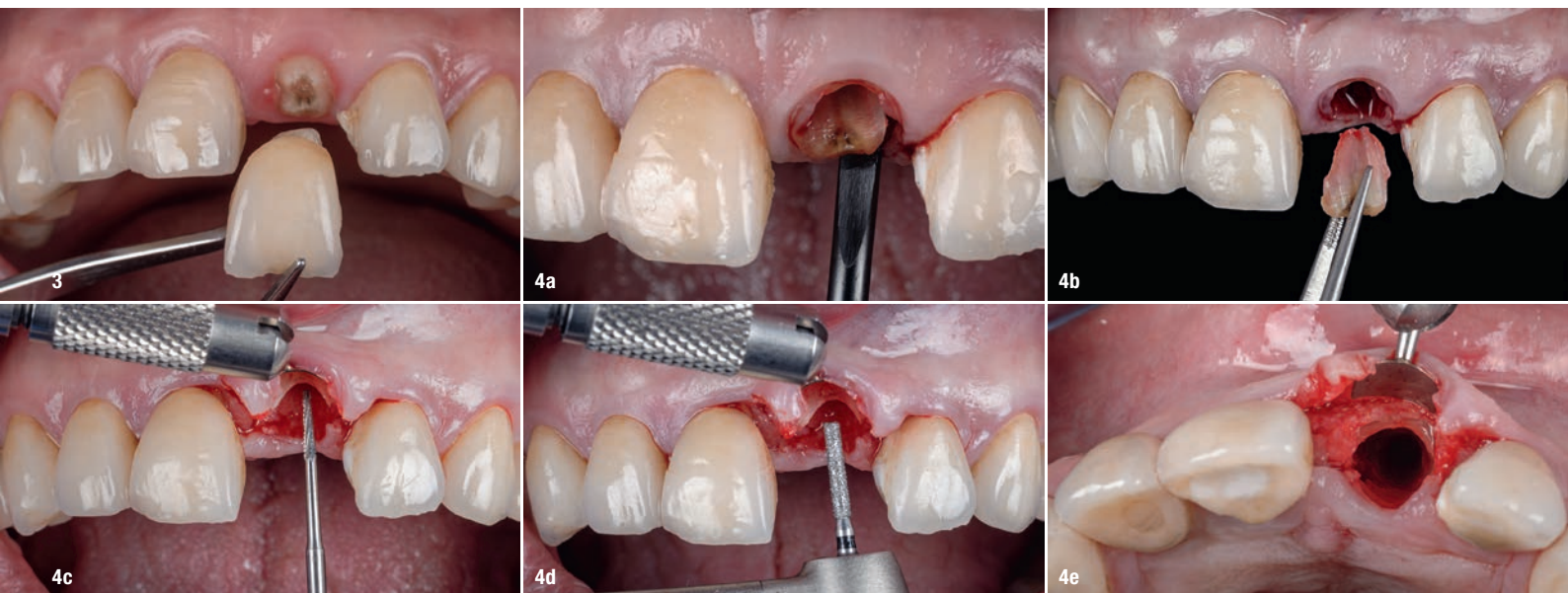
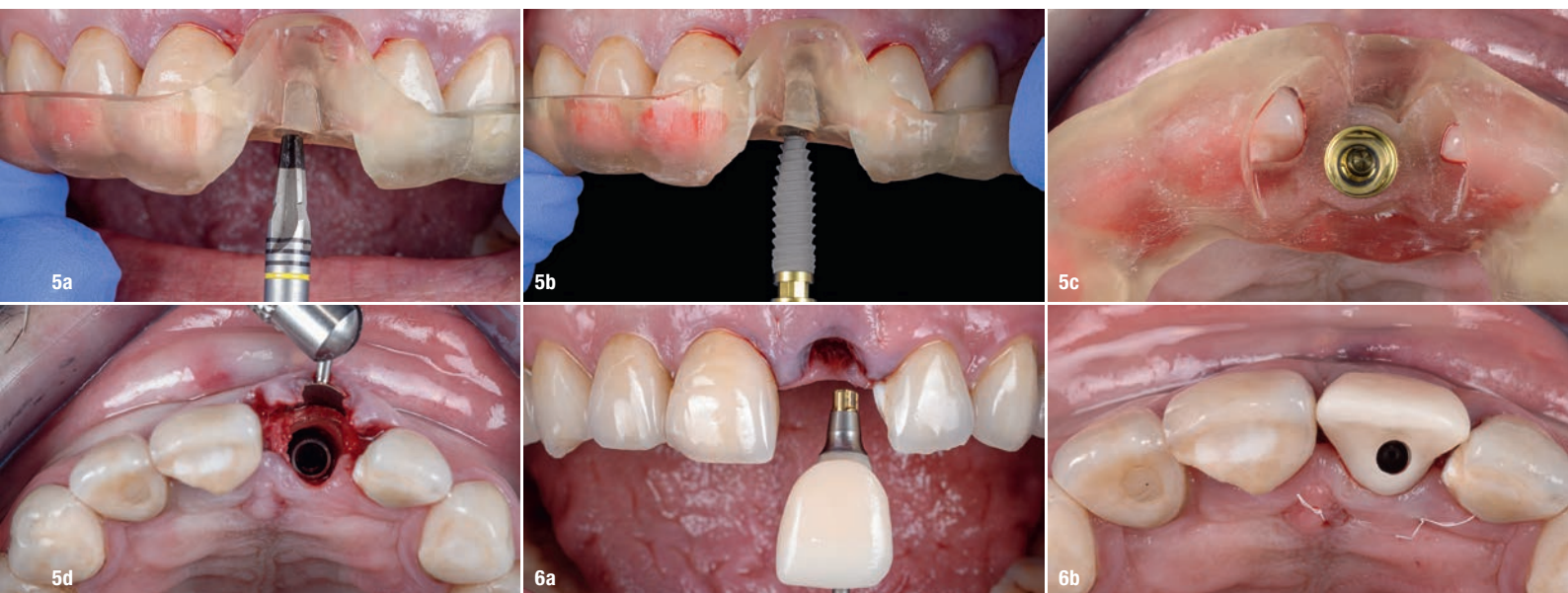


Fig. 3: After impression taking, the fractured crown was sent to the laboratory technician to copy the shape and colour. **Figs. 4a–e:** Partial tooth extraction with Socket Shield approach: bisection of the root, extraction of the palatal parts and contouring of the buccal shield.

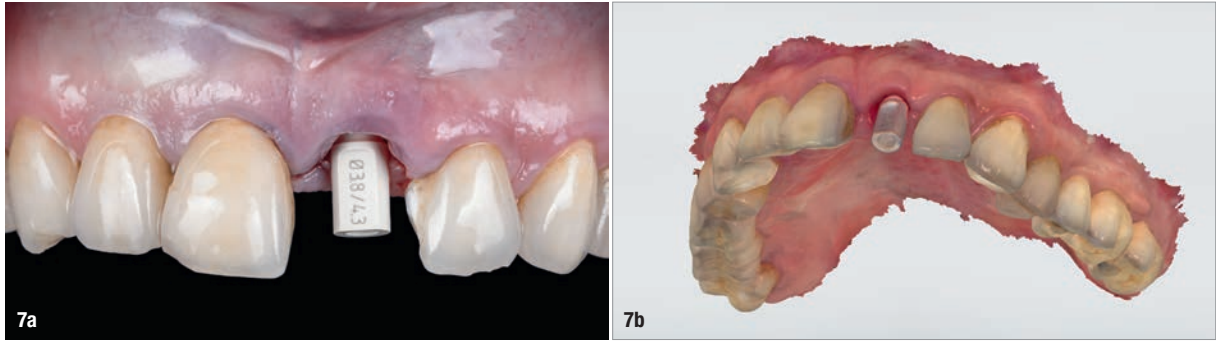
tally at gingival level. The pulp sensitivity test of the fractured tooth with CO₂ snow was negative, the peri-coronal tissue was irritated, but showed absence of active purulent infections. Hard and soft tissue showed no signs of bone loss or recession, in comparison of the soft tissue and bone support of the two maxillary quadrants there was no difference from one quadrant to the other. Radiologically the root remnant showed no alterations or signs of fracture (Figs. 1a & b). Oral hygiene was good. Tooth conservation was assessed to be feasible but seemed rather unpredictable due to the lack of enough dentine to predictably support a crown in the

long term. Another alternative was to extract the root and to retreat the adjacent teeth with a fixed bridge. After a discussion of the treatment options and the respective risks and benefits, the patient agreed to substitute the tooth by an implant. The crown of the fractured tooth was temporarily positioned in place with the help of flowable composite.

An intra-oral scan of both maxillary and mandibular jaw (TRIOS, 3Shape) to produce the guide template was taken. For planning of the implant position a CBCT scan was done (Planmeca Promax 3D Plus) paying special attention to the



Figs. 5a–d: Fully guided placement of the implant into the exact 3D prosthodontic position, in distance to the root shield. Care was given to not change the position of the buccal root shield. **Figs. 6a & b:** The interim restoration had been designed based on the intra-oral scan. It could be screwed onto the implant immediately after the surgery to close the extraction wound and preserve the soft tissue.



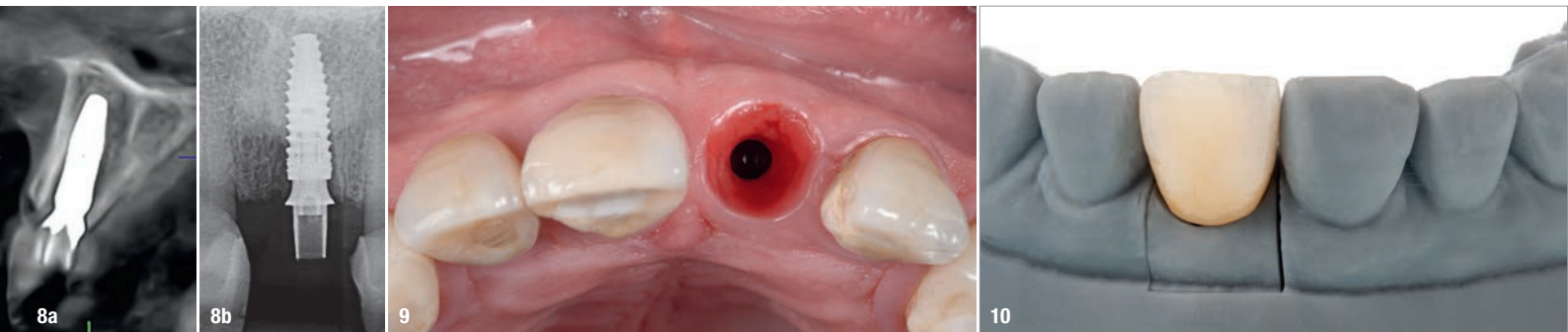
Figs. 7a & b: A scan body is used to immediately register the 3D position of the implant.

integrity of the cortical plate and the quantity of bone present in the apical area to be able to properly stabilise the implant. The DICOM files as well as the intra-oral STL files were imported into a software (Blue Sky Bio). These files were superimposed and a virtual wax-up helped to create the exact virtual position of the implant with an ideal prosthodontic emergence profile. Finally, a surgical guide was designed and immediately printed at the office with the help of a high-quality 3D printer (Nextdent 5100, 3D Systems; Figs. 2a & b). An alginate impression was taken to elaborate a thermoplastic vacuum formed provisional and the patient was released with a crown integrated into the removable template to temporarily solve the aesthetic problem. Antibiotics and AINES were prescribed for the day of the surgery. Also, the patient was advised to rinse his teeth with an antiseptic solution (0.2% chlorhexidine, DENTAID) the day before the surgery to reduce the bacteria load in the mouth. The crown of the fractured tooth (Fig. 3) was handed to the dental technician for orientation to build the screw-fixed temporary restoration on the implant for day of surgery.

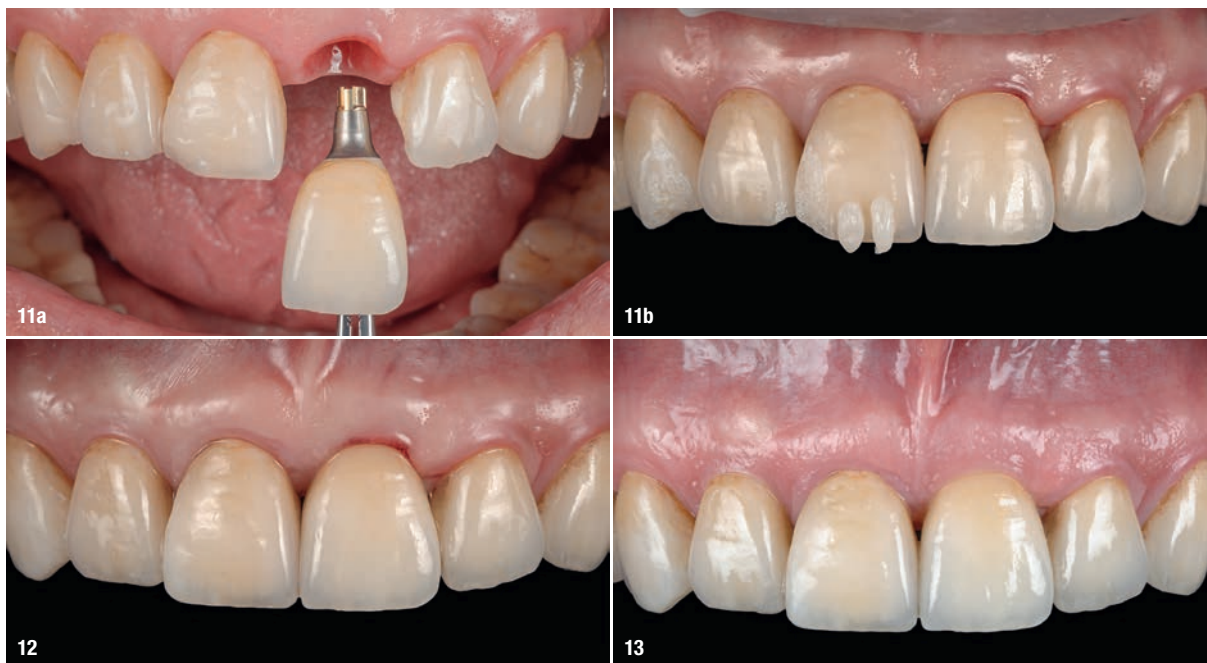
The guide template—previously designed by superimposing the intra-oral scan. STL file and the CBCT.DICOM files—was tested for exact fit and after local anaesthesia (4% articaine with 1:200,000 epinephrine) partial tooth extraction was performed. Weighing tissue resorption due to flap mobilisation against good overview on the surgery site, a very small dimensioned buccal full thickness flap preserving the papilla was mobilised in order to better control later tooth fragment

preparation and the surrounding tissue. Before implant bed preparation, the root was bisected vertically and the palatal aspect of the root was removed (Figs. 4a–e). Further dentine parts were removed in individual pieces, focusing to extract the entire root tip. The guide template was seated to prepare the implant bed through the root remnants. Sterile saline coolant was used during the entire drilling procedure. Only a small part of the root in the crestal area on the buccal side was intentionally left in place preserving the facial part of the periodontal ligament and as a consequence the bundle bone (Fig. 4e). As accurate tooth fragment preparation and implant placement is the key to successful treatment with the Socket Shield Technique,⁶ the buccal root piece needed a little reshape with a lancet drill to thin it and such to guarantee that the dentine would not be in direct contact with the implant for proper bone formation.

A PROGRESSIVE-LINE (CONELOG 3.8x13mm) implant was placed fully guided in the palatal part of the extraction socket in the correct 3D prosthodontic position (Figs. 5a–d). As being an apically tapered implant and threads down to the apex, this implant was chosen for the surgery as it enables to anchorage well within the basal bone but still not endangering the buccal lamella in the apical area. Also, the pronounced thread design makes it easy to reach very good primary stability even in situations with poor quality bone. Reaching an insertion torque of more than 35Ncm, the implant qualified to be restored immediately with a screw-retained one-piece provisional crown (Figs. 6a & b). There-



Figs. 8a & b: Radiological control of the position of the buccal root remnant and the implant. **Fig. 9:** After 8 weeks and removal of the provisional restoration the peri-implant region impresses by a voluminous and healthy soft tissue. **Fig. 10:** The final zirconia crown was produced following a fully digital workflow.



Figs. 11a & b: After seating the final prosthesis, slightly chipped adjacent crowns were repaired with composite. **Fig. 12:** Final situation the day the crown was delivered. **Fig. 13:** Follow-up 6 months later.

fore, a scan body had been screwed in immediately after implant placement to register the 3D position of the implant and scanned digitally (Figs. 7a & b). The interim restoration was designed in the office after importing the STL file into a professional software (Exocad dentalCAD) and after half an hour the provisional was manufactured with a milling machine (Ceramill Motion 2 5X, Amann Girrbach). Afterwards the wound was microsurgically sutured (Cytoplast 6/0 PTFE) to fix the flap in position. The interim restoration was cemented onto a Ti-base (CONELOG Titanium base CAD/CAM crown, CAMLOG) with a resin cement (SpeedCEM plus, Ivoclar Vivadent). This provisional customised healing abutment placed immediately after the implant placement covered exactly the extractions wound and helped in maintaining the soft-tissue contours. A control radiograph confirmed the right position of the implant, the position stability of the shield and the correct distance from the tooth shield to the implant (Figs. 8a & b). After 2.5 months of healing, an optimal soft-tissue emergence profile was obtained (Fig. 9) and final restoration was delivered after 10 weeks (Figs. 10–12). Six months after insertion of the final restoration the crown is perfectly integrated (Fig. 13).

Conclusion

This case illustrates an experimental technique for preserving a buccal root segment in conjunction with immediate implant placement and provisionalisation. The Socket Shield Technique shows to be a valuable technique to minimise buccal contour changes after tooth extraction, leading to increased volume stability of the mucosa adjacent to the inserted implant. Even if the clinical application of the Socket

Shield Technique is still difficult to perform and very technique sensitive, with an apically tapered implant geared to high primary stability like PROGRESSIVE-LINE, the dentist has good control of the implant position and can reach a rather favourable cost-benefit ratio when using this technique. With this case it is also shown that the implant used is a reliable option for immediacy cases with fully-guided options, taking advantage of a fully digital workflow.

Editorial note: This article was first published in implants—international magazine of oral implantology, Vol. 22, Issue 2/2021. A list of references is available from the publisher.

about



Dr Ramón Gómez Meda holds a degree in dentistry from the University of Santiago de Compostela. In addition, he holds a Master's degree in Occlusion and Temporomandibular Dysfunction and has completed a Postgraduate course in Periodontics and Implantology. Since 2001, he has been leading a private practice in Ponferrada

in Spain. Dr Meda is an international lecturer on Periodontics, Implantology, Aesthetics and multidisciplinary treatments.

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Fun with Primescan and Atlantis

Dr Anthony Ponzio, USA



my favourite types of cases, where we can really make a difference for someone. The patient was an 80-year-old woman who had been wearing an ill-fitting partial denture for a while and was losing weight because eating was very difficult. She had some significant health issues and was told by another practitioner that she could not have implants, which was obviously inaccurate. She saw an oral surgeon whom we work with for placement of three implants, and he sent her to me. Now, there were certainly plenty of other restorative concerns, but we wanted to address the immediate issue and restore her function.

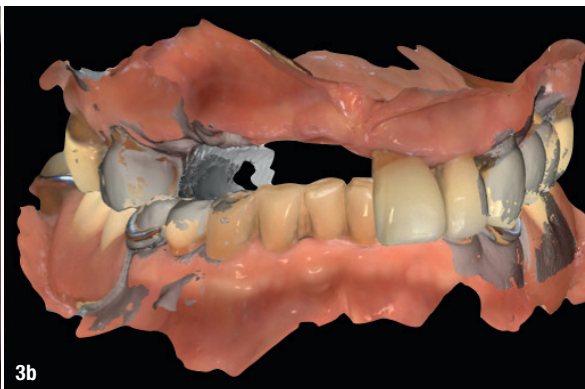
The patient had a tight upper lip, which made photographs a challenge, but it also helped us restoratively because she had a low lip line and there had been significant atrophy in the area over time (Fig. 1). We debated pink porcelain over longer teeth, but as was clear in the definitive restoration, it really did not matter aesthetically owing to the tight lip line.

For those who have been on the fence with CEREC Primescan (Dentsply Sirona), or have not tried the Atlantis workflow (Dentsply Sirona), I thought I would share this fun real-world case we just finished recently. These are





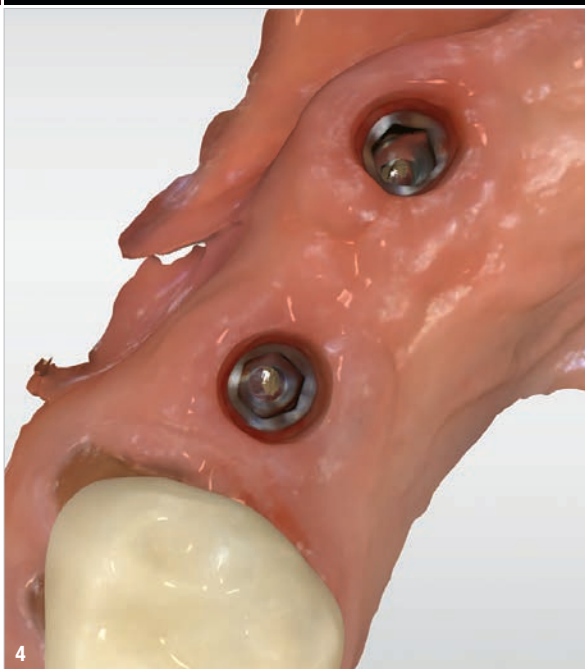
3a



3b

Primescan picked up everything, including the metal on the partial denture (Figs. 2a-d). The double buccal bite ensured that we were able to obtain a stable model (Figs. 3a & b). The depth of scan was impressive, right into the implants (Fig. 4). We placed the Atlantis IO FLO scan bodies and took our scans (Figs. 5–8). Again, the detail was extraordinary—the scanner even captured the clasps.

We sent the case to Atlantis for fabrication of the abutments. They were able to parallel everything and sent me the plan (Fig. 9). I approved the plan and they sent me the abutments and the core file for the bridge. I was able to send the core file via connect to the laboratory. At this point, I had not taken a single physical impression or touched a model, but had received the abutments and a definitive fixed partial denture was being manufactured.



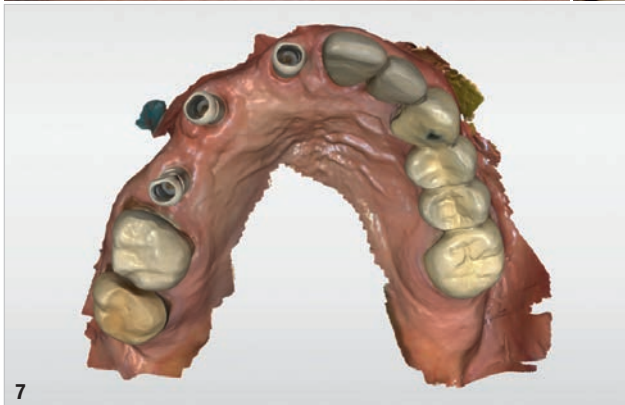
4



5



6



7



8



I also remembered this time to order the seating jig from Atlantis—which makes life so much easier (Fig. 10).

Once the bridge arrived from the laboratory, we had the patient come in, inserted the seating jig and delivered the abutments in a few minutes—such a smooth process. There was blanching of the tissue, but patient was never uncomfortable, and it went away after a few minutes (Figs. 11a & b & 12). We delivered the definitive bridge and we had a very happy patient (Fig. 13).

The patient called me the next day all excited about how she had gone out to dinner with her husband and was able to eat—in the world of Italians, that is priority number one! All kidding aside, it was great to use the amazing technology and Atlantis workflow to tackle a challenging case and help the patient regain function. Impressions would have been very difficult, but with Primescan it was unbelievably easy. The patient was so excited that she wanted to start addressing the other areas as well—fun times in dentistry for sure!

about



Dr Anthony Ponzio is a 2004 graduate of the University of Illinois at Chicago College of Dentistry in the US. He currently maintains a private practice in Oak Park in Illinois with a special focus on technology in dentistry. Dr Ponzio is a CEREC basic and advanced trainer in the Midwestern US and has presented courses on

integrating CBCT and CEREC CAD/CAM technology to place and restore implants predictably and successfully. He serves as visiting faculty at Spear Education in Scottsdale in Arizona in the US and spent seven years on the clinical faculty at the Midwestern University College of Dental Medicine-Arizona, where he helped integrate CEREC CAD/CAM technology into the curriculum. Dr Ponzio has lectured throughout North America, training hundreds of dentists and their team members on how to effectively integrate CEREC CAD/CAM technology into their offices, delivering a vastly improved patient experience and a more productive dental practice.

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A CEREC zirconia single crown in 82 minutes

Dr Todd Ehrlich, USA



1



2



3

Fig. 1: Initial situation: large carious lesion on the distal surface of tooth #16, which had a 16-year-old onlay. **Fig. 2:** Scanning and creating the model. **Fig. 3:** Proposal for the definitive restoration.

Case presentation

A 58-year-old male patient came into our practice with a large carious lesion on the distal surface of tooth #16 (Fig. 1). The tooth had been restored with a CEREC onlay

in 2003 with a ceramic. It was doing well, but the lesion was large enough that a new restoration was indicated for the entire tooth. The large buccal abfraction was also a concern for the patient, so he wanted that covered as well. While waiting for the anaesthetic to take effect, much of the digital work could be completed. With CEREC Prime-scan and CEREC Primemill (both Dentsply Sirona), it is now possible to complete two workflow steps simultaneously (Fig. 2). After scanning and creating the model, the margin was marked and approved, and the proposal was completed. The CEREC software analysed the adjacent teeth to find the best anatomical shape to fit the patient. The milling strategies were calculated, and the proposal

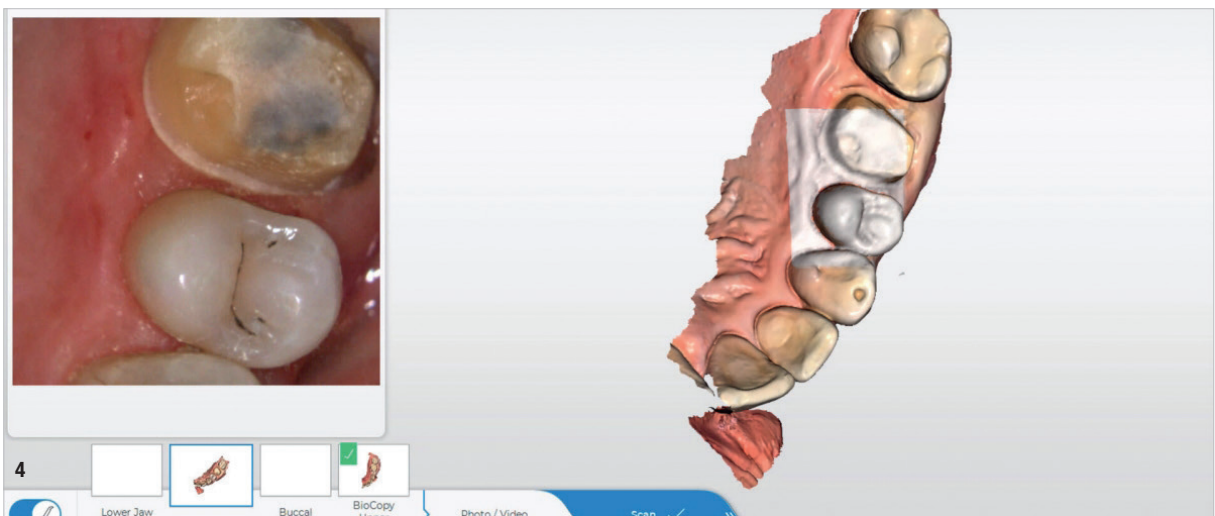


Fig. 4: Proposal for the definitive restoration, buccal view.

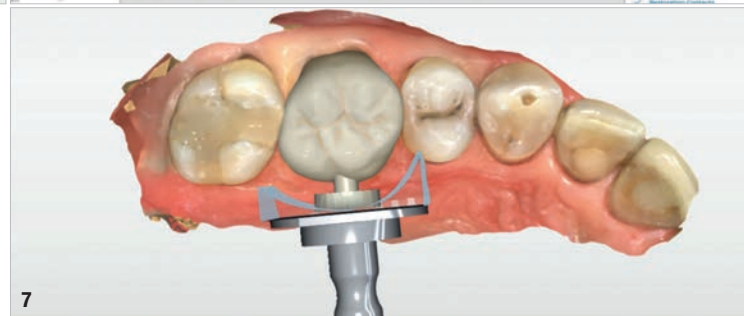
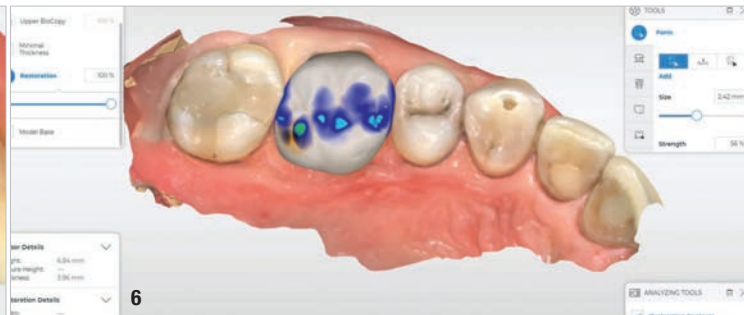


Fig. 5: Proposal for the definitive restoration displayed as it would be milled. **Figs. 6 & 7:** Milling process. The entire milling time was 4.22 minutes.

was displayed as it would be milled (Figs. 3–5). The design for the molar was sent to CEREC Primemill, where the CEREC Zirconia block (Dentsply Sirona) and the milling burs were ready to make a crown come to life. The entire time for milling was 4.22 minutes (Figs. 6 & 7). Zirconia can be milled in super-fast mode, resulting in milling that takes less than 5 minutes, reducing the overall process by approximately 10–15 minutes. Because CEREC Primemill and CEREC SpeedFire (Dentsply Sirona) are seamlessly connected, the sintering cycle is automated and made very efficient. Standard sintering times can be as short as 18 minutes, depending on materials and proposal design. The manufactured restoration was easily cemented with a resin-modified glass ionomer (Figs. 8 & 9).

because CEREC supports you in producing predictable outcomes with regard to the anatomy, interproximal contact and occlusion. The advancing technologies in zirconia are bringing out better aesthetics with every generation. The design of the restoration enabled the restoration to fit interproximally and occlusally without any adjustment.

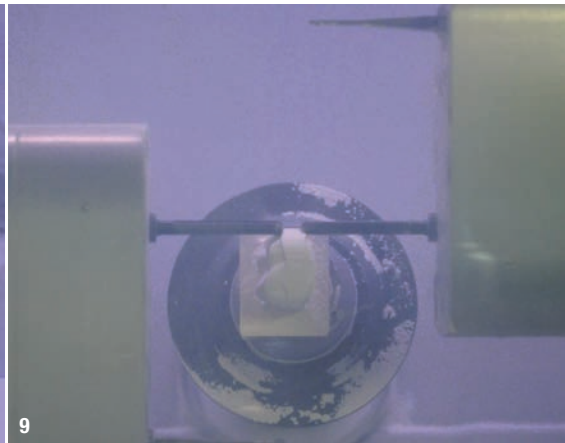
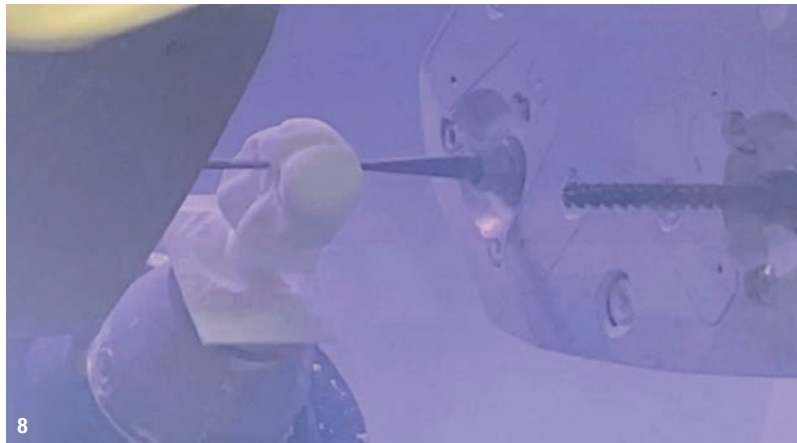


Fig. 8: Final result: highly aesthetic complete zirconia crown. **Fig. 9:** Buccal view of the definitive restoration.

The total treatment time was 1.22 hours, including preparation of the tooth and fabrication of the restoration.

Conclusion

The CEREC chairside system has always been known for its speed in delivering a restoration. In this particular case of a single unit, it requires usually just seconds to image the preparation. After imaging, the biogeneric proposal takes about 15 seconds. The clinician may do minor adjustments and changes of occlusion at his or her discretion. Finally, at the point of cementation, the clinical procedure is fast

about



Dr Todd Ehrlich has practised in the area of Austin in Texas in the US since 1998. He attended the University of Texas Health Science Center at San Antonio School of Dentistry, where he graduated *magna cum laude*. Dr Ehrlich is a consultant and lecturer on the state-of-the-art technology in dentistry. His training courses

are well known in the dental CAD/CAM world.

Fraunhofer developing 3D-printing technologies for medical applications

By Jeremy Booth, Dental Tribune International



Scientists in Germany and Poland are collaborating on the project Additive Technologies for Medicine and Health and the first results are expected later this year. (All images: © Christoph Wilsnack/Fraunhofer IWS)

Much has been made of the transformative potential of additive manufacturing in the medical field, and a project by the Fraunhofer-Gesellschaft hopes to pair new 3D-printing technologies with tangible applications in the medical sector. Scientists in Germany and Poland are collaborating on a series of pilot projects in selected medical fields, including dentistry.

The application-oriented research organisation announced in June that a German–Polish Fraunhofer-Gesellschaft High-Performance Center was engaged in the project Additive Technologies for Medicine and Health (ATeM). The first demonstrations of the individual projects are expected by the third quarter of this year.

In the dental field, Fraunhofer scientists are investigating new areas of application for the 3D printing of dental prosthetics.

“There is great potential in the use of innovative materials and the integration of additional functionalities in dental prostheses to increase the wearing comfort for the patient,” Prof. Frank Brückner, technology field manager for additive manufacturing and printing at the Fraunhofer Institute for Material and Beam Technology IWS, based in Dresden, commented in a press release.

The organisation mentioned some of the materials and applications that are being investigated in the dental field, stating that advancements in additive manufacturing could allow for faster treatment and significantly more complex dental implants to be printed immediately after the oral cavity is scanned using an intra-oral scanner. “Additive processes could also be used, for example, to combine metal and plastic materials for improved aesthetics,” Fraunhofer IWS said.



“There is great potential in the use of innovative materials and the integration of additional functionalities in dental prostheses” —
Prof. Frank Brückner,
Fraunhofer IWS

Fraunhofer IWS says that additive manufacturing could shorten lead times in the production of orthodontic distractors and enable an individualised fit for the patient.

The institute pointed to orthodontics, stating that additive manufacturing could enable treatment time to be reduced and brackets to be individualised for patients. The production of dental prostheses could also be made faster and more efficient, both in terms of treatment costs and resources, by using additive manufacturing technologies, it said.

“Additive technologies offer interesting opportunities, particularly for manufacturers in the medical technology sector,” Fraunhofer IWS explained. It commented that 3D printing allows individual solutions to be tailored to the patient and that additive technologies could help to integrate new and improved properties and functionalities into components. “This is usually not only more cost-effective than conventional processes but also allows to provide novel therapies and treatment approaches,” it added.

Dentists are showing high interest in intra-oral scanners and 3D printing for dental applications, and both of these fields are expected to show double-digit growth in the next five years. Dr Kamran Zamanian, a market researcher in specialist dental applications and founding partner of iData Research, commented in June that the technologies are increasingly attractive to dentists

owing not only to the seamless workflows that they offer in the practice but also to their ability to better control the risk of infection. In an editorial published by Dental Tribune International, Zamanian said that the COVID-19 pandemic had already influenced the market for dental 3D-printing technologies. “[Sales] of 3D printers are increasing rapidly now that the pandemic is getting closer to being stabilised. In addition, digital technologies, such as 3D printers and intra-oral scanners, offer better control of contamination risk, and this has already started to drive sales and will continue to do so in the near future,” he wrote.

The ATeM High-Performance Center was founded in 2021 and aims to incorporate additive manufacturing as an established tool in the field of medical technology.

The project is a collaboration between the Fraunhofer Institute for Material and Beam Technology IWS in Dresden, the Fraunhofer Institute for Machine Tools and Forming Technology IWU in Chemnitz in Germany, and the Faculty of Mechanical Engineering and the Center for Advanced Manufacturing Technologies at Wroclaw University of Science and Technology in Wroclaw in Poland.



The Additive Technologies for Medicine and Health project wants to digitise the production of dental prostheses in order to make it faster, cheaper and more efficient.

“One must take advantage of cutting-edge technology”

An interview with Dr Dalia El-Bokle, a specialist orthodontist from Egypt

By Monique Mehler, Dental Tribune International

There is no way around it: digitalisation is inevitable in all aspects of life, including, of course, in dentistry. Dr Dalia El-Bokle, a specialist orthodontist from Egypt, is well aware of this fact. At the 2021 UAE International Dental Conference and Arab Dental Exhibition, she presented a lecture on how to introduce digital tools into the orthodontic practice and why it is important to do so.

Dr El-Bokle, you presented a lecture titled “How ‘going digital’ can be a game changer in your orthodontic practice”. Can you explain in more detail what this covered?

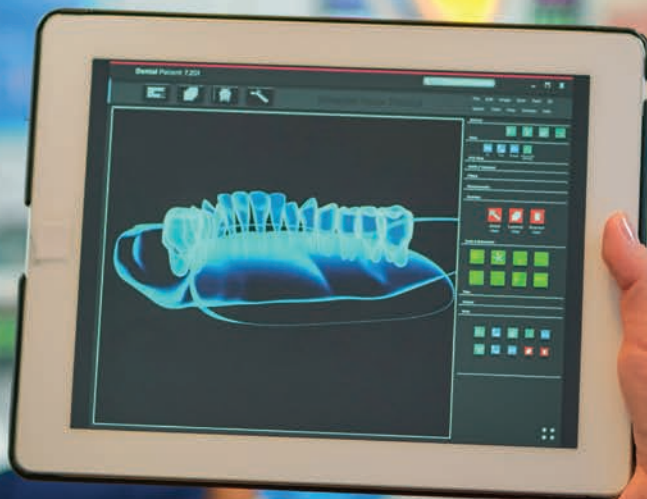
My lecture was about the advantages of applying digital technology in daily orthodontic practice, starting with intra-oral scanning to acquire digital models, followed by a full analysis of digital data to achieve an accurate orthodontic diagnosis. My lecture demonstrated how various digital treatment simulations and digital smile designs can easily be made and compared in order to select the most appropriate treatment plan. I also showed how I use these digital simulations and smile designs to educate,

“Going digital can be a great investment but also it can be a practice builder and promoter.”

engage and motivate my patients. This is very important for a successful result.

What would you tell people who are sceptical of implementing digital solutions in orthodontics?

Going digital can be a great investment, as it not only can increase one’s efficiency in orthodontic diagnosis and treatment planning, but also can be a practice builder and promoter. One must take advantage of cutting-edge technology such as scanners and various software in order to facilitate orthodontic diagnosis, reduce





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cross-contamination and achieve high-quality treatment outcomes. Going digital can be beneficial during treatment when using virtual indirect bonding for accurate orthodontic bracket positioning as well as when making in-house aligners. The result is an improved treatment outcome, with reduced time and laboratory fees.

Why did you choose orthodontics as your specialty, and why is working digitally in this field important?

I chose orthodontics because I think it's a unique dental specialty. It is challenging, as no one case is like another, and fulfilling, as one watches patients smile happily with more self-confidence at the end of treatment. The extended treatment time, compared with other dental specialties, also allows for a strong bond between me and my patients.

If you compare working as an orthodontist now with the situation when you started your career, what do you regard as the greatest developments that have taken place?

Oh, there have been many changes. First off, I now use an intra-oral scanner for my dental impressions, so it is less messy and more comfortable for my patients. A great amount of time has been saved and much frustration has been avoided, as my staff members no longer have to pour, trim or store dental models. Digital analysis of dental models nowadays is far more accurate than the old manual method, since one can magnify

“Digital analysis of dental models nowadays is far more accurate than the old manual method.”

the teeth virtually on a computer screen to examine and measure. I use special software that combines patients' digital models, photographs and radiographs to help me customise my treatment plans and to allow for patient involvement during decision-making.

about



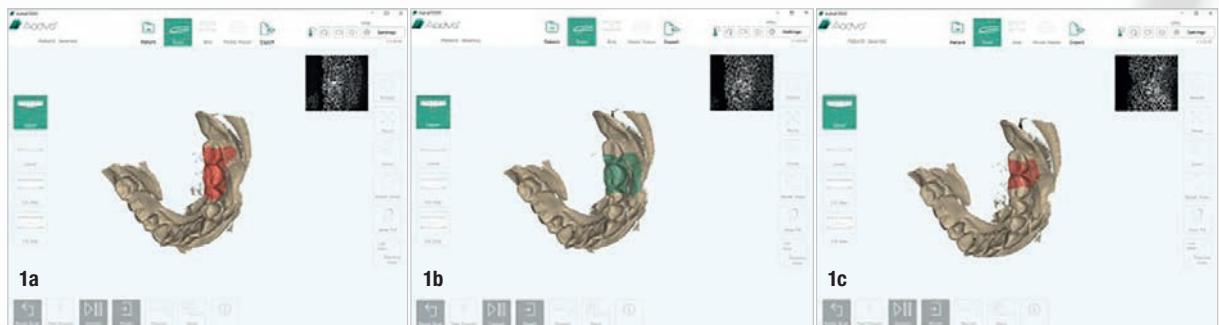
Dr Dalia El-Bokle, BDS, MSc, PhD, received her certificate of orthodontic training from Augusta University in the US and is a diplomate of the American Board of Orthodontics. She was formerly professor of orthodontics at Cairo University in Egypt and runs a private practice in Giza in Egypt. She is a member

of the Egyptian Orthodontic Society, American Association of Orthodontists and World Federation of Orthodontists.

The digital workflow in present-day orthodontics

An interview with Dr Marc Geserick, Germany

By GC Europe



Figs. 1a–c: Distance indicators: too far (large red square; **a**); ideal distance (green; **b**); too close (small red square; **c**).

The use of intra-oral scanners is becoming more common in orthodontics. However, the integration of or full transition from a conventional to a digital workflow can be difficult for some dentists. In this interview, Dr Marc Geserick explains how he uses the Aadvia IOS 100 (GC) orthodontics workflow in his daily work.

Dr Geserick, you have been practising for about 20 years. For how long have you worked with a digital workflow?

In 2011, the whole practice stepped into the digital workflow, and since then we have already done over 4,000 cases. Initially, we started with the Lythos scanner (Ormco), and currently we also have the option of working with the portable 3Shape scanner in a partner office. But the Aadvia IOS 100 with the developed workflow outperforms both systems. We have been using the Aadvia IOS 100 since 2018 and have already scanned over 500 cases.

How do you rate the extensive orthodontic workflow in the Aadvia IOS 100? Do you see it as an added value?

I consider the orthodontic workflow in the Aadvia IOS 100 to be very versatile. Scanning the upper or lower jaw has become very easy with the distance indicators on the screen (red for close or far and green for ideal distance). The centric relation and centric occlusion bites can be scanned in a few seconds by scanning either the left side or right side. Also, the Intelliscan feature facilitates scanning of soft tissue and makes the scan pickup a lot easier. We scan with few interruptions and high precision, making the planning of cases a lot easier.

The software allows me to effectively plan my cases thanks to the different tools it offers throughout the process. After I have performed the upper, lower and bite scans, the software combines them to create a virtual

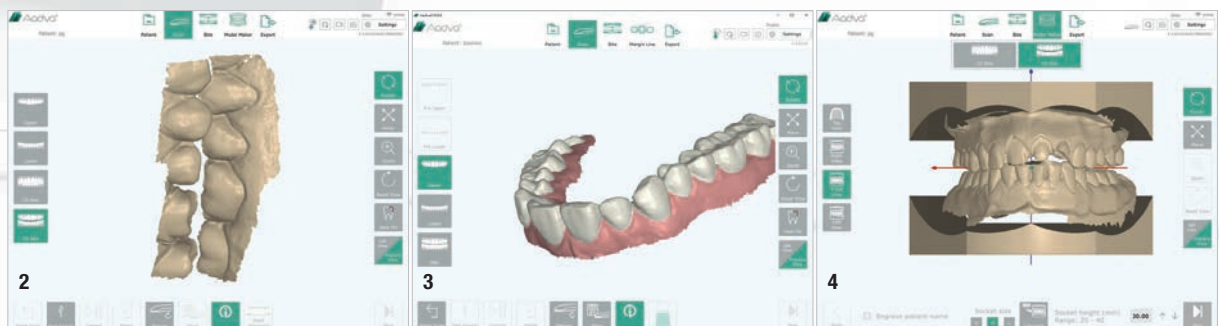


Fig. 2: View of the bite scan. **Fig. 3:** Scan done with the Intelliscan feature for soft-tissue scanning. **Fig. 4:** Model Maker with hollow American cut for optimal 3D printing.

model providing me with a complete view of the mouth. In the virtual model created by the Model Maker feature, I can see the jaws using different view options and adjust them to make sure that everything is aligned and centred. Additionally, before finalising, I am able to download and print a PDF document with the images of the model, giving me the necessary tools to plan my cases.

How has the Aadvia IOS 100 benefited your daily workflow compared with your conventional workflow?

The Aadvia IOS 100 has allowed me to enjoy a greater work-life balance. I have been able to reduce my work week to less than four days, allowing me to spend more time with my family. We don't have to store gypsum models (with a few exceptions), and our administrative workload is reduced because when we do *in vivo* scans, we now have different options for sharing the cases with the lab. Also, we can keep patients' information synchronised with our patient management software.

With the Aadvia IOS 100, I am able to scan a full arch in less than 3 minutes. But the combination of features I found in it are what attracted me the most. As mentioned before, I have worked with the Aadvia IOS 100 since 2018 and have already scanned over 500 patients, scanning an average of ten patients per day. I see Aadvia IOS 100 as a reliable entry-level scanner with an attractive price tag.

From which features of the Aadvia IOS 100 have you benefited the most? How and why?

The overall performance of the newly created workflow lends great support in the daily clinical routine. The biggest benefit is the PDF creator in the case of the treatment planning and marketing.

Planning has become very simple with model analysis and creation of tooth motion.

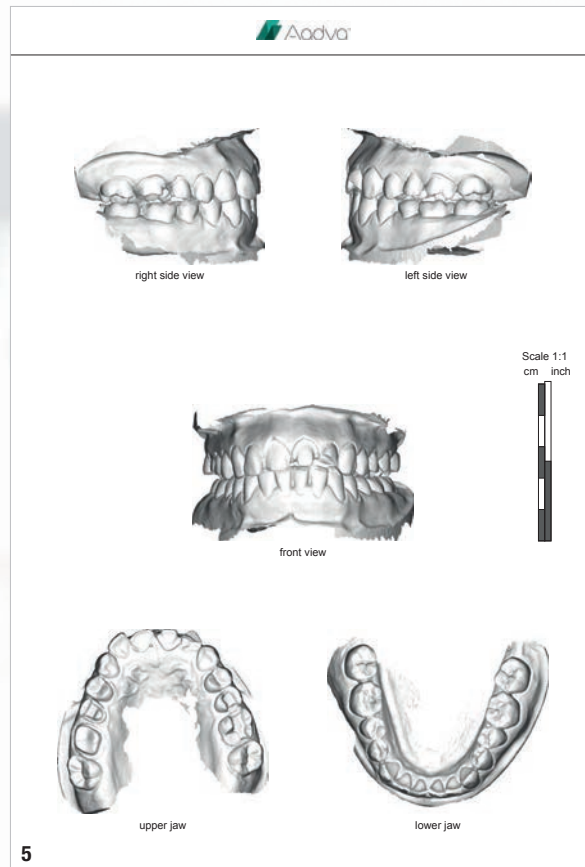


Fig.5: Example of PDF document for treatment planning.

Do you like the handpiece?

The Aadvia IOS 100 has one of the lightest and smallest handpieces on the market, which makes it easy to use. However, in some cases, we have noticed that the head of the handpiece is a bit wide for patients with small mouths (such as children). To work around this, we are able to combine conventional impressions with the *in vivo* bite scan.



6a



6b

Figs. 6a & b: Lightweight, ergonomic Aadvia IOS 100 handpiece for easy handling.



7

Fig. 7: AadvXchange (screen view). Fig. 8: Aadv IOS 100 P.

3D model printing. Manufacturing of orthodontic devices is outsourced to an external aligner company and digital orthodontic labs.

Besides the Aadv IOS 100, GC Europe offers a portable version, the Aadv IOS 100 P. It has the same features as the Aadv IOS 100, but consists of a laptop and the Aadv IOS 100 handpiece. This option provides high flexibility to dentists who work at multiple locations, as it can easily be transported between offices. Additionally, GC is continually enhancing the software used with the intra-oral scanner to keep ensuring that the customer experiences a smooth workflow.



8

Can you tell us more about this particular process, combining impressions with the *in vivo* scan?

We begin by taking a conventional impression with alginate, and we scan the impression along with the intra-oral bite of the patient. This is a time-saver because we don't have to make a gypsum model, and we proceed a lot faster in the planning phase where there is limited access to the patient's mouth.

How do you store the scan files and patient data?

We are a gypsum-free practice, and we can save our scan files on a USB stick, our network or the AadvXchange cloud service. The scans that are stored in the AadvXchange cloud can be stored for an unlimited duration, and we can extract the data wherever, however and whenever we want. This allows my lab to access the cases without inconvenience and maintain fluent communication between both parties.

What other digital solutions are you using in your daily practice?

about



Dr Marc Geserick his dental degree in 2000 from Ulm University in Germany and finished his training in orthodontics at the University of Basel in Switzerland in 2004. From 2013 to 2015, he completed an LLM (MedR) in Dresden in Germany. He actively participates in continuing education and has completed the Bioesthetic

Dentistry Level I and II courses and a two-year Roth/Williams postgraduate course. Since 2005, he has had his own private practice in Ulm. In 2007–2008, he was a visiting professor at the Grigore T. Popa University of Medicine and Pharmacy in Iași in Romania, and he has worked abroad at various universities in Sri Lanka, Japan and California in the US. He was involved in the development of the Bite Jumping Screw (FORESTADENT).

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Digital impression taking in modern dentistry

An interview with Dr Pawel Szuba-Paszkiwicz, Poland

By Iveta Ramonaite, Dental Tribune International

In a recent webinar focused on dental impressions in modern dentistry, Dr Pawel Szuba-Paszkiwicz, a dentist with a deep interest in digital prosthodontics, discussed the benefits and shortcomings of both traditional and digital impression taking. In this interview he presents some of the most common mistakes in dental impression taking and gives dental professionals advice on how to get around some of the limitations of dental scanners.



Dr Pawel Szuba-Paszkiwicz. (Image: © Pawel Szuba-Paszkiwicz)

Dr Szuba-Paszkiwicz, what are some of the most common errors that dental professionals make when taking traditional dental impressions?

The most common errors are inadequacies in the surface mapping of the impression materials, including air bubbles, delaminated layers between wash and body material, and shrinkage or extension of the material. Discomfort can be caused for the patient, including the triggering of the gagging effect when there is too much

material on the tray. Since there is only one approach for traditional impression taking, no corrections can be made after the impression has been taken.

Taking digital impressions is said to be faster and more precise than taking traditional impressions. However, despite their perceived benefits, digital scanners come with some limitations. Could you name a few, and give dental professionals advice on how to overcome them?

The limitations are most visible when scanning highly reflective surfaces or when there is high mobility tissue. This is most common when scanning edentulous ridges, especially in the mandibular region. Full-arch implant cases are difficult to achieve with sufficient accuracy and precision. However, there are some tricks that help immobilise the tissues, and it is also possible to scan by quadrants. Dental professionals can place some immobile composite or miniature screws onto the tissue to set reference points for the scanner. Alternatively, owing to its ultra-precise passivity for restorations, dental professionals could use a photogrammetric scanner for full-arch implant cases.

In your opinion, in which cases would it be more appropriate to take analogue impressions and why?

Analogue impression taking is more appropriate in cases where there is insufficient fixed pink tissue or edentulous ridge and when the scanner cannot match the surfaces together to achieve a precise 3D image. Long-span implant bridges with more than three implants should also be taken by analogue impression.

Editorial note: The webinar, titled Digital impression in modern dentistry: The possibilities and limitations of actual procedures. Facing the challenges is available to be viewed on demand on the FDI Oral Health Campus (www.fdioralhealthcampus.org).

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Virtual platform AG.Live

Freedom, more efficient processes and greater customer proximity

Amann Girrbach is all about supporting laboratories in the organisation of digital dental workflows. With the AG.Live digital platform, this project reaches a new dimension. AG.Live helps dental technicians to manage all digital activities locally and to connect with an ever-expanding global network of digital dental professionals.

Patient case management is at the core of the platform, which replaces the previous C3 customer portal. This is where the patient case is created, managed and processed digitally. Patient cases can be shared with partner laboratories for further processing and will, in the foreseeable future, also be exchanged between the dentist and the laboratory.

Not only will laboratories and clinicians be networked, but also machines and materials—in order to access material availability or, in the future, to access the operating modes of milling machines and many other relevant factors of a dental fabrication process.

Thus, AG.Live will enable the monitoring of all digital activities—from one place or from anywhere, and at any time. In doing so, it is Amann Girrbach's intention to create a network of optimised existing partnerships as well as new ones. Network participants will be

able to work and collaborate more efficiently and to focus on their strengths and thus better position themselves in the market.

This management portal, which is unique on the market in terms of scope, breaks down the linearity of dental restoration processes. Cross-linking into patient cases is now possible in a simple and straightforward manner by making patient data centrally accessible and editable. The linking of previously separate data sources creates synergistic effects from which AG.Live users can profit sustainably and gain a noticeable competitive advantage.

In a further step, Amann Girrbach will implement access to the company's own Amann Girrbach Academy training portal with numerous training and further education opportunities as well as an extensive archive of webinars and tutorials.

Free online presentation about AG.Live: 360-degree service for your digital infrastructure

Digitisation has fundamentally changed dental technology in the last ten years. The digital fabrication of dentures has become the standard in dental laboratories. In his exciting presentation recorded at the AG.Live CON at the end of April, Christian Ermer, chief marketing officer at Amann Girrbach and responsible for the company's digital transformation, explains how the newly developed AG.Live platform from Amann Girrbach is now taking digital dental technology to a new level and enabling seamlessly integrated and interdisciplinary collaboration.

The full presentation is available free of charge in various languages at <https://bit.ly/3uYJlQ4>.



DIGITAL CASE MANAGEMENT



CONNECTIVITY



CONSUMABLES / LABORATORY INFRASTRUCTURE MANAGEMENT



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BioHorizons Camlog

The next generation soft-tissue augmentation material

When choosing a biomaterial, there is a strong demand in clinical practice for predictable outcomes. For over 20 years, LifeCell, a leading global medical technology company, has developed innovative products for use in a wide range of applications. BioHorizons Camlog expands its soft-tissue portfolio to bring NovoMatrix, an innovative soft-tissue augmentation material. NovoMatrix is an acellular extracellular dermal matrix consisting of tissue-engineered porcine material. It is a breakthrough in xenogeneic processing

ensuring a structurally intact, undamaged scaffold that supports cell and microvascular ingrowth. The proprietary tissue processing allows for rapid revascularisation, cell repopulation and minimal inflammation. NovoMatrix comes pre-hydrated and ready to use and offers a true alternative to autogenous soft-tissue grafts and current products on the market. The NovoMatrix indications include guided tissue regeneration procedures in recession defects for root coverage, localised gingival augmentation to increase keratinised tissue (KT) around implants and natural teeth, and alveolar ridge reconstruction for prosthetic treatment.



www.biohorizonscamlog.com

MIS Implant Technologies

New 16 mm drill kit for conical connection implant procedures

As part of the company's continuing effort to offer comprehensive solutions for guided surgery procedures in all clinical scenarios, this spring, MIS released their new MGUIDE kit for 16 mm conical connection drills used in implant placement procedures. The new kit has already been implemented in MSOFT, the MIS software used for guided procedure planning, and is offered through an automatic update. This new offering extends the existing solution for this range of implant lengths that were not previously available. The kit includes all drills for a complete procedure, as well as the addition of a marking drill which is intended for extraction sites. Orit Kario, MIS Digital Solutions Product Manager, highlights the marking drill, explaining that "it was designed for this specific kit and enables drilling within sockets, providing an added value in immediate placement procedures within extraction sites. The drill's design allows to drill in through the socket wall. In addition, the same kit may be used for both standard and narrow sleeve drills.



www.mis-implants.com

MIS announces **new dates** for its **fifth global conference**

By MIS Implants Technologies

After the long-awaited announcement of the new dates for the fifth MIS Global Conference, the MIS team is hard at work getting ready for this global meeting. As major global events were affected by the COVID-19 pandemic, which led to uncertainty and rescheduling, the conference is now planned to be held from 19 to 22 May 2022 in Marrakech in Morocco and will include a three-

day scientific programme of lectures by world-renowned experts, hands-on workshops and exciting social events.

World-class speakers and experts in their fields

Like for previous global conferences, the scientific committee is determined to present the most relevant and important topics and cases as part of the scientific programme. Speakers have been carefully selected to share new concepts, breakthroughs and a view into their vast collective experience and knowledge.

Exotic views and spellbinding entertainment

With a location such as Marrakech, conference guests can count on being met with a rich pallet of beautiful and colourful sights, exotic tastes and smells, and unique experiences to be remembered. The meticulously planned and spectacular evening affairs, which characterise every MIS Global Conference, are sure to be part of this highly anticipated event.

Twenty-five years of making it simple

Last year, MIS Implants Technologies celebrated its 25th anniversary. During these two and a half decades, the company has taken on countless challenges, explored many developments and celebrated numerous breakthroughs. Today, MIS is an established global business and one of the major competitors in the dental implant market.

For further info and details, please visit the MIS website www.mis-implants.com.



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International events



IDS— International Dental Show

22–25 September 2021
(on-site and online event)
Cologne, Germany
www.ids-cologne.de



EAO Digital Days

14–16 October 2021 (online event)
Italy
www.eao.org/congress



FDI World Dental Congress

26–29 September 2021 (online event only)
Sydney, Australia
www.fdiworlddental.org/fdi-world-dental-congress



Dentex—International Dental Equipment Exhibition

21–23 October 2021
Brussels, Belgium
www.dentex.be/en



Dental-Expo

27–30 September 2021
Moscow, Russia
www.en.dental-expo.com/dental-expo-en



AAP Annual Meeting

4–7 November 2021
Miami, US
www.perio.org



CEDE—Central European Dental Exhibition

7–9 October 2021
Łódź, Poland
www.cede.pl/en



ADF—Conference and Exhibition

23–27 November 2021
Paris, France
www.adfcongres.com/en



31st Annual NYU/ICOI Implant Symposium

9–10 October 2021
New York, US
www.icoi.org/events



GNYDM

28 November–1 December 2021
New York, US
www.gnydm.com

How to send us your work



Please note that all the textual components of your submission must be combined into one MS Word document. Please do not submit multiple files for each of these items:

- the complete article;
- all the image (tables, charts, photographs, etc.) captions;
- the complete list of sources consulted and
- the author or contact information (biographical sketch, mailing address, e-mail address, etc.).

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Text length

Article lengths can vary greatly—from 1,500 to 5,500 words—depending on the subject matter. Our approach is that if you need more or fewer words to do the topic justice, then please make the article as long or as short as necessary.

We can run an unusually long article in multiple parts, but this usually entails a topic for which each part can stand alone because it contains so much information.

In short, we do not want to limit you in terms of article length, so please use the word count above as a general guideline and if you have specific questions, please do not hesitate to contact us.

Text formatting

We also ask that you forego any special formatting beyond the use of italics and boldface. If you would like to emphasise certain words within the text, please only use italics (do not use underlining or a larger font size). Boldface is reserved for article headers. Please do not use underlining.

Please use single spacing and make sure that the text is left justified. Please do not centre text on the page. Do not indent paragraphs, rather place a blank line between paragraphs. Please do not add tab stops.

Should you require a special layout, please let the word processing programme you are using help you do this formatting automatically. Similarly, should you need to make a list, or add footnotes or endnotes, please let the word processing programme do it for you automatically. There are menus in every programme that will enable you to do so. The fact is that no matter how carefully done, errors can creep in when you try to number footnotes yourself.

Any formatting contrary to stated above will require us to remove such formatting before layout, which is very time-consuming. Please consider this when formatting your document.

Image requirements

Please number images consecutively throughout the article by using a new number for each image. If it is imperative that certain images are grouped together, then use lowercase letters to designate these in a group (for example, 2a, 2b, 2c).

Please place image references in your article wherever they are appropriate, whether in the middle or at the end of a sentence. If you do not directly refer to the image, place the reference at the end of the sentence to which it relates enclosed within brackets and before the period.

In addition, please note:

- We require images in TIF or JPEG format.
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Larger image files are always better, and those approximately the size of 1 MB are best. Thus, do not size large image files down to meet our requirements but send us the largest files available. (The larger the starting image is in terms of bytes, the more leeway the designer has for resizing the image in order to fill up more space should there be room available.)

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You may submit images via e-mail or share the files in our cloud storage (please contact us for the link).

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Questions?

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digital

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Explore more at [3Shape.com](https://www.3shape.com)

1. A Look at Infection Prevention in Dental Settings (Barengil, et al. 2019).

2. 80% of studies (4 of 5) show patients choose digital impressions over conventional (Chandran et al. 2019).

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