Ivoclar Vivadent hosts successful Competence in Esthetics symposium

By DTI

VIENNA, Austria: Digitalisation has changed the dental industry and new technologies have entered dental practices and laboratories faster than predicted. Following the dynamics of this development, dental manufacturer Ivoclar Vivadent highlighted this topic at its Competence in Esthetics symposium recently held in the Austrian capital of Vienna.

For the third time, Ger- not Schuller, Senior Direc- tor for Austria and Eastern Europe at Ivoclar Vivadent, and his team succeed in drawing participants from all over the world to the symposium. More than 2,000 participants from 36 countries registered for the event, which is traditionally hosted at the Austria Center Vienna conference venue. An additional 1,000 people joined as day visitors to attend the presentations of the 21 speakers.

In his opening speech, Ivoclar Vivadent CEO Robert Ganley explained why it is important for the company to focus on digitalisation, a megatrend that has been predicted by reputable futurolo- gists and not only for dentistry.

Many speakers at the symposium were pioneers in terms of digitalisation and have used several generations of devices and technologies and shared their experiences via numerous clinical cases that they treated using either a fully or mixed digital approach.

What changed with the advent of CAD/CAM? What are the strengths and weaknesses of this technology? At the event, there was a general consensus that CAD/CAM is an intelligent tool rather than a solution in itself. That CAD/ CAM facilitates day-to-day work and makes it easier for dentists and dental technicians to overcome the barriers of time and space was proven by a number of presenters who work as a team across different countries, among them Dr Ste- fan Kouli from France and dental technician Hilal Koubi from Tur- key, as well as Dr Florin Cofar from Romania and dental technician Lorant Stumpf from Ireland.

At the symposium, new state-of-the-art software was introduced that in the future will allow users to see different versions of their restoration in a virtual mirror and modify it with a swinging motion, like on a smartphone. A demo version of the program is already available and was shown at the event.

At present, treatment teams may use mock-ups that are milled or printed to give their patients a clearer sense of what their prospective smiles may look like. Dr Irena Sailer and dental tech- nician Vincent Feher presented a case in which they offered their patient three different mock-ups to try in: a perfect aesthetic version, a version with a diastema and another one in which teeth #12 and 22 were rotated around their axes. These digitally prepared mock-ups facilitated the conversation with the patient and made it possible for her to choose her own prospective smile. The mock-up of her choice was then finalised using digital technology. “This is as easy as copy and paste,” said Feher.

Dental technicians can expand their digital library with every clinical case by storing scan data. Over time, this results in an extensive col- lection of tooth shapes that can be used in the planning of other cases. The Cofar–Stumpf team knows how to use the library to their advantage. Both team members have studied the dentition of many patients and have turned the basics of aesthetics upside down when it comes to shape and symmetry: their result proves that the shape of the face does not always conform to the shape of the tooth and some asymmetry may be present—especially in the case of smiles that appear natural or beauti- ful. “It’s all about harmony and indi- viduality and not about perfection in form and symmetry,” explained Cofar. When the team members use their library of nature in the digital planning process, they blend the anterior and posterior teeth of differ- ent cases. In the process, the teeth are scaled in size but never distorted, because that would affect the optical result adversely.

Especially for Ivoclar Vivadent events and lectures, the company developed the IV Events app. Dur- ing the Competence in Esthetics 2017 symposium, the app provided information about the presenta- tions and speakers, and allowed users to rate them using the star system used on social media. The app also gave participants the op- portunity to pose questions to the presenters, and questions of broad interest were discussed on stage. The discussions were moderated by Dr Thomas Bernhart (scient- ific chairman of this year’s event) and Laurent Schencel (Senior Di- rector of Global Communications and Strategy at Ivoclar Vivadent).

Digitalisation in focus. New state-of-the-art software was introduced at the event.

US dental software provider first to deliver voice-assisted ordering

By DTI

NEW YORK, USA: The next step in artificial intelligence advance- ment within dentistry could be just around the corner. Awrel, the dental software solution provider for web, mobile and voice plat- forms, has recently unveiled their Awrel Partner Portal. According to the company, this new technology enables dental supply companies and laboratories to supply their customers with intelligent, voice- guided ordering services for im- plants, supplies and equipment.

The capabilities of the new technology reportedly enable com- panies to extend their order pro- cessing capabilities beyond the cur- rent paper- and mobile-based methods to environments that deliver next-generation, conversa- tional voice experiences. Addition- ally, companies will be able to cust- om label their offerings, define unique workflows and create com- pany- and product-specific conver- sational exchanges.

“We’re very pleased to be the first dental software provider to deliver voice-assisted, hands-free ordering,” said Dr Arnold Rosen, Awrel founder and CEO. “With this technology, dental care providers will see improved productivity and quality while suppliers and labs will accelerate their sales pro- cesses. This is a definite win-win.”

The system is designed so that the person placing the order can respond to product-specific prompts from a voice-powered agent or chatbot. Each subse- quent interaction follows an intel- ligent, protocol-based conver- sational flow. After the order is completed, it can be sent via message to the supplier or labo- ratory, or the system can be cus- tomised so that it can flow di- rectly into an existing electronic ordering system.

“We soon realise that den- tistry could logically benefit from next-gen voice assistants. This is a logical extension of our offerings,” said Rosen. “As a prosthodontist, my hands serve as the tools of my trade. I’d rather they be working to create a great smile than typing orders into a computer or cellphone. With voice technology, my hands are free to work and puts my focus where it belongs—on the pa- tient.”

Companies using Awrel’s voice capa- bilities can also provide their customers with Awrel’s ready- to-download text- ing and collabora- tion tool for HIPAA-com- pliant sharing and the stor- age of messages, images, docu- ments and scans.
Stay CALM! Planmeca algorithm improves imaging quality

By DTI

HELSINKI, Finland: Patient movement is among the most significant challenges to CBCT imaging, producing artefacts that can compromise the quality of the image. According to Finnish manufacturer Planmeca, an end-user solution to this problem was in the company’s sights for some time and has now finally been addressed with Planmeca CALM.

The algorithm analyses and compensates for patients’ movement, eliminating the need for re-takes and thus improving the quality of and the time needed for imaging in dentistry. Recounting the development process of CALM (Correction Algorithm for Latent Movement), Planmeca 3-D imaging specialist Mikko Lilja explained the mechanism of the solution. “In tomographic reconstruction, the assumption is that the measurements—in this case the CBCT x-ray projection images—are geometrically consistent with one another, but when a patient moves, the data no longer adds up, which shows in the reconstruction.”

To avoid these disruptions, Planmeca CALM restored the consistency of the X-ray measurements by tracking the movement of the patient. The algorithm works with all volume and voxel sizes and adds only between 10 and 60 seconds to the overall reconstruction time, the company stated. The function can be run either after the scan is complete or before exposure to ensure that the volumes are already corrected before they are accessed in the Planmeca Romexis software.

“In the past, dentists would send their unsatisfactory images to the manufacturer for reconstruction or just redo the entire scan, but with Planmeca CALM this is now a thing of the past. We are proud to be the first dental manufacturer to provide a solution for motion artefact correction to the end-user,” Lilja said.

For dentists, the CALM feature is especially valuable when imaging restless or livelier patients, such as children, individuals with special needs or elderly patients. “Even in cases where you might not typically think there has been significant movement, Planmeca CALM can noticeably enhance the image and enable seeing more details,” Lilja concluded.

Western Australia to change restrictive CBCT ownership regulations for dentists

By DTI

PERTH, Australia: CBCT imaging is changing the way dental practitioners can visualise the oral and maxillofacial complex, as well as teeth and the surrounding tissue. Despite being regarded as beneficial for practitioners and patients alike, owing to a restrictive licensing policy, the technology is only available to a minority of dental practitioners in Western Australia. However, this regulatory framework is set to change, according to the Australian Dental Industry Association (ADIA).

Although each state and territory takes a different regulatory approach to owning CBCT equipment, in terms of outcomes, there is broad alignment across all of them—with the exception of Western Australia.

“ADIA welcomes news that the Radiological Council of Western Australia looks set to remove the restrictions on CBCT ownership in that state,” said ADIA CEO Troy Williams. “Owning and operating CBCT equipment in Western Australia is currently limited to dentists registered with the Australian Health Practitioner Regulation Agency (AHPRA) in the specialty of dentomaxillofacial radiology—a criterion that only very few dentists fulfill. In a senate committee hearing on 9 November, the ADIA CEO pointed out that, of the about 1,780 registered dentists in the state, almost none satisfy the requirement to own and operate CBCT equipment.

Once in force, the regulatory changes will allow AHPRA-registered dentists who have successfully completed a recognised CBCT course to be eligible for a licence to own and operate CBCT equipment. According to the ADIA, the requisite courses are offered by the dental schools at the University of Queensland and the University of Adelaide and by a private provider.

“ADIA CEO pointed out that, of the about 1,780 registered dentists in the state, almost none satisfy the requirement to own and operate CBCT equipment.”

This outcome is entirely consistent with what ADIA has argued for over many years. It’s actually five years ago this month that ADIA met with the then Minister for Health to progress this reform and we’ve naturally discussed it in the past with the current Minister, Roger Cook,” Williams commented.

It has not yet been announced when the new legislation will be put into force.
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Fixed and removable implant restorations: A solution for every arch

By Dr Paresh B. Patel, US

Introduction

When a patient presents with an edentulous arch or terminal dentition, implant treatment can be provided that improves not only form and function, but also quality of life. For patients desiring better masticatory capability, stability, aesthetics and comfort than a conventional denture can offer, both removable and fixed implant restorations are superior alternatives. While the appropriate implant solution can vary depending on the patient’s oral health, anatomy, quality and quantity of bone, and financial resources, full-arch prostheses have progressed to the point where virtually every patient can have his or her teeth restored.

Although fixed implant-supported restorations offer the highest levels of stability, function and patient satisfaction, removable overdentures also offer a dramatic improvement over conventional complete dentures. Both treatment options effectively mitigate the bone resorption that occurs after the loss of teeth, helping to preserve the oral and facial structures and, by extension, the self-confidence of the fully edentulous patient.

Determining which solution is appropriate requires a careful evaluation of the individual patient’s circumstances and desires. Even when an implant overdenture is delivered, the prosthesis can eventually be converted to a fixed restoration. As evidenced by the case that follows, in which one arch is restored with an implant overdenture and the other with a Brux-Zir Full-Arch Implant Prosthesis, practitioners today have a great deal of clinical flexibility.

Whatever prosthetic approach is adopted, immediate, life-changing relief can be provided to patients suffering from terminal dentition or an uncomfortable, poorly functioning conventional denture.
Case presentation

A 47-year-old male presented with terminal dentition in both arches resulting from periodontal disease and severe caries (Figs. 12–14). The patient had already lost many of his teeth, and the dentition that remained had been rendered unstable by his periodontal condition (Fig. 2). He had saved up enough money for a fixed implant restoration for his upper arch, for which he desired the most functional, lifelike prosthesis possible. While he could not afford such a restoration for both arches, he wanted a retentive appliance for his mandible, with the option of later upgrading to a fixed prosthesis.

The patient accepted a treatment plan in which his maxilla would be restored with a BruxZir Full-Arch Implant Prosthesis and his mandible with an Inclusive Locator Implant Overdenture. Fabricating his maxillary restoration from monolithic zirconia would ensure maximum long-term durability. This was important considering the relatively young age of the patient, who would not have to worry about his maxillary prosthesis succumbing to fractures, chips or stains. His mandibular appliance would be held in place by Locator attachments (Zest Dental Solutions), which are an economical means of improving prosthetic retention and stability. The overdenture caps that connect to the Locator attachments would be incorporated in the prosthesis chairside—though it should be noted that many clinicians elect to have the laboratory handle this step.

The surgical phase of treatment called for the extraction of the patient’s remaining teeth, followed by the immediate placement of eight dental implants. Cone beam computed tomography (CBCT) scans were taken to help determine the optimal placement of the implants within the available bone and away from the patient’s vital oral anatomy. Evaluation of the CBCT scan determined that there was sufficient height, width and quality of bone to place the implants in the appropriate locations and angulations via freehand surgery. Four ø3.7 mm Inclusive Multi-Unit Abutments (Glidewell Direct) were attached to the maxillary implants, ensuring maximum long-term durability of the overdenture while affording the possibility of upgrading to a fixed restoration at a later time. After the creation of the osteotomies, the implants were placed (Figs. 13a & b).

Inclusive Multi-Unit Abutments (Glidewell Direct) were attached to the maxillary implants, correcting for the divergent angulation of the implants. This would both position the restorative platform in a manner that would situate the screw access holes of the eventual prosthesis toward the lingual aspect and allow for a molar–molar restoration (Fig. 3). Note that patients with terminal dentition presenting for treatment are commonly anxious about losing their teeth and the effect this will have.
on their speech and masticatory capabilities. For this reason, it is important to make every effort to ensure that the patient leaves with a functional appliance in place. Thus, conventional dentures were fabricated from preliminary impressions in advance of the surgical appointment for modification and delivery after placement of the implants (Fig. 6).

Sufficient primary stability having been achieved, the implant-loaded maxillary and mandibular wax set-ups were tried in to evaluate fit, aesthetics, occlusion, and function. The appliance was modified at chairside to connect to the dental implants. The maxillary wax rim incorporated temporary cylinders so that the set-up could be attached to the implants during evaluation. The mandibular wax rim was designed to seat over Locator attachments. The implant verification jig was attached to the implants so that a provisional implant overdenture could be seated over Locator attachment analogues situated in the mandibular cast. This would allow the overdenture caps that engage the Locator attachments to be picked up chairside.

The provisional implant prosthesis was milled and seated on the master cast to verify proper fit, as well as the interocclusal relationship with the opposing implant overdenture (Figs. 14a & b). The maxillary and mandibular wax set-ups were tried in to evaluate fit, aesthetics, occlusion, and function. The individual sections of the implant verification jig were seated and luted together before being picked up in the open-tray final impression, which was made using a custom tray and Capture PVS material (Glidewell Direct) (Figs. 16a & b). The final mandibular implant overdenture was designed to seat over Locator attachment analogues situated in the mandibular cast. This would allow the overdenture caps that engage the Locator attachments to be picked up chairside.

The verified overdenture caps remained fixed, ensuring an extremely accurate final impression (Fig. 17). The approved wax set-ups and provisional implant prosthesis were milled and seated on the master cast to verify proper fit, as well as the interocclusal relationship with the opposing implant overdenture (Figs. 18a & b). The provisional implant prosthesis was milled and seated on the master cast to verify proper fit, as well as the interocclusal relationship with the opposing implant overdenture (Fig. 14a). This would aid the laboratory in designing an overdenture that fully rested on the tissue instead of the implants. The case was returned to the laboratory, and wax set-ups were produced (Figs. 15a–c). During the try-in appointment, the wax set-ups were evaluated to confirm the vertical dimension of occlusion, interocclusal relationship, phonetics, aesthetics, masticatory arrangement of the teeth, tooth colour and shape, incisal edges and function (Figs. 16a–c).

After final approval of the wax set-ups, the restorative protocols for the two prostheses diverged, as the laboratory moved directly to the definitive prosthetic design was accurate before milling the final restoration from monolithic zirconia. The implant verification jig was attached to the implants so that a precise final impression could be taken (Figs. 17a–c). The custom tray provided by the laboratory was filled with PVS material and seated over the implant verification jig. As the PVS material set, the relative positions of the implants represented by the verification jig remained fixed, ensuring an extremely accurate final impression.

The approved wax set-ups and final maxillary impression were returned to the laboratory so that the final mandibular implant overdenture and maxillary provisional implant prosthesis could be produced. The final mandibular appliance was fabricated on the master cast and included recess wells in which metal housings with overdenture caps would be cured chairside (Figs. 18a & b). These denture caps provide retention and stabilise the prosthesis.
The appropriate retentive overdenture caps were seated over the Locator attachments. — Fig. 24: Quick Up self-curing acrylic was used to pick up the metal housings in the overdenture and fill in the minor voids between the denture caps and recess wells of the prosthesis. Note that, in many cases, the dentist elects to have the overdenture caps processed by the laboratory — Fig. 25: The black processing inserts were replaced with the appropriate retentive caps, which are colour-coded according to strength — Fig. 26: The patient with the final Locator overdenture and the maxillary provisional implant prosthesis in place — Fig. 27: The definitive maxillary restoration was milled from BruxZir Solid Zirconia, incorporating the slight adjustments that were made to the PMMA provisional appliance — Figs. 28a & b: The final BruxZir Full-Arch implant prosthesis completed a dramatic oral reconstruction for a patient who presented with terminal dentition, restoring form, function and quality of life.

A new master cast of the maxilla was produced based on the custom open-tray final impression. The new master cast and final approved wax set-up were scanned. A virtual model was generated upon which the fixed monolithic prosthesis was designed using CAD software (Figs. 19a & b). Because this digital model was based on the final impression with the verification jig, screw access holes were created in precise alignment with the positions of the maxillary implants. The resulting design was used to mill a provisional implant prosthesis from polymethyl methacrylate (PMMA, Figs. 20a & b). This appliance was tried in and worn for a trial period, thus ensuring an accurate prosthetic design.

The provisional implant prosthesis is an essential element of the restorative process, as significant adjustments cannot be made to the final restoration once it has been milled from BruxZir Solid Zirconia. At the following appointment, the inclusive Locator Implant Overdenture was seated and checked for proper fit, function and support from the soft tissue. The provisional implant prosthesis was then screwed into place, and its tooth positioning, function and aesthetics were verified (Figs. 21a & b). With both appliances in place, the interocclusal relationship was checked (Figs. 22a & b). Minor occlusal adjustments were made directly to the maxillary provisional implant prosthesis, as PMMA is easily modified. Slight alterations were also made to the mandibular implant overdenture. Block-out shims and the retentive overdenture caps were then seated over the Locator attachments (Figs. 23a & b) Quick Up self-curing material (VOCO America) was added to the recess wells of the overdenture before seating the appliance over the metal housings. After allowing the material to set for approximately 3 minutes, the overdenture was removed, picking up the denture caps in the prosthesis. The minor voids surrounding the denture caps were then filled with Quick Up light-cured pink composite (Fig. 24). The appropriate retentive inserts, which are available in a variety of strengths, depending on the functional capabilities of the patient and the number of implants, were swapped into the metal housings (Fig. 25). The implant overdenture was reseated, providing excellent retention, stability and function for the patient.

With the final mandibular restoration in place, the patient wore the provisional full-arch implant prosthesis for a trial period of two weeks (Fig. 26). This opportunity to wear the appliance during actual daily-to-day function instilled a high degree of confidence in the prosthesis design for the patient and dentist alike. After patient approval, the provisional implant prosthesis was returned to the laboratory so that it could serve as the blueprint for the final restoration and the minor adjustments made to the appliance could be included in the definitive prosthetic design.

The final BruxZir Full-Arch Implant Prosthesis was digitally fabricated with precision (Fig. 27). As an exact reproduction of the test-driven provisional, the definitive prosthesis fitted perfectly and offered the aesthetics and functional capabilities of the patient who came to expect (Figs. 28a & b). The final restoration effectively addressed the unique circumstances of the case, providing the most durable, stable prosthetic possibility for his maxilla and mandibular restoration that greatly improved prosthetic retention and could be upgraded to a fixed prosthesis should the patient’s situation change.

Conclusion
Practitioners now have the clinical flexibility to offer patients a wide range of treatment options, from entry-level, economical restorations like the Inclusive Locator Implant Overdenture to the fixed, highly durable BruxZir Full-Arch Implant Prosthesis. There is a viable means of treating nearly all patients, whatever their oral health, needs and finances. Given the life-changing benefits of implant therapy and the straightforward restorative protocols of today, all patients should be offered this service to confront the challenges presented by complete edentulism.

Dr Paresh B. Patel is a co-founder of the American Academy of Small Diameter Implants and has worked as a lecturer and clinical consultant on dental implants for various companies. He has been in private practice in Lenoir and Mooresville in North Carolina since 1996 and can be contacted at pareshpateldds2@gmail.com.

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