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IDS reaffirms its leading position as global dental trade fair

See the latest innovations at the 14th CAD/CAM & Digital Dentistry Conference & Exhibition on 12-13 April 2019 in Dubai, UAE

By Dental Tribune International

COLOGNE, Germany: The International Dental Show (IDS), which took place in Cologne from 12 to 16 March, fulfilled the high expectations of the global industry and once again underlined its position as the leading trade fair. With 2,327 companies from 64 countries participating, this year's event welcomed 20 more exhibitors compared with two years ago, as well as 160,000 trade visitors from 166 countries. The overall number of visitors rose by 3.2 per cent (about 5,000 more people) and the number of foreign trade visitors by 6.0 per cent.

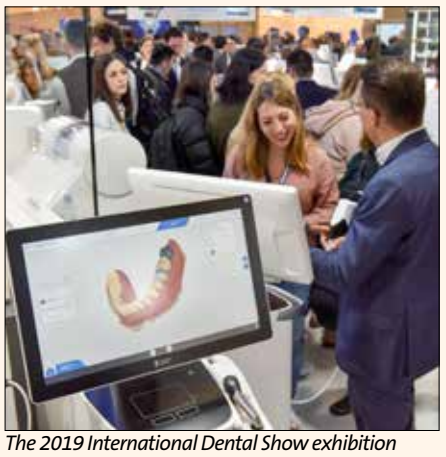
Gerald Böse, CEO of Koelnmesse, which stages the show, said: "IDS is a trade fair in a class of its own and always sets new benchmarks. It manages to surpass the already excellent results of the previous event every time." Both visitors and exhibitors are impressed by IDS: it is only here that one encounters supply and demand of such an extent, quality and level of internationality. "IDS is the undisputed leading global trade fair for the dental industry," he continued.

The 2019 International Dental Show exceeded the results of the previous event and the organisers attained their goals of greater internationality and higher quality in supply and demand, boosting the satisfaction of both exhibitors and attendees.

The official figures confirm the high level of internationality at IDS: 73 per cent of the exhibitors and 62 per cent of the visitors came from 166 foreign countries, including Argentina, Australia, Brazil, Canada, Chile, Egypt, Japan, Korea, New Zealand, South Africa and the US. Regarding the 6 per cent increase in foreign visitors, IDS 2019 recorded significant growth in the number of visitors from Asia (+23.1 per cent), eastern Europe (+19.6 per cent), Africa (+17.0 per cent), Central and South America (+14.6 per cent) and North America (+5.3 per cent) specifically.

An independent visitors' survey reported that the largest groups of visitors came from the dental industry. Schools and universities were strongly represented too. Almost 80 per cent of those who completed the survey stated they were satisfied or highly satisfied with the range of exhibition offerings. More than 93 per cent said that they would recommend visiting IDS, and 70 per cent of the respondents were already planning to visit the next IDS, in 2021.

Dr Markus Heibach, Executive Director of the Association of the German Dental Industry, which is involved in organising the event, was also pleased with the outcome of the trade fair:



The 2019 International Dental Show exhibition

"The high level of satisfaction of our trade visitors and exhibitors is for us impressive confirmation of our efforts to make our guests' stay as pleasant and successful as possible by offering them a cosmopolitan, hospitable and perfect service."

IDS offered the ideal business platform, especially for new companies on the dental market seeking to establish themselves with high-quality innovations, such as those for improved digital workflows and additive production, new prophylactic formulas and filling materials, pioneering intra-oral scanners and implant designs, as well as flexible workflows for management of the laboratory.

The 39th IDS is scheduled to take place from 09 to 13 March 2021. DT

Interview: "...for us it is important to improve the day-to-day work in practices and labs..."

By Dr Dobrina Mollova, DTMEA

Dr Dobrina Mollova from Dental Tribune Middle East & Africa interviewed Dr Frank Thiel, Vice President Global Research and Development CAD/CAM and Orthodontics at Dentsply Sirona at the Product Launch & Press Conference 2019 in Frankfurt, Germany on the 1st of February 2019.

VISIT DENTSPLY SIRONA AT 14TH CAD/CAM & **DIGITAL DENTISTRY** EXHIBITION **DUBAI, UAE** 12-13 APRIL 2019

Dr Frank Thiel, Vice President Global Research and Development CAD/CAM and Orthodontics at Dentsply Sirona

Dr. Frank Thiel, you began working in the CAD/CAM business unit at Dentsply Sirona 15 years ago. At around that same time, the Centre for Advanced Professional Practices (CAPP) organised the first CAD/CAM and Digital Dentistry Conference and Exhibition in Dubai. Could you share your first experience with CAD/CAM and digital dentistry and your views on its significance today with our readers for the upcoming 14th year of this conference and exhibition?

Digital technologies and CAD/CAM systems in dentistry have undergone a long development. At Dentsply Sirona, we consider ourselves pioneers in this field, as we introduced CEREC to the market more than 30 years ago. Through our own initiative and further development of both the hardware and the software, we were responsible for making intraoral scanners popular in the first place. We have always been convinced that digital impressioning is the way forward.

Now, digital impressions are widely accepted, and competition has become stiffer. So this makes us even prouder that we are able to bring a solution to the market that underscores our pioneering spirit and allows us to provide a solution to an important issue in practices – faster, precise impression taking – which is easy to manage in the usual practice environment, which is reliable, which delivers clinically flawless results, and which is simply fun to use.

And since you asked about the significance of digital technologies in dentistry – for us it is important to improve the day-to-day work in practices and labs. Digital technologies help us do this by enabling predictable treatment outcomes for many indications. Of course, the competence and skill of dentists and dental technicians will always be important – with our solutions, we want to satisfy both the practitioner and the patient and ensure sustainable success.

Dentsply Sirona is starting a new era in digital dentistry with the introduction of the new intraoral scanner Primescan. What makes this product a technological milestone and how will Primescan change how dentists work? Is it correct that Primescan is easier, faster, and more accurate than any other intraoral scanner on the market? Why is that?

Primescan is an intraoral scanner that perfects digital dentistry. We base this on four important points:
(1) A scan made with Primescan is extremely accurate. Up to 1 million 3D data points are captured per second. With optical high-frequency contrast analysis, they can now be calculated more accurately than ever before. A recent study by Prof. Albert Mehl from Zürich confirms that Primescan yields by far the best results with respect to accuracy and precision of 3D measurements. With such a high level of accuracy, you can produce precisely fitting restorations without needing to rework them.

(2) Scans can be made very quickly with Primescan. Upper and lower jaws can be scanned in less than one minute, including bite. The data is calculated rapidly and displayed on the monitor in high resolution. Practitioner and patient benefit equally from this speed.

(3) Primescan is very easy to handle and can be quickly learned. Users do not need to follow a prescribed scanning protocol, but can scan intuitively and rescan certain areas easily and quickly. The touch interface makes the software easy to use. Artificial intelligence results in a high level of automation of the individual processes.

(4) There is a very good hygiene solution for Primescan. All surfaces are smooth and easy to clean. Primescan is an intraoral scanner that can be subjected to all necessary hygienic reprocessing (wipe disinfection, autoclaving, hot air sterilisation, high-level disinfection). This is made possible by three sleeve concepts (stainless steel sleeve, stainless steel sleeve with disposable window, disposable sleeves).

For this reason, we think that we have an absolute premium product that really offers more than other intraoral scanners.

Does the new product have the flexibility and freedom to be used in addition to filling material in various dental treatments? What kind of treatments?

You are asking about what indications Primescan can be used for. Our testers answered, "While we used to ask what indications it could really be used for, today we ask what can it not be used for?" And in fact, the range of indications makes Primescan a special intraoral scanner. Examples include conventional restorations, such as crowns and bridges, inlays and onlays, and there is also the option of supporting implant planning with an intraoral scan and the corresponding restoration proposal – you can plan the outcome.

Primescan scans to a depth of up to 20 millimeters. Is Primescan more than just an intraoral scanner and if so, why?

In the past, dentists were justified in questioning the scanning quality when the patient has quite long crowns or the dentition has exposed root areas. These difficult-to-reach places can easily be captured with Primescan, without the user having to make too much effort with the scanner. This is a real advantage.

Does Primescan fulfill the dream of a precise full arch scan?

The study at the University of Zürich I mentioned before showed that Primescan also had the best results with respect to the accuracy of full arch scans. The scan requires no more effort than with partial arch scans.

All processes that use Primescan are validated. Why is that so special?

The entire system has been extended by validated interfaces to external partners. Validation makes the system so special – users are assured that the transmission will be implemented completely and securely. The respective portals can also be reached with just a few clicks.

This is special because most dentists do not want to have to deal intensively with interfaces or with data transmission technology in general. They want it to work quickly, reliably, and at any time. Predictable, reproducible. This is exactly what we offer with our internal interfaces (seamless) and the validated processes with our partners. In addition, there is still the option of an open STL export.

Are you convinced that Primescan is the starting point for other digital processes in dentistry? Why?

We just touched on this briefly before – the range of indications for 3D intraoral scanners is now wider than ever before. We still see a lot of potential especially in orthodontics and implantology.

The question of conventional versus digital impressions has been discussed for more than 30 years. Where are we today?

We already know that digital impressions are at least as good as conventional ones and also deliver very good clinical results. This has been substantiated in studies. It has never been easier for dentists to choose digital impressions. Therefore, our aim is to develop digital impressions into the preferred process because they have many advantages for everyone involved – for dentists, their partners, and the patients. Discussions with our customers have revealed that, besides the many technical advantages of scanning, it is also a whole lot of fun.

What feedback on Primescan have you had from customers regarding user friendliness and hygienic safety?

The initial feedback from users has made us very optimistic. We have received a lot of compliments for the usability and convenience, which is also experienced by the patients. We have also heard that the hygienic safety of Primescan is perceived very positively.

What might your customers expect from you in the near future regarding the development in the area of digital dentistry?

For digital processes, many things are certainly possible. I addressed monitoring previously. With Primescan, there is no effort required for progress monitoring, for example, to see whether and how the teeth have moved since the last check and how the gums have changed. All of this can be documented easily and reliably.

The second point is artificial intelligence. The intraoral scan yields a lot of useful data from which to develop solutions, for instance to specifically optimise treatment workflows. We already use learning algorithms in our programs today, and this will be increased even more in the future of digital dentistry. In any event, Primescan is a fundamental step in this direction. DT

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» Accuracy is what I want.
And Primescan is my answer. «

Martin Wohanka, Hardware Engineer

Primescan

Engineered for superior performance.

Innovation requires commitment to ambition: Primescan sets new standards in dental technology, making scanning more accurate, faster and easier than ever. It is engineered to enable all kind of treatments, from single tooth to full arch. Due to the innovative Smart Pixel Sensor, Primescan processes more than 1.000.000 3D points per second and therefore produces highly accurate and photorealistic data with great dimensional depth – even for very steep surfaces. With Primescan, intraoral scanning is as accurate as never before.

Enjoy the scan.

Learn more at: dentsplysirona.com/primescan

Overcoming the myths of bulk fill composite materials

Bulk fill composite materials were introduced for restorations more than a decade ago; however, many dentists were reluctant to try them due to the limitations and performance of earlier bulk filling materials.

By 3M Oral Care

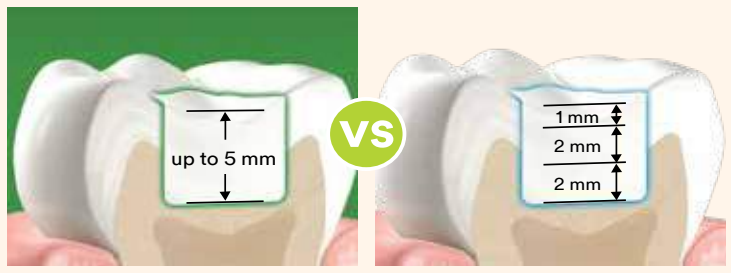
In addition, most dentists were trained to use incremental filling materials that require a layering technique in order to minimize stress/shrinkage; achieve proper adaptation and eliminate voids; and achieve proper depth of cure. Because of this, many dentists find it difficult to trust or incorporate bulk fill materials that seemingly contradict their training.

Older composite resin chemistries feature monomers that need to be layered in 2 mm increments to minimize shrinkage. This traditional layering technique requires more steps and means dentists spend more time working in a patient's mouth.

Using a traditional layering technique requires multiple steps of packing, layering, and curing, which could increase the potential for voids and/or poor adaptation with each layer. The amount of time that this layering technique requires could also increase the potential to introduce contamination from blood or saliva.

"Since the introduction of bulk fill materials, a significant amount of technology has been dedicated to addressing shrinkage stress, but depth of cure issues persisted for some time," says 3M Advanced Product Development Specialist Tim Dunbar, Ph.D. "Significant advances in materials science and chemistry in the past decade enable more translucent composites that allow curing light to penetrate to a depth of 5 mm with low shrinkage stress."

3M™ Filtek™ One Bulk Fill Restorative is designed for the posterior so dentists don't need to sacrifice wear resistance, strength and handling. It also has opacity equivalent to many typical universal composite materials used today, so dentists don't need to sacrifice esthetics while working quickly and efficiently.



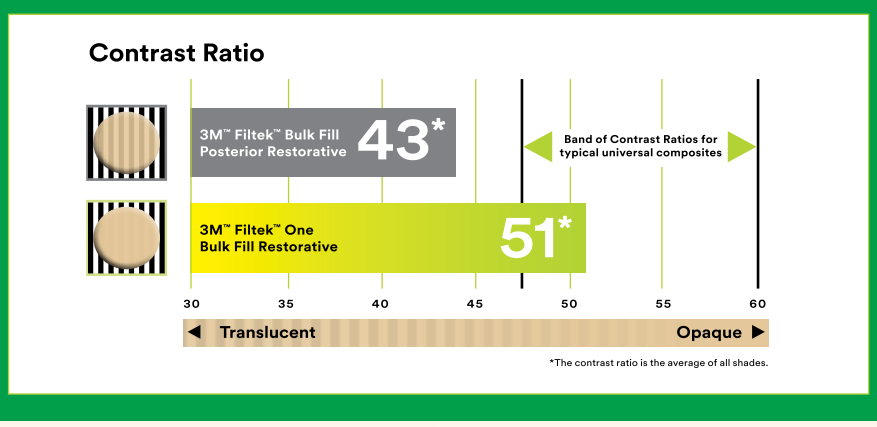
Unfortunately, despite the great advances made over the last few years, myths about bulk fill materials continue to persist. Let's take a closer look at the science of Filtek One Bulk Fill Restorative – and break down the myths of bulk fills.

MYTH 1
Bulk fill materials are not aesthetic enough (too translucent).

In the past, bulk fill materials needed a relatively high amount of translucency (low opacity) in order to fully cure in a 4-5 mm increment. The concept is quite simple – if the composite needs to cure all the way through 4-5 mm of material, then it needs to allow the light to penetrate to a greater degree.

In the decade or so since the introduction of the first bulk fill composites, the field of materials science has exploded. Research and development efforts in the past 5-10 years have yielded bulk fill composites that no longer require a choice between fast and effective depth-of-cure and esthetics. 3M designed Filtek One Bulk Fill Restorative with unique optical properties and improved opacity to provide the simplicity of one-step placement up to 5 mm, without compromising esthetic results.

3M leveraged its nanotechnology expertise to increase opacity without reducing depth of cure. In its cured state, Filtek One Bulk Fill Restorative has a higher opacity than other leading bulk fill restoratives, resulting in improved esthetics. 3M's nanofiller technology also provides superior wear resistance and excellent polish retention.



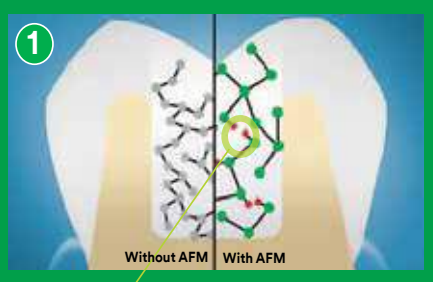
MYTH 2
It's necessary to layer bulk fill materials in order to minimize stress/shrinkage.

Stress is the amount of force exerted on a tooth due to polymerization shrinkage as it cures. This stress can break the adhesive bond, crack enamel and allow leakage at the margins. The amount of stress is determined by the shrinkage of the material and its stiffness.

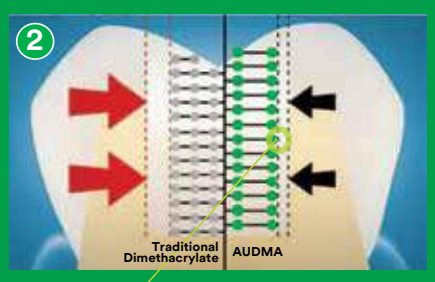
3M™ Filtek™ One Bulk Fill Restorative exerts less or equivalent stress on a tooth than some common incrementally placed universal composites, because it uses two new resin components to reduce polymerization stress.

One resin component is an addition-fragmentation monomer (AFM). During polymerization, the central group can fragment to relieve stress and the fragments can then repolymerize in a lower stress state.

The other resin component is aromatic urethane dimethacrylate (AUDMA). Because this is a larger monomer than found in traditional dimethacrylates, it limits the number of shrinkage zones. This helps reduce the amount of shrinkage and stress that occurs during polymerization.



The innovative component of the first resin is an addition-fragmentation monomer (AFM). The unique feature of this resin is that, during polymerization, the central group can fragment to relieve stress. The fragments can then repolymerize in a lower stress state.



The other resin component is aromatic urethane dimethacrylate (AUDMA). Because it's a larg-er monomer than found in traditional dimethacrylates, it limits the number of shrinkage zones. That helps reduce the amount of shrinkage and stress that occurs during polymerization.

MYTH 3
It's necessary to layer filling materials in order to achieve proper adaptation and eliminate voids.

For many decades, the incremental placement of composite has been the prevailing technique, in part because this was thought to minimize the potential for introducing voids. However, studies have shown that the opposite is true when compared to using an effective bulk fill composite.

Extruding 3M™ Filtek™ One Bulk Fill Restorative material out of its newly designed unit dose capsule creates the necessary conditions for shear thinning. This means the viscosity of the material temporarily decreases and the material flows into the cavity prep, resulting in excellent adaptation, as well as fewer defects (voids).

In an in-vitro simulated operatory test with 79 dentists, restorations placed with Filtek One Bulk Fill Restorative in 5 mm deep class II cavities had fewer defects compared to restorations made using incrementally placed composites.

MYTH 4
A bulk fill placed in a 5 mm increment won't achieve the proper depth of cure.

Methacrylate-based dental composites have the ability to achieve a very high depth-of-cure, but this has often come at the price of lowered opacity/esthetics (see myth 1). In order to achieve a high depth-of-cure while maintaining a tooth-like opacity, we must look at the interaction of light between the filler particles and the matrix.

If the optical properties (refractive index) of the filler and matrix do not match closely, light is scattered within the composite resulting in higher opacity. This will limit the depth of penetration of the curing light to effectively enable bulk curing. If the optical properties match closely, light penetrates more effectively without the scattering resulting in more translucency. This will allow for greater penetration of the curing light and allow for bulk curing. Traditionally, this resulted in more translucent restorations.

By manipulating the base chemistry that controls this behavior, we can control the stages at which the material looks opaque and translucent. The end result is a composite with the depth-of-cure required for bulk placement, and a final opacity that is closer to the natural tooth.

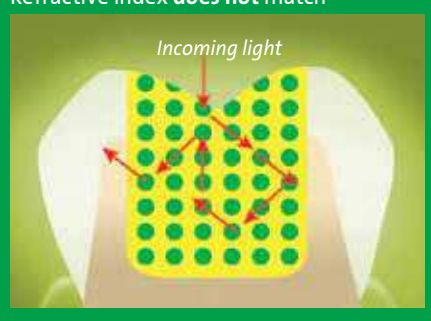
3M™ Filtek™ One Bulk Fill Restorative utilizes the science described above to achieve a uniform cure even at the bottom of 5 mm cavity, without sacrificing esthetics.

"We have data and peer-reviewed literature that indicate 3M's bulk fill materials work as intended," says Senior Technical Service Engineer Joe Edgington. "Bulk fills have been around for 10 years and many concerns and challenges have been worked out thanks to advances in materials science and chemistry."

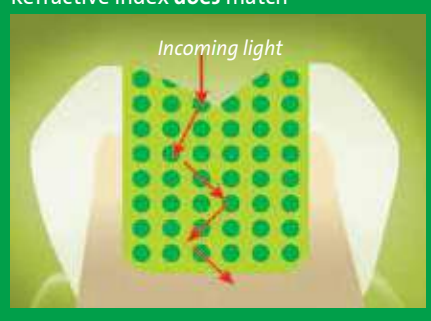
"With fewer defects, fewer voids, less chance of contamination, and less time than universal composites, dentists can make quality restorations with 3M's bulk fill composites," adds Dunbar.

For more information, contact your 3M Oral Care sales representative.

Refractive index **does not** match



Refractive index **does** match



If the filler and the resin DO have matching optical properties (bottom diagram), as is the case with 3M™ Filtek™ One Bulk Fill Restorative, then the light will not be significantly bent, and the light will be successfully transmitted through the materials, which increases the material's depth of cure.

3M

Filtek™

One
Bulk Fill Restorative

You choose it for speed. Now it's more esthetic, too.

You choose time-saving materials to be more efficient. But, as you know, while patients appreciate shorter appointments, their top concern when it comes to a restoration is how it looks—even in the posterior area. That's why 3M created 3M™ Filtek™ One Bulk Fill Restorative. Designed for posterior restorations, it gives you the simplicity and speed of bulk placement up to 5 mm ... without compromising esthetic results. Now efficient restorations can be esthetic, too.

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Intraoral welding and lingualised (lingual contact) occlusion: a case report

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By Dr Luca Dal Carlo, Dr Franco Rossi, Dr Marco E. Pasqualini, Dr Mike Shulman, Dr Michele Nardone, MD, Dr Tomasz Grotowski and Dr Sheldon Winkler

Intraoral welding was developed by Pierluigi Mondani[1] of Genoa, Italy, in the 1970s to permanently connect submerged implants and abutments to a titanium wire or bar by means of an electric current (Fig. 1). The current is used to permanently fuse the titanium to the abutments in milliseconds, so the heat generated does not cause any pathology or patient discomfort.

If possible the implants are placed without flaps. The titanium wire or bar is bent and aligned passively to the contour of the labial and lingual surfaces of the implants before applying the electric current to permanently connect titanium implants.

The technique follows a strict surgical and prosthodontic protocol, which includes using a number of implants as close as possible to the number of teeth to be replaced, achieving primary stability by engaging both cortical plates (bicorticalism), immediate splinting of the implants utilizing intraoral welding and immediate insertion of a fixed provisional prosthesis with satisfactory occlusion. The technique provides for immediate loading and does not jeopardize the integration process.[2]

Although intraoral welding has been used successfully in Europe, especially Italy, for many years, it has yet to achieve everyday use in the United States.

Members of the Italian affiliate of the American Academy of Implant Prosthodontics, NuovoGISI, have long and successful experiences with immediate loading of maxillary implants connected together by intraoral welding.[2]

By inserting the prosthesis with adequate retention and stability the same day as the surgery, patient complaints and discomfort can be avoided or substantially reduced. The instantaneous stability that results from the splinting can reduce the risk of failure during the healing period. Intraoral welding can also eliminate errors and distortions caused by unsatisfactory impression making, as the procedure is performed directly in the mouth.

Intraoral welding can fulfil a great need for business and socially active persons, as the surgical and prosthodontic procedures are accomplished on the same day. Patients can leave the dental office with a stable, esthetic and retentive prosthesis.

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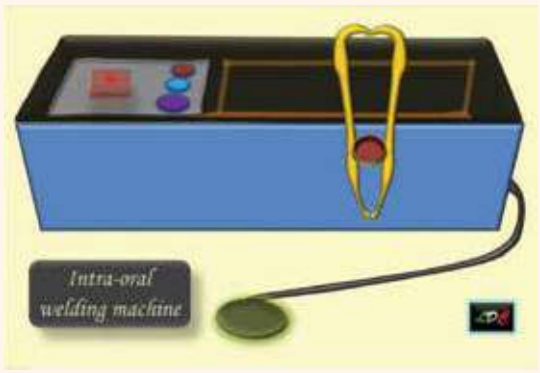

Fig. 1. Schematic drawing of Mondani intraoral solder unit

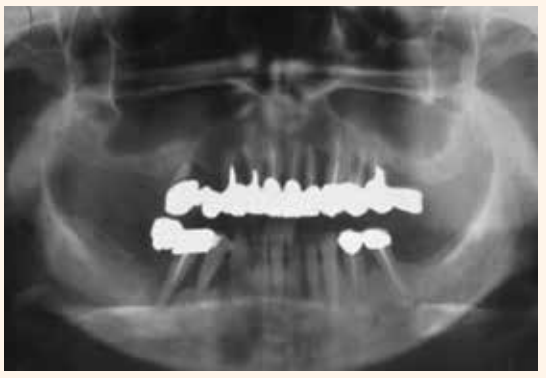
Fig. 2. Preoperative panoramic radiograph of 50-year-old caucasian woman


Fig. 3. Nonrestorable teeth visible after removal of the patient's prosthesis


Fig. 4. Eight titanium one-piece implants are inserted.

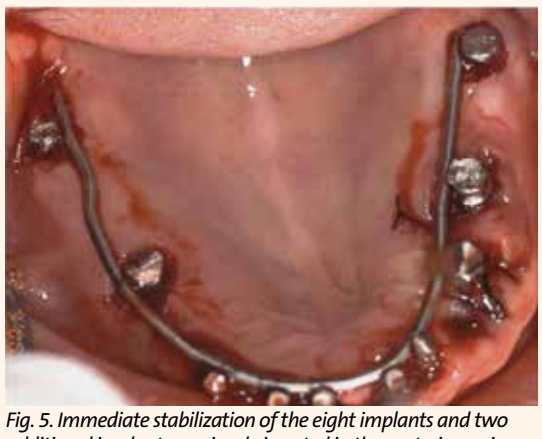
Fig. 5. Immediate stabilization of the eight implants and two additional implants previously inserted in the posterior regions, by welding each implant to a 1.5 mm supporting titanium bar

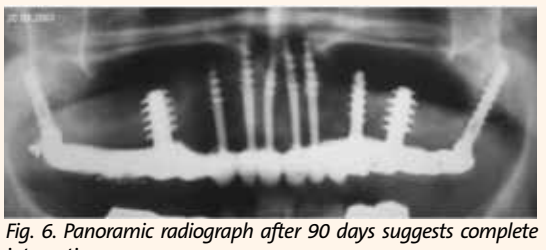
Fig. 6. Panoramic radiograph after 90 days suggests complete integration


Fig. 7. Healthy gingiva was observed after 90 days


Fig. 9. Three-tooth mandibular fixed prosthesis


Fig. 8. Lower implants welded together intraorally

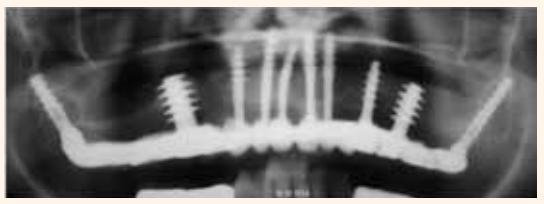
Fig. 10. Seven-year follow-up radiograph shows satisfactory preservation of bone surrounding all of the implants


Fig. 11. Intraoral photograph of the definitive prosthesis shows healthy gingiva

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◂Page 6

The flapless technique, first proposed by Tramonte[3], can be performed when the bony crest is wide and an adequate amount of attached gingiva is present. The technique allows for uneventful healing, a reduction of postsurgical inflammation and only moderate inconvenience for the patient, who can eat efficiently the same day.

Provisional prosthesis and tooth arrangement

During the surgical session a temporary resin prosthesis is inserted. Occlusal plane height must be correct. A lingualized (lingual contact) scheme of occlusion is recommended. The upper anterior teeth are best arranged without any vertical overlap. The amount of horizontal overlap is determined by the jaw relationship. A vertical overlap for appearance can be used, provided that an adequate horizontal overlap is included to guard against interference within the functional range.[4]

Lingualized (lingual contact) occlusion

Lingualized (lingual contact) occlusion maintains the esthetic and food penetration advantages of anatomic teeth while maintaining the mechanical freedom of nonanatomic teeth. Among the advantages of a lingualized occlusion are occlusal forces centered over the ridge crest in centric occlusion, masticatory force is effectively transferred more "lingual" to the ridges during working side excursions, the "mortar and pestle" type of occlusion minimizes the occlusal contact area providing for more efficient food bolus penetration and elimination of the precise intercuspation that can complicate the arrangement of anatomic denture teeth.

Lingualized occlusion also prevents cheek biting by holding the buccal mucosa off the food table by eliminating occlusal contacts on the maxillary buccal cusps, minimizes occlusal disharmonies created from errors in jaw relationships, denture processing changes and settling of the denture base, and simplifies setting of denture teeth, balancing the occlusion and any subsequent occlusal adjustment procedures.[5]

Clinical report

A healthy 50-year-old caucasian woman presented for treatment at the office of one of the co-authors (LDC) with a mobile, painful, 12-tooth semiprecious alloy-ceramic fixed prosthesis (Fig. 2). The prosthesis was removed and all of the remaining abutment teeth were found to be nonrestorable with extraction indicated (Fig. 3). After removal of the retained teeth, eight titanium one-piece implants were inserted in one session (Fig. 4).

Immediate stabilization of the eight implants and 2 additional implants that were previously inserted in the posterior regions was achieved by welding (Acerboni Intraoral Welding Unit, Casargo, Italy) each implant to a 1.5 mm supporting titanium bar (Acerboni, Casargo, Italy), which previously had been bent to fit passively on the palatal mucosa (Fig. 5). A provisional resin prosthesis was inserted, which provided an acceptable vertical dimension and lingual contact occlusion. Oral hygiene procedures were demonstrated to the patient and reviewed at all future appointments.

After 90 days, a panoramic radiograph suggested complete integration (Fig. 6) and a healthy mucosa was observed. (Fig. 7). The definitive full-arch gold-ceramic maxillary prosthesis was inserted, which greatly pleased the patient and her family.

In the lower arch, the right first and second bicuspids were extracted and implants placed in the first bicuspid and first molar regions. The implants were welded together intraorally (Fig. 8), followed by the fabrication and cementation of a three-tooth fixed prosthesis (Fig. 9).

A 7-year follow-up radiograph (Fig. 10) shows satisfactory preservation of bone surrounding all of the implants. An intraoral photograph of the definitive prosthesis shows healthy gingival tissue (Fig. 11). DT

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New PIEZOSURGERY® inserts for sinus lift by lateral approach

By Mectron S.P.A.

After 15 years, Mectron re-defines the sinus lift technique by lateral approach launching on the market 5 new PIEZOSURGERY® inserts developed in collaboration with Professor Tomaso Vercellotti, Italy.

Thanks to the new inserts shapes, the revisited protocol makes the technique even safer, minimizing the risk of membrane perforation.

Particularly:
• the new SLC insert allows to perform the osteoplasty of the sinus vestibular wall with maximum safety and unparalleled intra-operative control;
• the new high-efficiency SLO-H insert permits to execute the osteotomy procedures with the maximum safety
• the new thin SLS membrane separator is more efficient in comparison with the old generation "elephant paw shape".
• the new elevators SLE1 and SLE2, the first one to start the sinus membrane elevation from the sinus floor and the second one to finalize the sinus membrane elevation from the palatal wall, are featured by a sharp terminal part allowing to cut Sharpey's fibers from the endosteum with the maximum safety, protecting it thanks to the convexity of the tips.

The precision and the maximum evidence-based safety guaranteed by these piezoelectric inserts make this kit a wonderful addition to the surgical armamentarium for to both novice and expert surgeons.

The inserts will be available separately as well as in a Kit with all five inserts dedicated to sinus lift by lateral approach. DT

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Fig: Surgical kit sinus

Flow variations – The flow variant of the universal composite BRILLIANT EverGlow makes filling extremely simple

By COLTENE

Undercuts, sharp angles or cervical bevels present particular challenges when placing conventional composites. Therefore clinicians will benefit substantially from an innovative dental material with an optimal thixotropic property and allows effortless positioning. The flowable consistency is particularly suited for treating areas with difficult access and saves valuable treatment time.

Rapid, voidless fillings

To complete the classical presentation form, the Swiss dental specialist COLTENE now additionally offers its BRILLIANT EverGlow submicron universal composite in a flowable variant. The low viscosity filling material combines convenient application with high stability. Among other things, BRILLIANT EverGlow Flow is ideally suited for filling areas with difficult access as well as for sealing fissures. Due to its flow properties, the restorative material fully comes into its own when filling cavity linings. The flow variant can be applied directly from the syringe to the bonded surface which saves material and time. The composite, which flows under pressure, can then be comfortably brought into the required position until curing.
The exceptionally smooth consistency of BRILLIANT EverGlow high performance composite has already captivated many clinicans. Owing to its sophisticated composition of special fillers, the pliable material can be applied easily into all classes of cavities without sticking to the instrument. Not only that, it has long gloss stability and excellent polishability. BRILLIANT EverGlow Flow, a user-friendly and highly aesthetic flowable, rounds off the programme. Depending on the indication, dentists can in future choose a suitable variant from the extended product range.

Find out more

BRILLIANT EverGlow Flow, the versatile filling material, is available from dental wholesalers in a 2g syringe. Next to six universal shades, the flowable variant will also be available in a translucent enamel shade and an opaque material in shade A2. As usual, the assortment includes shades in the sophisticated "Duo Shade" system which cover two classical VITA shades in one, ranging from A1/B1 to A4/C4. DT

For further information, please contact:

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ONE COAT 7 UNIVERSAL All-purpose universal bond

By COLTENE

State-of-the art, self-etching adhesive systems are easy to apply and boost the success rate significantly, especially within restorations in the posterior area. Simultaneously they stand for predictable results, independent of the applied basis or the preferred application technique of the dentist. Coming to reliability and user-friendliness, research and development has now set new material standards:

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The universal bonding agent also comes with a new presentation form. The special triangular bottle, with it`s excellent ergonomic handling, lies comfortably in the hand and the precision dropper allows precise and economical working.

ONE COAT 7 UNIVERSAL is available as introductory kit with a 5ml bond bottle including etch gel and accessories. There are also practical single dose units for one-off use. These are also offered as refill packs in addition to the 5ml bond bottle. DT

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2019 AEEDC show hailed a success for Beverly Hills Formula

By Beverly Hills Formula

Once more, oral care experts Beverly Hills Formula were the stand out brand at this year's AEEDC in Dubai. Each year, the Irish based company takes the trip to the three-day long exhibition, ensuring their bold and eye-catching branding helps them to attract thousands to their stand.

The brand maintains a strong presence at the exhibition show, which gives the team a valuable opportunity to access and engage with dental professionals and stockists in this region, showcasing their impressive portfolio of oral care products.

Beverly Hills Formula booth

Currently retailing in UAE, Jordon, Lebanon, Oman, Qatar, Kuwait, Bahrain, Iran and Saudi Arabia, interest in the range of products has always been huge and unsurprisingly this year was no different. Already a market leader in the Middle East, the Irish based company have been expanding rapidly, thanks to their wide range of products that have truly made a difference to people's lives.

It is more than just bold packaging that has attracted a loyal fan base across the globe - the brand has developed truly ground-breaking and fascinating scientific formulations for each product ensuring they are low abrasive yet perform at the highest level. Whether it's real gold particles, or first to market activated charcoal, they have set the precedent for superior and safe teeth whitening in the comfort of one's home.

This year saw the brand showcase their two hugely successful ranges – The Professional White Range and the Perfect White Range.

The Professional White range includes Black Pearl whitening toothpaste, Pink Pearl Sensitive Whitening Toothpaste, Award-Winning Precious Pearl Enamel remineralising toothpaste and Fresh Pearl Mouthwash, as well as a Professional White Teeth Whitening Kit.

The Perfect White Family Consists of the infamous Perfect White Black, Perfect White Gold, Perfect White, Perfect White Sensitive, Perfect White Black Sensitive and Perfect White Black Mouthwash. Joining them were their most recent products - Perfect White Optic Blue, Perfect White Gold Mouthwash and the Perfect White Whitening Kit.

Following on from the success of their hero product Perfect White Black, the brand has developed their most intriguing product yet, replicating their award-winning activated charcoal formulation into a whitening kit, which is set to be released this year and is highly anticipated by both consumers and professionals alike.

The Perfect White Black Whitening Kit contains 28 charcoal infused strips as well as a whitening pen. Activated Charcoal, found in both their toothpaste and mouthwash, is known for its love of tannins and makes for an excellent tooth stain remover. The innovative Pen works as an express touch up service, helping to remove the build-up of plaque. The Activated Charcoal Whitening Strips offer professional dental whitening in 5 simple and easy to use steps that only takes 30 minutes.

Thanks to years of dedicated scientific research, Beverly Hills Formula's cutting-edge products are often are on the receiving end of highly prestigious awards. They may be a small company, but their ranges certainly command huge attention – they are confident they are the best in the business, and it is difficult to disagree. DT

Beverly Hills Formula team

New milling machines for the digital age

PrograMill: digital manufacturing of highly aesthetic restorations

By Ivoclar Vivadent AG

Ivoclar Vivadent is introducing four new milling machines which, together with the innovative materials and coordinated processes offered by the new Ivoclar Digital product portfolio, fulfil the exacting standards of modern dental laboratory and clinical technology.

PrograMill One: the new benchmark

PrograMill One is the world's smallest 5-axis milling machine. It combines industrial manufacturing quality with high precision and modern design. In the innovative 5-axis turn-milling technique, the workpiece rotates around the tool. The feed remains constant; the tool never leaves the block. This ensures short milling times and minimal tool wear. Various validated processing strategies are available for different materials and indications. The machine's wireless capabilities allow it to be operated from any location with the help of a special app for tablets and smartphones. The optical status display shows the current status of the machine. PrograMill One is coordinated with the scanners and design solutions from 3Shape. The unit has been developed for milling IPS e.max in particular.

PrograMill: new milling machines shape the digital future

PrograMill PM7: dynamic flagship machine for laboratories

PrograMill PM7 is capable of milling a large variety of materials in a wet and dry state. It is suitable for a wide spectrum of indications. The 5-axis milling process is controlled by means of an integrated PC with a touch-screen monitor. The material and tool changers work in unison so that the fabrication process proceeds independently and without interruption. The centralized management of the contents of the material changer and the tool magazine ensures that the correct milling strategy is used. An ionizer reduces the cleaning requirements when PMMA materials are processed. All in all, the PM7 offers a future-proof solution for manufacturing prosthetic restorations.

PrograMill PM3/PM5: economical and precise

PrograMill PM3 and PM5 are designed for wet-grinding and dry-milling procedures. They are capable of processing a wide range of materials for many indications. The fully automatic materials manager checks the compatibility of the tools and milling strategies. The tool changer ensures consistent, uninterrupted manufacturing. The integrated 8-disc material changer of PrograMill PM5 allows you to accomplish several milling jobs involving different materials and indications at the same time. Individual machining strategies offer short process times for the respective restorations.

Comprehensive range of accessories

A comprehensive range of accessories supplements the new machine portfolio. It comprises software programs, a common base station, innovative colour-coding to ensure the reliable handling of materials as well as a wide range of tools and special attachments. DT

IPS e.max® is a registered trademark of Ivoclar Vivadent AG.

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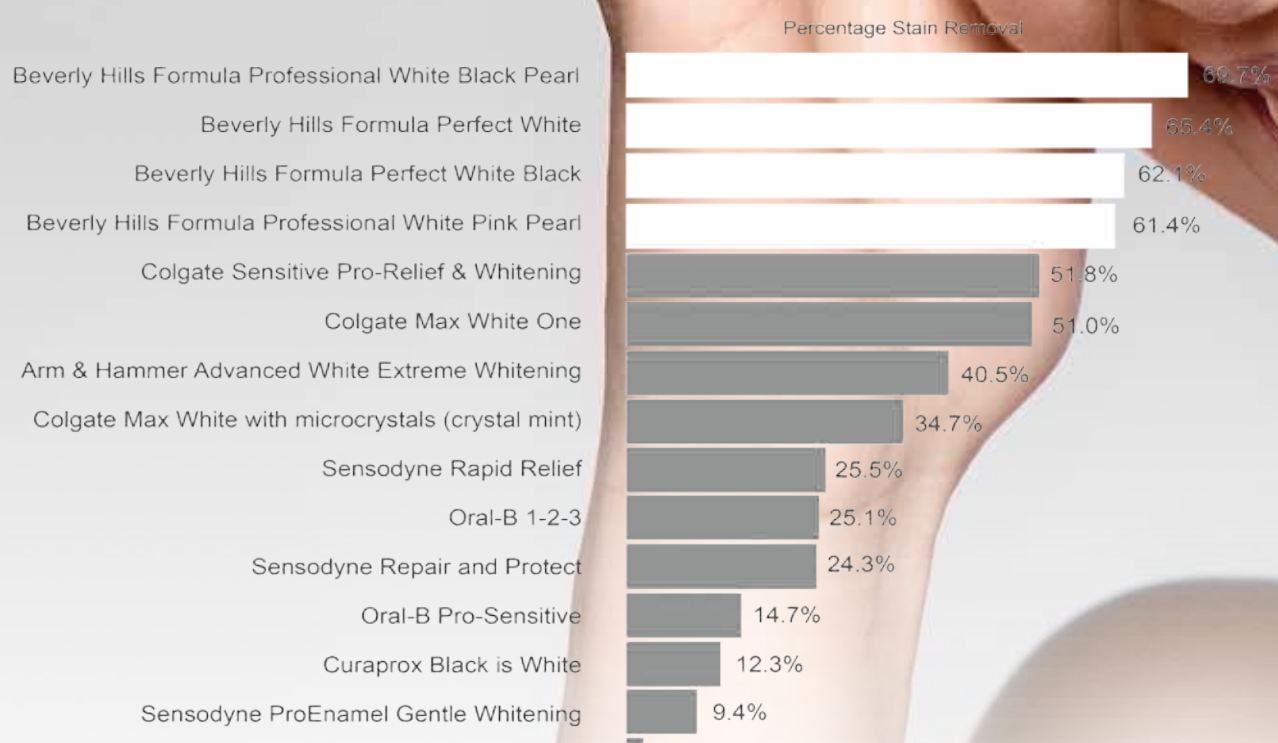

New PIEZOSURGERY® inserts for sinus lift by crestal approach

By Mectron S.P.A.

Mectron introduces a new piezoelectric technique for sinus lift by crestal approach, launching on the market 3 new PIEZOSURGERY® inserts developed in collaboration with Professor Tomaso Vercellotti, Italy.

Thanks to the new inserts shapes, the new Piezo-lift technique facilitates the sinus lift by crestal approach making the technique even safer, minimizing the risk of membrane perforation, guaranteeing a safe membrane detachment and fewer post-operative complications for the patient.

This new protocol allows the membrane elevation by utilizing the cavitation effect (Piezo Lift) and the bone grafting into the sinus cavity , which is the least invasive technique for elevating the maxillary sinus floor prior to implant placement.

Particularly:
• the new PL1 insert allows the sinus floor reaching and a safe bony ring removal
• the new PL2 insert permits to execute the sinus floor consumption and the initial membrane elevation
• the new PL3 insert allows the removal of the sinus basal cortex and the elevation of the sinus membrane using the cavitation effect.

Thanks to its shape, PL3 insert works like a piston inside a cylinder.
This safe and predictable technique (at times no longer blind) allows to overcome the limitations of current methodology that highly depend on the individual operator's skill.
The application of Piezo-Lift protocol allows treating even the most difficult cases, which present severe reduction of residual crest bone volume.

The inserts will be available separately as well as in a Kit with all three inserts dedicated to sinus lift by crestal approach. DT

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Fig: Surgical kit piezo lift

IPS e.max ZirCAD Prime: redefining zirconia

Ivoclar Vivadent presents a highly aesthetic zirconium oxide in a "one-disc solution" for dental laboratories

Fig.: IPS e.max ZirCAD Prime – redefining zirconia.

By Ivoclar Vivadent AG

Only few brands have actually managed to revolutionize the dental market. IPS e.max is one of them. Now, Ivoclar Vivadent launches IPS e.max ZirCAD Prime, a material that is redefining zirconia.
Is there a disc that features high-strength and high a aesthetics? A disc suitable to faithfully reproduce the seamless progression of natural dentition? A disc with a broad range of indication? Yes, there is a disc that fulfils the requirements of state-of-the-art all-ceramic restorations: IPS e.max ZirCAD Prime from Ivoclar Vivadent.

Gradient Technology (GT) is the secret

IPS e.max ZirCAD Prime complements the current zirconia portfolio of the successful and most-sold all-ceramic system in the world and is based on an all-new type of manufacturing technique. The Gradient Technology (GT) is the heart of the new material, combining three innovative processing steps in one product. Ingenious powder conditioning of the raw materials 3Y-TZP and 5Y-TZP, innovative filling technology and top-quality manufacturing allow for highly aesthetic results to be achieved with outstanding accuracy of fit. The sintering times among other things have also been streamlined to, for example, 2 h 26 min for single crowns in the Programat S1 1600.

A new era in zirconia technology

Unlike the Multi zirconium oxide disc, the IPS e.max ZirCAD Prime disc is not built up with layers. A continuous, seamless progression of the shade and translucency and optimized translucent properties ensure high-end aesthetics. The new disc is setting new benchmarks in the aesthetic appearance of zirconium oxide, irrespective of whether the monolithic, cut-back or veneering technique is used. IPS e.max ZirCAD Prime covers a wide array of indications – ranging from single tooth crowns to 14-unit bridges. The material features a biaxial flexural strength of 1,200 MPa (dentin) and a fracture toughness of > 5 MPa · m1/2 (dentin). IPS e.max ZirCAD Prime is available in 16 A-D shades and 4 BL shades and is compatible with the IPS e.max system. DT

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A clinical case using the Palodent® V3 Sectional Matrix System

Adjacent teeth damaged by dental bur

By Prof Dr A. Lussi Bern, Switzerland

Objective

Cutting and finishing approximal preparations with conventional instrumentation and methods may produce iatrogenic damage in adjacent tooth surfaces which subsequently requires restoration. The objective of this investigation was to determine the occurrence of iatrogenic damage and whether, under everyday working conditions in dental practice, such damage could be reduced significantly by using an alternative method and instrumentation designed especially for the purpose.

Method

Dental practitioners were asked to take impressions of teeth scheduled for Class II amalgam restorations. One group (control) prepared the teeth with conventional rotary instrumentation (n = 71), while the test group used a new method and instrumentation (n = 63). These comprised a set of files, a rightangle handpiece with reduced stroke, 36 fixed (rotation-locked) positions for the files and a cylindrical bur with a recessed front-end cutting surface. Damage to the adjacent teeth was assessed under a stereomicroscope.

Results

Using conventional methods, all adjacent tooth surfaces showed damage, often exposing deep layers of dental tissues. There was a clinical and statistically significant reduction of incidence and severity of iatrogenic preparation trauma in the test group.

Conclusion

It appears that conventional approximal box preparation results in significant damage to adjacent tooth surfaces. With the system tested, damage to adjacent tooth surfaces during preparation of proximal boxes can be significantly reduced. This should have an impact on the subsequent rate of restoration for the adjacent surfaces. DT

[1] Palodent® Plus was re-branded to Palodent® V3 in 2015.

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Insert Palodent® V3[1] WedgeGuard before starting preparation

WedgeGuard protects adjacent tooth during preparation

Remove plate from WedgeGuard, wedge remains

Initial Case. Proximal caries on the distal area of the first lower molar.

Insertion of the Palodent® V3 WedgeGuard before tooth preparation.

Cavity preparation and the Palodent® V3 system in place.

Palodent® V3 WedgeGuard showing damage caused to the WedgeGuard (and not the adjacent tooth) after tooth preparation.

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Digital workflow and application of PRF and ozone therapy in oral rehabilitation

By Dr Miguel Stanley, Dr Ana Paz, Dr Catarina Rodrigues & Dr Diogo Mendes, Portugal

There are numerous technologies that simplify the daily work, such as intraoral, extraoral and face scanners, CBCT (cone beam computed tomography) with a low radiation dose, and software processing and production, better known as CAD/CAM (computer-aided design/computer-aided manufacture), which together with new aesthetic materials and prototyping tools (milling machines and 3-D printers) are radically transforming dental medicine. This case report has the aim of presenting an example of prosthetic digital workflow, with the integration of several technologies that help us achieve treatment success.

Introduction

The digital revolution has changed the world and dental medicine is no exception. We live in the digital era: we have the materials and techniques that allow us to develop a totally digital workflow, allowing dental medicine to grow to a new level, becoming faster and more efficient, when combined with scientific and clinical knowledge.

Clinical case

In November 2017, a 39-year-old female patient came to an initial appointment at White Clinic owing to tooth pain (tooth #16). A clinical and radiographic examination were performed, including a periapical radiograph, CBCT scan (Carestream 9500, Carestream Dental), and intra- and extraoral photographs (Figs. 1–3).

In the clinical and radiographic evaluation, it was observed that tooth #16 presented an invasive cervical resorption at the mesiobuccal root. The treatment plan established was dental extraction with immediate implant placement. The tooth had been previously re-treated endodontically and restored with a definitive ceramic crown. Due to the current situation of the tooth, although the protocol in White Clinic is to preserve teeth, it had indication for immediate extraction. Also due to the lack of time, our digital team was not able to produce a surgical guide for the implant placement. Therefore, the treatment plan, included a surgical phase and a digital prosthetic phase.

The surgical treatment phase started with extraction of tooth #16, followed by excision of the root cyst and alveolar curettage (Figs. 4a & b). For good disinfection of the alveolus, ozone therapy (Ozone DTA, Apoza) was applied (Fig. 4c), taking into account the antimicrobial action of ozone, which prevents the development of the inflammatory process, favouring cellular recovery and consequently improving the post-operative healing. Once the alveolus had been disinfected, the implant bed was prepared with a sequence of implant drills from the AnyRidge surgical system (AnyRidge Surgical Kit, MegaGen; Fig. 4d). The bone defects were filled with a bone xenograft of porcine origin (Gen-Os, OsteoBiol), mixed with i-PRF (injectable platelet–rich fibrin; PRF process by Choukroun; Figs. 5a & b). Afterwards, bone densification was performed through a sequence of Densah drills (Densah Burs, Versah; Fig. 6a). This type of drill allows the clinician to perform a bone densification process.

Once the implant bed had been prepared, a 7 × 10 mm implant (AnyRidge) was placed. After placement, the ISQ (Implant Stability Quotient) was measured with a stability meter (Mega ISQ, MegaGen), and the value was 72. According to the ISQ scale, this represents high stability (Fig. 6b). A 10 × 7 mm healing screw (AnyRidge) was placed, along with a plug of A-PRF (advanced platelet–rich fibrin; PRF process by Choukroun) in order to accelerate the healing process, and sutured with 4/0 polypropylene (Hu-Friedy; Figs. 7–10). After the surgical procedure, the White Clinic postoperative protocol was applied: application for eight minutes of the ATP38 laser (Swiss Bio Inov), based on the principle of Low Level Laser Therapy that acts on the cellular metabolism and provides a better and faster postoperative healing. The patient was instructed to use a 0.2% hyaluronic acid gel (Gengigel, Ricerfarma) and 0.1% hyaluronic acid mouthwash (Gengigel First-aid, Ricerfarma) for one week after surgery, with the goal of accelerating the healing process. One week after surgery, the sutures were removed, ozone was used to disinfect the area around the implant, and the ATP38 was applied for eight minutes to promote healing.

In March 2018, four months after the surgery, the prosthetic phase was started. An impression was taken with an intraoral scanner (CS 3600, Carestream Dental) using scan bodies for an impression at the implant head (MegaGen; Figs. 11a & b). The information was sent to the Anatomic Lab, where a crown was designed using a CAD programme. After the design of the crown had been finished, the information was sent to a milling machine (Amann Girrbach) and the crown was milled (Fig. 12).

One week after the preparation, the definitive crown in monolithic zirconia was attached and the occlusion tested using T-Scan technology (Tekscan; Figs. 13a–c & 14).

Discussion

The main success indicator for dental implants is primary stability, which is one of the prerequisites for achieving osseointegration.[1] This is affected by factors such as bone quantity and quality, surgical placement procedure, and implant shape and coating.[2]

This stability can be measured with a device that analyses the resonance frequency of the implant after its placement. The software converts the received hertz waves to a numerical value called ISQ on a scale ranging from 1 to 100. The manufacturer's instructions suggest that a stable implant has an ISQ higher than 65 and an unstable implant less than 50.[3] However, these values differ from one author to another.

Nowadays, we have several options that can help us achieve a successful rehabilitation with implants. One of them is the use of a fibrin membrane rich in platelets (PRF). This has the ability to reduce the healing period and improve bone regeneration. The use of PRF as a covering membrane allows rapid epithelisation of the site surface and represents an effective barrier against the penetration of epithelial cells within the bone defect.[4]

Öncü and Alaaddinoglu evaluated the impact of implant coating with L-PRF (leukocyte– and platelet–rich fibrin).[5] The stability of the implant was measured by ISQ.[5] The use of L-PRF in the implant insertion resulted in statistically significant ISQ values that continuously increased over time. Boora et al. reported early bone remodelling around implants coated or not with L-PRF at the insertion.[6] Implants coated with L-PRF showed 50% less initial bone loss after both one and three months, respectively.[7] Nowadays, centrifugation protocols have been optimised, called the low speed concept of centrifugation, resulting in A-PRF and i-PRF. These new protocols seek to obtain a greater number of platelets, in order to increase the healing capacity, and leucocytes, therefore also increasing the regenerative capacity.[8]

Furthermore, positive effects on bone regeneration and implant surgery have been suggested when PRF is applied. Given its ease of preparation, low cost and biological properties, PRF can be considered as a reliable treatment option.[7] Although the application of PRF during implant placement or for the treatment of peri-implant defects is quite recent, several studies have already shown clinical benefits, such as higher ISQ values and marginal bone resorption.[7]

Another technique that has proven to be an asset in the success of oral rehabilitation with implants is ozone therapy. This ozone-based tool has an antibacterial effect resulting from the oxidative action on cells, damaging the cytoplasmic membranes of certain organisms, such as bacteria, viruses, fungi and parasites, without, however, the ability to damage healthy human cells.[9,10] Thus, ozone has the following advantages: accelerates the healing of soft tissue (increases the rate of physiological healing), controls opportunistic infec- tions, reduces scarring time after extraction (forms a pseudomembrane over the alveolus and protects it from physical and mechanical aggression) and aids in bone regeneration.[10–12] The literature suggests that the post-extraction socket must be prepared conventionally and disinfected with ozone for about 40 seconds, followed by placement of the implant. In this way, we avoid infections and improve bone regeneration.[10,13] A further study showed that in ozone-treated implants there was regeneration of periodontal cells similar to those around natural teeth.[10, 14]

In modern digital dentistry, the four basic phases of work are image acquisition (through scanning), data preparation/processing (through CAD software), production (CAM systems), and clinical application on patients.[15] The dental preparation can

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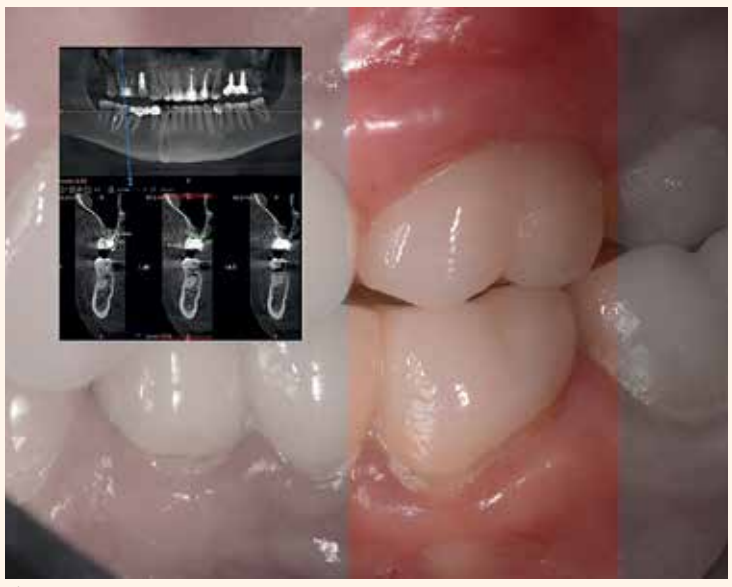
Fig. 1a


Fig. 1b

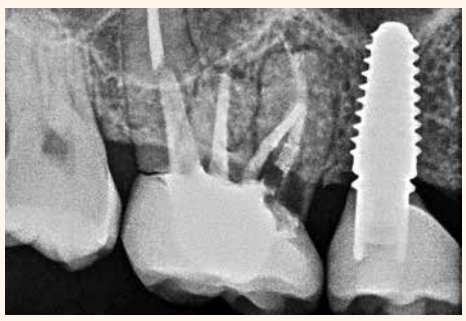
Fig. 2


Fig. 3


Fig. 4a


Fig. 4b


Fig. 4c


Fig. 4d

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Fig. 5a


Fig. 5b


Fig. 6a

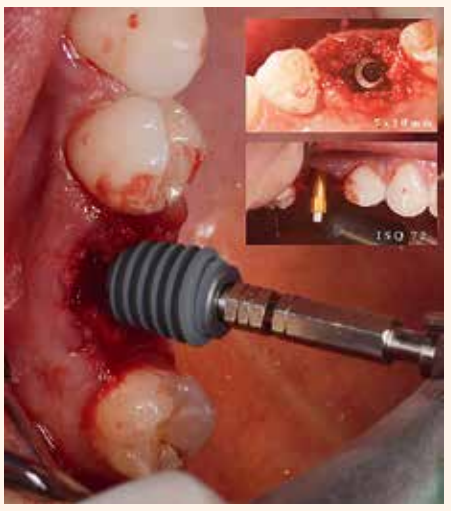
Fig. 6b


Fig. 7


Fig. 8


Fig. 9


Fig. 10

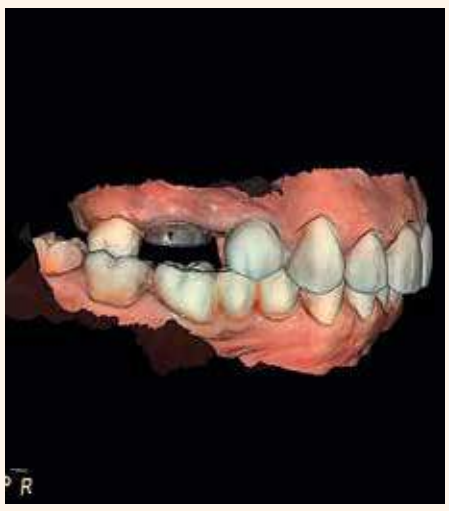
Fig. 11a


Fig. 11b

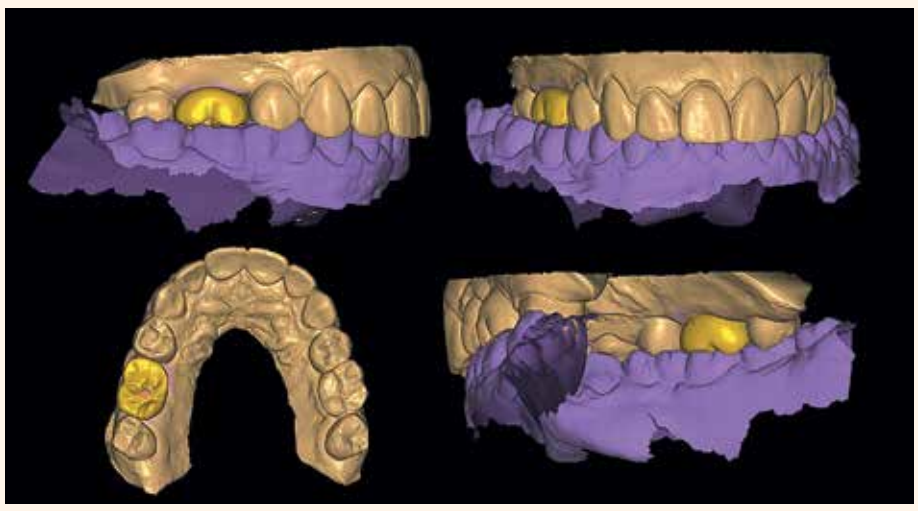
Fig. 12


Fig. 13a


Fig. 13b


Fig. 13c


Fig. 14


Fig. 15a


Fig. 15b


Fig. 15c

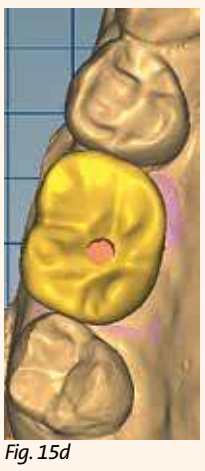
Fig. 15d


Fig. 15e

be scanned outside the oral cavity, on the plaster model, or inside the oral cavity by an intraoral scanning system.[16]

Optical impressions have several advantages over conventional impressions. Among them, the most important is the reduction of patient stress and discomfort. Moreover, they are time-efficient and can simplify clinical procedures for the dentist, especially for complex impressions (in patients with undercuts and/or in oral implantology, when multiple implants are present). In addition, optical impressions eliminate plaster models, saving time and space, and allow for better communication with the dental technician. Finally, optical impressions improve communication with patients and are therefore a powerful marketing tool for the modern dental clinic.[17,18]

Regarding accuracy as compared with conventional impressions, optical impressions are equally accurate for individual restorations or three- to four-unit bridges on natural teeth and on implants. Conversely, conventional impressions still appear to be the best solution currently for long-span restorations, such as fixed full prostheses on natural teeth and implants (with a higher number of prosthetic abutments).[17] Significant differences in trueness have been found among different optical impressions. For each scanner, the trueness was higher in a partially edentulous model than in a fully edentulous model.[19]

Conversely, the disadvantages of using optical impressions are the difficulty in detecting deep margins in prepared teeth and in the case of bleeding, the learning curve, and the purchasing and maintenance costs.[17]

Nowadays, we also have the possibility to superimpose the information related to the teeth and gingivae, received from the intraoral scan, over the bone-related information acquired with CBCT. It is therefore possi- ble to plan the optimal positioning of implants with software to guide the surgery. Planning data is transferred to a surgical template that can be physically fabricated in various ways and with different materials. This guide will help the surgeon correctly position the implants without needing to raise a flap.[18]

After obtaining the digital model, we proceed to the preparation of the virtual part through the CAD software that defines the geometry of an object, while CAM programming directs the fabrication process.[20] The CAD/CAM process eliminates current conventional processes, such as the melting and subsequent manipulation of the material after the mechanical working of the same. Pieces made by the CAD/CAM process have a more precise fit compared with conventional methods for dental prosthetic manufacture.[21]

The main concern with CAD/CAM restorations lies in the marginal fit. However, nowadays CAD/CAM parts show an adaptation with gaps of only around 40 µ.[16,22,23]

Conclusion

The use of new technologies in dentistry, such as the application of PRF, ozone therapy and intraoral scanners, has contributed significantly to the success of rehabilitation with dental implants, reducing the time for implant placement and for their restoration. DT

Editorial note:
A list of references can be obtained from the publisher.

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Specialist in Prosthodontics
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of Restorative Dentistry

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Dr. Adam Toft, UK
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Group 3 Registration Open | Pathway to UK Masters | 168 CME & Daily Hands-on

Group 3 started on 21 March 2019. A delegate could start the programme from Module 2 (19-22 June 2019) and compensate Module 1 with Group 4. As the modules are not required to be completed in a consecutive way, this will not impact the learning experience of the delegates in anyway.

Certificate | 3 Modules | 12 Days

Module 1 | 21-24 March 2019 (4 days) | Fundamental of Endodontics
Programme outline: Introduction to contemporary endodontics. Understanding of instrument design and its effect on prevention of iatrogenic errors.
Hands-on: Hand filing and lateral compaction techniques.

Module 2 | 19-22 June 2019 (4 days) | Aetiology and Diagnosis of Endodontic Disease
Programme outline: Microbiology of endodontic disease and its relationship with the host immune response.
Hands-on: Rotary Niti and advanced thermoplastic obturation techniques.

Module 3 | 12-15 September 2019 (4 days) | Traumatic Injury, Pain and Its Management
Programme outline: Emergency endodontics and diagnosis in depth. Odontogenic and non-odontogenic pain. Diagnosis and management.
Hands-on: Rotary NiTi and thermoplastic obturation techniques.

Diploma | 3 Modules | 12 Days

Module 4 | December 2019 (4 days) | Dental Resorption and Pattern of Tooth Fracture & Implant Prosthodontics
Programme outline: Understanding advanced endodontic problems. Handling endodontic failure alternatives related to implants.
Hands-on: Reciprocating Niti and Carrier based thermoplastic obturation techniques & Implant prosthetic and surgery on phantom heads

Module 5 | March 2020 (4 days) | Restoration of Endodontically Treated Teeth
Programme outline: Occlusion and whole patient care. The restorative endodontic interface. Plastic restoration, posts, intra and extra-coronal restorations, cuspal coverage amalgam vs composite.
Hands-on: Placement of core restorations and post retained restorations.

Module 6 | June 2020 (4 days) | Management of Endodontic Failure
Programme outline: Endodontic retreatment, surgical endodontics.
Hands-on: Re-treatment of common endodontic obturation materials. Apical micro-surgery on cadavers (animal).

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Revolutionary Technology in Additive Manufacturing – by 3D Systems

By 3D Systems

NextDent™ 5100 by 3D Systems, a high-speed 3D printer – powered by Figure 4™ technology helps dental laboratories and clinics redefine their workflow to achieve improved accuracy, repeatability and productivity with lower total cost of operation. When used in conjunction with the company's robust portfolio of certified NextDent materials, dental labs and clinics are able to address the broadest range of indications from a single printer available today. This plug-and-play solution integrates with the industry's state-of-the-art intra-oral scanning and software solutions delivering a much more precise result than available with manual production. The benefits of the NextDent 5100 solution extend to the patient – reducing the time required to produce orthodontic and prosthodontic devices, and the number of office visits needed to complete treatment. This end-to-end solution combining materials, technology, software and services will help dental labs and clinics bridge from traditional methods to a digital workflow, revolutionizing their business.

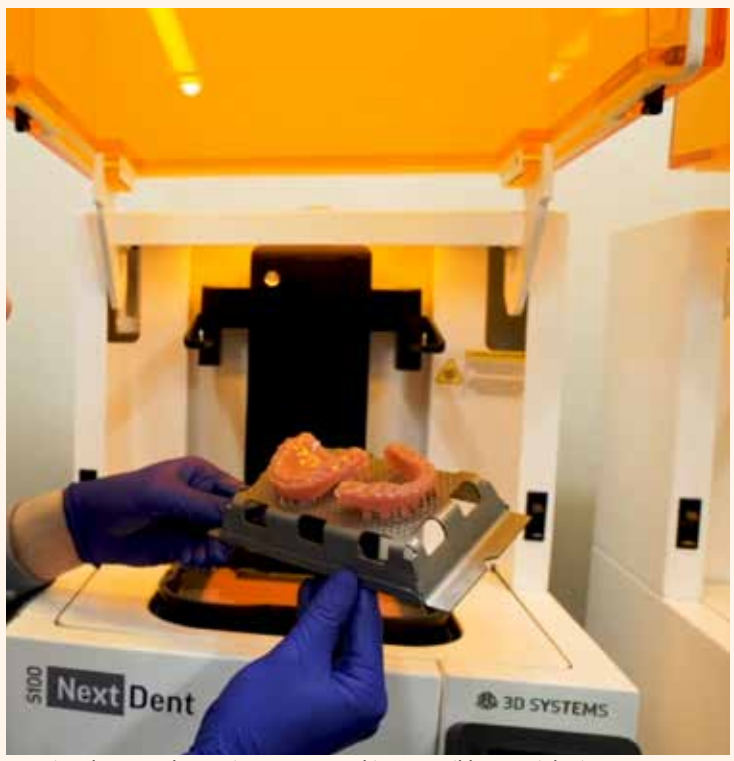
"With 3D Systems' NextDent solution, dental laboratories and clinics are now able to produce dental devices at dramatically increased speed-up to 4X faster than other available solutions - while reducing material waste and capital equipment expenditure as well as reliance upon milling centres," said Rik Jacobs, vice president, general manager, dental, 3D Systems. "Benefits also extend to the patient by reducing the time it takes to produce prosthodontics and orthodontics, as well as the number of required office visits."

This new solution is already demonstrating its ability to truly revolutionize the dental workflow.

"The NextDent 5100 is the fastest dental 3D printer I've ever seen, with accuracy and precision that result in extremely fine detail," said Adrienne Slevin, director of education and technology, Dental Arts Laboratories (a NextDent 5100 beta test site). "I've also found it very simple to use. The 3D Sprint™ software is so robust - it handles objects that none of my other printers will accept. The post-processing is equally simple and straightforward."

Dental Arts Laboratories has been able to achieve print speeds more than 4X faster than comparable printers – completing print runs for some indications in as little in 28 minutes. 3D Systems' 3D Sprint software, which is bundled with the NextDent 5100, provides Dental Arts Laboratories with a complete CAD optimization and print management tool, helping to more efficiently produce dental devices.

The NextDent 5100 is powered by 3D Systems' proprietary Figure 4™ technology, which facilitates high-speed 3D printing of dental devices and fixtures. The printer is compatible with industry-leading, intra-oral scanning and dental software solutions, delivering more precise results than conventional manual production techniques. This end-to-end digital workflow also provides higher and more predictable uptime, with a significant reduction in risk for the operator.



3D Printed Denture base using NextDent™ biocompatible material using NextDent™ 5100

3D Systems is also providing 18 new NextDent materials for an unprecedented total of 30 different options. All NextDent materials are biocompatible and CE-certified to cover a broad range of dental applications for lab managers, dental technicians, dental prosthetic technicians and clinical prosthodontists and orthodontists.

"As of this week, we're shipping the NextDent 5100 for Dental. I'm pleased with how it has performed through the testing phases, and that dental labs and clinics are seeing the power of 3D printers redefine digital dentistry," said Vyomesh Joshi, president and chief executive officer, 3D Systems. "With the addition of these printers, 3D Systems offers the industry's widest range of regulatory-approved 3D printing materials and technologies that allow dental labs and clinics of every size to improve their customer service and competitiveness with more accurate dental devices, delivered faster than ever before." DT

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Why occlusion matters?

By Vivek Gupta, UK

Occlusion is the cornerstone of successful dentistry, however, it also is perhaps the most misunderstood subject in dentistry. Why do restorations done with occlusal understanding last the test of time, whilst a lack of occlusal understanding causes iatrogenic damage to patients?

90% of the patients have occlusal disease, so learning the Principles of Occlusion and about Occlusal Assessments will allow you, as a dentist, to begin to treat occlusal disease, confidently and competently.

Understanding the language of occlusion and the schools of thought that exist will allow you to fully integrate the 5 principles of occlusion into your daily dentistry.

Knowing the theory of levers will allow delegates to explain clearly and logically to patients such that consent given is informed and patients are educated correctly about occlusal disease. Allowing them to make informed and legally correct choices, whilst allowing the clinician to practice defensive but correct dentistry.

Large VH and HV slides, when to treat and when to refer is fundamentally important. Understanding how this works and how these can be used to treat patients will reduce treatment or restoration failure.

Knowing when to use splint therapy, types of splints and duration and protocol of treatment will allow you to provide excellent care for all your patients bringing a whole new area of treatment available for your patients. DT

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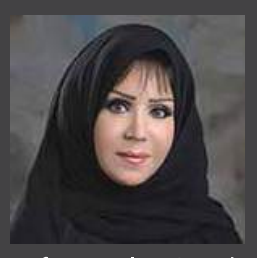
Prof. Paul Tipton, UK
Specialist in Prosthodontics
President, British Academy of Restorative Dentistry



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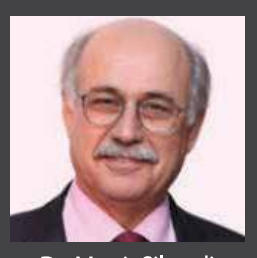
B.D.S., M.S., M.Sc., M.C.D.

Prof. Christer Dahlin, Sweden
Specialist Oral & Maxillofacial Surgery, Professor in Oral Surgery and Guided Tissue Regeneration



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Module 1 | 25-28 June 2019 (4 days) | Basics of Implantology
Programme outline: implant market, osseointegration, treatment alternatives, treatment planning and patient selection, basic surgical techniques and protocols. Hands-on training: surgical techniques and medico-legal aspects to implant dentistry.

Module 2 | 31 October - 03 November 2019 (4 days) | Treatment Planning and Surgical Treatment
Programme outline: implant design, radiographic techniques, implant surgery, implant specific treatment planning. Basic practice management.

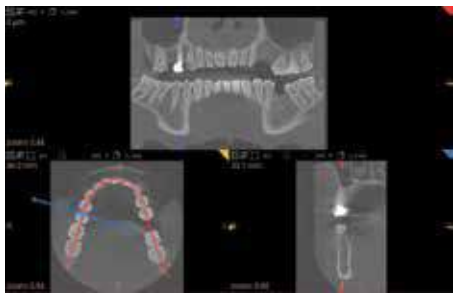
Module 3 | 23-26 January 2020 (4 days) | Restorative Aspects of Implantology
Programme outline: restorative techniques, prosthetic hands-on training, patient treatment, follow-up and oral hygiene, complications to avoid and treat. In depth practice management.

Diploma | 3 Modules | 12 Days

Module 4 | 16-19 April 2020 (4 days) | Immediate and Early Loading Concepts and Treatment of the Resorbed Jaw
Programme outline: tooth now concept, immediate and early loading concepts from single tooth to fully edentulous patients, severely resorbed jaws, sinus lift and ridge splitting techniques, hands-on training and live patient surgical treatment.

Module 5 | 11-14 June 2020 (4 days) | Medical Compromised Patient and Soft and Hard Tissue Management | Aesthetic and Restorative Challenging Patient
Programme outline: medications related osteonecrosis, GBR techniques, soft tissue management, implant aesthetics, ceramics and implants.

Module 6 | 03-06 September 2020 (4 days) | Rare Complications and Techniques
Programme outline: rare complications, combination implants and teeth, live patient treatment, written and oral examination and case presentations.



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Short cut in the digital fast track

Exact reproduction of provisionals with IPS e.max Press Multi

By Dr Hyun-Jun Jung and Kyung-Sik Park, Seoul/South Korea

The shape of an anterior restoration significantly influences the symmetry of the gingival contours. Provisionals that have proved to be suitable both in terms of their function and aesthetics allow permanent restorations to be precisely manufactured with the help of digital methods.

Unfavourably positioned teeth and/or an asymmetric contour of the soft tissue represent a considerable challenge in the already difficult anterior zone. In order to achieve a natural-looking result, the shape and shade of the restoration have to be suitably matched to the remaining teeth and furthermore the soft tissue needs to be properly conditioned. In many cases, provisional restorations are initially used by the dental team so that the special requirements of the gingiva can be effectively addressed.

Case study

The 33-year-old patient consulted our practice about having defective dental braces removed after three years of orthodontic treatment. He asked us to treat the carious lesions in his teeth and enhance the appearance of his smile. The first aesthetic analysis revealed an unfavourable length-to-width ratio of the anterior teeth (Fig. 1). As a result, the patient wished to have his front teeth lengthened. The upper left canine had to be endodontically treated due to advanced necrosis of the pulp tissue.

Planning

Our plan was to reconstruct the upper anterior teeth. In choosing the most suitable material for the restorations, we had to take into account the fact that the patient enjoyed eating hard nuts. Furthermore, he reported that he had a habit of grinding his teeth at night and clenching his jaws. Consequently, the anterior crowns would have to be not only functional and aesthetic, but also very strong and tough. We planned to use six all-ceramic crowns to optimise the length-to-width ratio (tooth lengthening) and even out the gingival contour.

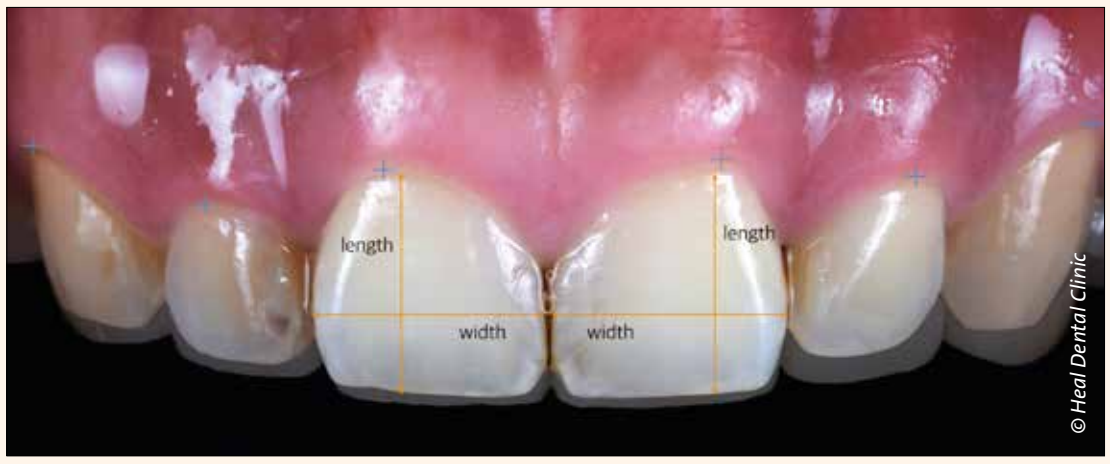

Fig. 1: Preoperative view

Fig. 2: IPS e.max Press Multi ingot shade A2

Manufacturing technique and selection of the materials

In order to minimize the risk of fracture of the ceramic restorations, we decided to use IPS e.max Press lithium disilicate ceramic, which demonstrates a high toughness of 470 MPa as well as excellent aesthetics. In addition to the monochrome press ingots, this ceramic system includes a polychromatic material (Fig. 2). IPS e.max Press Multi ingots are used to fabricate highly aesthetic monolithic restorations that do not need any characterization. They feature a lifelike progression of the shade and translucency between the dentin and incisal areas.

The press technique, which involves the use of a full-contour wax-up, offers a quick and uncomplicated method of manufacturing crowns. Moreover, the press technique allows us to reproduce delicate gingival contours with utmost precision. In restorations that are built up in layers, the ceramic sometimes shrinks, making it difficult to accurately replicate the gingival contours of the provisionals. In our opinion, the IPS e.max Press Multi ceramic has two decisive advantages. First of all, its true-to-nature shading imitates that of natural teeth in the cervical and in the incisal region. In contrast to the restorations pressed with monochrome ingots, the polychromatic restorations require less time and effort to fabricate, since they do not have to be customized with layering ceramics in the incisal region. Secondly, IPS e.max Press Multi has just the right translucent properties to allow the necessary transmission of light.

Fig. 3: Situation after the removal of caries lesions and root canal treatment

Fig. 4: Provisional composite resin restorations for evaluating their function and aesthetics

Fig. 5: Final preparation of the teeth

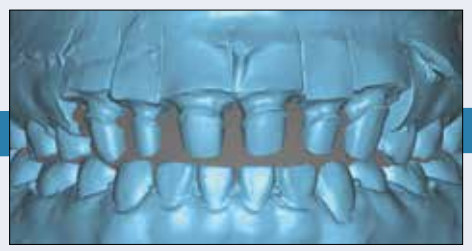

Fig. 6: Scanned data of the final preparation

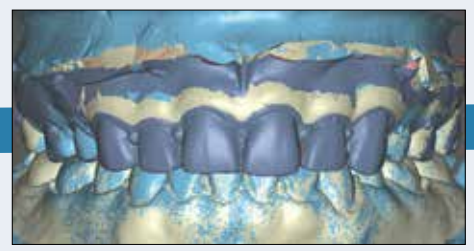

Fig. 7: Superimposed scanned data of the prepared model and the model with the provisional crowns

Fig. 8: Slight adjustments during the design phase

Fig. 9: ProArt CAD Wax yellow disc

Fig. 10: CAD/CAM-manufactured 09 — ProArt CAD Wax yellow disc full-contour wax crowns

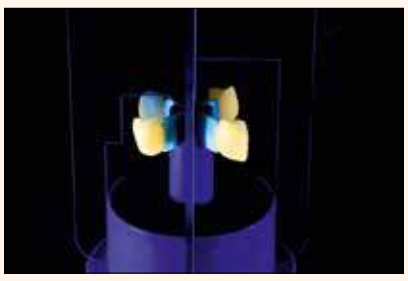

Fig. 11: Full-contour wax crowns attached to the IPS Multi investment ring base and verification of the position of the wax crowns with the help of the IPS Sprue Guide

Fig. 12: Completed crowns on the model

Clinical treatment

First, endodontic treatment was performed and the carious lesions were removed. Then the teeth were restored with composite fillings. The front teeth requiring treatment were suitably prepared (Fig. 3) and the provisional crowns were placed (Fig. 4). The right lateral incisor was lengthened. The provisional crowns helped to support the gingival contours and establish a symmetric appearance. Once the desired symmetry of the teeth and gingival tissue was attained, the teeth were prepared for the permanent restorations (Fig. 5) and impressions were taken.

CAD/CAM processes in the fabrication of restorations

Prior to the removal of the provisional crowns, additional precision impressions were taken. In the laboratory, the data of the preparation models and the provisional crown models was captured using the double scan method. The digital data sets were superimposed on each other.

▸Page 24

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Fig. 13: IPS e.max Press Multi restorations immediately after placement

Fig. 14-15: Result after one month in situ

The abutment teeth were separated and the margins and contours were adjusted (Figs 6 to 8).

This approach allowed the shape of the provisional crowns to be exactly replicated. We focused on recreating the subgingival contours, which support the oral soft tissue, so that the restorations would not have to be individually adjusted in the dental office. The crowns were milled from a dimensionally stable wax disc. ProArt CAD Wax yellow was used in the present case (Figs 9 and 10). This material is specially designed for use with IPS e.max Press. The smooth surfaces of the wax ensure precision results and high accuracy of fit. The material burns out without leaving any residue. Up to this point, it was possible to reduce the manual work to a minimum.

Spruing and pressing

In the next step, the wax crowns were reproduced with a pressed ceramic (IPS e.max Press Multi). For the investment procedure, the milled wax crowns were attached to a special prefabricated precision wax component (IPS Multi Wax Pattern). At this stage, it is important to make sure that the attachment joint is not too thick and that it is aligned with the labial surface. This helps to accentuate the unique shade gradations of the material. The wax restoration attached to the Wax Pattern was subsequently secured in the slot of the IPS Multi investment ring base. The position of the sprues was checked with the help of the IPS Sprue Guide (Fig. 11). The shade progression within the crown can be adjusted as required. For example, if the incisal portion should be more pronounced, the Wax Pattern is simply moved downward on the investment ring base (max. 2 mm). The preheating, pressing and divestment steps were carried in the customary way and in line with the instructions of the manufacturer.

Finishing

The pressed restorations can be adjusted if desired in order to accentuate certain individual characteristics. In the present case, the unglazed restorations were tried in the patient's mouth before the stains and glaze firing. At this stage, most of the clinically important properties were clearly recognizable: tooth axes, suitable pressure on the adjacent soft tissue (e.g. papillae and gingival contour), harmony of the lip line and incisal edges as well as the symmetry of the crowns. The patient was satisfied with the optimised lengthtowidth ratio of the teeth. The main aim now was to reproduce this situation with utmost precision. The inter-occlusal record was sent to the laboratory in order to minimize the work involved in the adjustment of the occlusion. The surface texture of the IPS e.max Press Multi crowns was created with suitable grinding instruments before the glaze firing cycle. The restorations were then characterized with IPS Ivocolor stains (copper, white and anthracite) and glazed. The crowns were manually polished to the desired brilliant sheen (Fig. 12).

Placement

The excellent collaboration of the dentist, dental technician and the patient paid off: The restoration was swiftly placed in the practice without having to make any further adjustments. The clinical situation which was created on the model and with the help of provisional restorations could be successfully reproduced in the permanent restoration (Fig. 13). The patient and the dental team were highly satisfied with the result. The entire treatment process was straightforward and efficient.

Result

One month later, the teeth and gums looked beautiful and healthy without any inflammation (Figs 14 and 15). Digital workflows minimize efforts but maximize aesthetics. The possibility of replicating the subgingival contours of the provisional crowns allowed a variety of modifications to be made during the treatment process. The IPS e.max Press Multi material itself offers an impressive array of aesthetic properties. If a restoration requires even more individualised characteristics, the incisal area can be built up with IPS e.max Ceram layering materials (cut-back technique). The presented process shows that the traditional press technique combined with CAD/CAM methods offers a wide variety of benefits and provides a basis for new and innovative applications. The discovery of further creative uses involving a combination of these two techniques is only a question of time. DT

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Reliable planning for an optimal workflow

By Dentsply Sirona

Part of creating an optimal workflow involves the ability to reliably plan for variables that differ with each patient. 3D imaging gives the clinician the ability to view anatomical structures not seen in two-dimensional images. The following case study involving a male patient in need of a restoration shows the advantages of utilising 3D imaging and an integrated digital workflow.

Methods

In this case, an Orthophos SL 3D from Dentsply Sirona was used for both panoramic and DVT scans. Digital impressions of the patient were taken with a CEREC camera and implant planning took place within the

Galileos Implant software. For guided surgery, the team used CEREC Guide 2 milled in-house at their dental laboratory on an inLab MC X5 milling machine.

Case Study

A 52-year-old male patient presented to our practice with gap in the area of teeth 45-47. He wanted this area restored. We used the Orthophos SL 3D to take a panoramic scan for planning purposes.

The patient opted for a treatment plan involving the insertion of two implants and then an implant-supported bridge. Digital imaging, combining DVT with CEREC optical impressions were used to plan the implant surgery in Galileos Implant software. The software creates an implant proposal as well as enables planning of the alignment of the prosthetic. The ability to plan and perform virtual surgery allowed the team to maximise safety and minimize risk. CEREC Guide 2 was chosen in the treatment plan and then milled in our practice to use during surgery.

An additional DVT image was made in the Orthophos SL's Low Dose Mode as a check post-implantation. Hybrid abutments on ti-base for the final restoration were chosen.

Summary

Reliable planning makes for an efficient treatment while helping to minimize risk. 3D imaging is an important part of creating a solid plan and the integrated digital workflow offered by using the Orthophos SL along with relevant planning software saves time for the practitioner and is also efficient for the patient by reducing the number of times he/she has to come to the practice.

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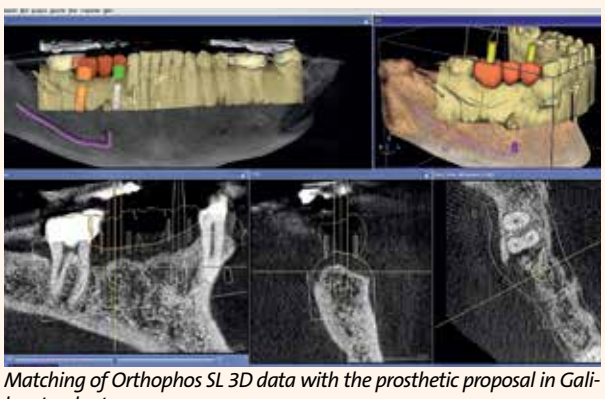
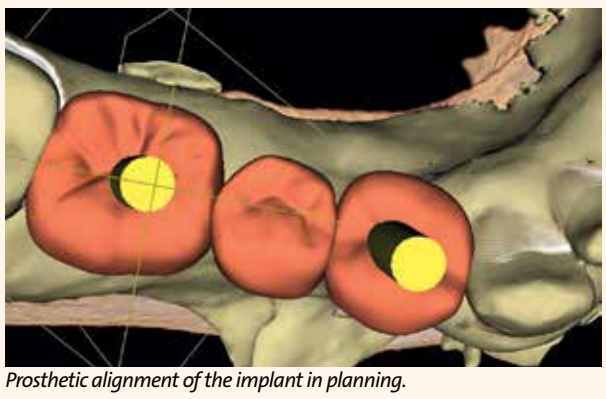
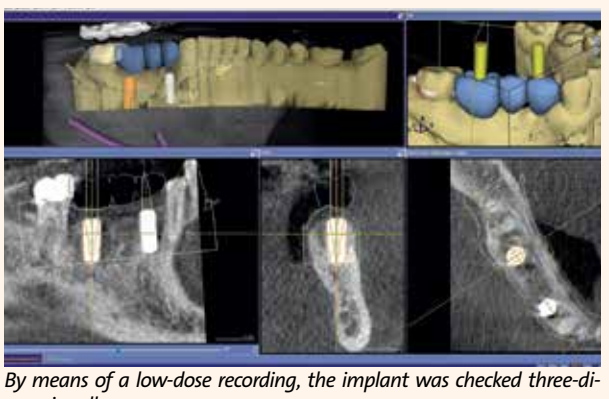


Matching of Orthophos SL 3D data with the prosthetic proposal in Galileos Implant.



Prosthetic alignment of the implant in planning.



By means of a low-dose recording, the implant was checked three-dimensionally.

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The World Congress as a turning point for laser dentistry

By Dental Tribune International

The 16th World Congress in Laser Dentistry was hosted in Aachen, Germany, giving international dental professionals the opportunity to network and learn about the latest developments in their field of expertise. Leon Vanweersch, member of the organising committee, spoke to Dental Tribune Online about the event, being promoted as the largest ever, and about his commitment to laser education as Business Development Manager at the Aachen Dental Laser Center (AALZ).

Mr Vanweersch, this year's World Congress in Laser Dentistry was expected to be the most successful, of the highest scientific level, and the biggest and most international World Federation for Laser Dentistry conference ever. Did it meet the attendees' expectations?

First of all, it was our intention to make this congress a turning point in the set-up and structure of executing such congresses. This congress integrated science and practical experience on different levels of presentations and demonstrations, including by highly rated international keynote speakers, on-stage live patient demonstrations, interactive digital poster presentations, oral presentations combined with relevant clinical skill training, short presentations on the latest research findings, outstanding clinical case presentations, company-supported workshops, and certificates for continuing education credits. We welcomed participants from all over the world travelling to Germany from 49 countries, such as Canada, Australia, China and Argentina. There were more than 200 presentations spread over the three days in a huge programme. In addition, our social events have certainly beaten those of all past World Federation for Laser Dentistry congresses.

Fig. 1: Leon Vanweersch, member of the organising committee.

Fig. 2: The attendees were enjoying a great number of programme highlights such as the get together in the exhibition area on the first day of the congress.

Fig. 3: Ever since, laser—international magazine of laser dentistry is the official media partner of DGL/ISLD

Fig. 4: Prof. Dr Norbert Gutknecht, President of the International Society for Laser Dentistry (ISLD).

What were your personal programme highlights?

Besides the fact that I am proud to have welcomed so many international attendees, I am personally very happy and excited to have welcomed back so many Aachen graduates from our mastership and MSc courses all over the world, which made this event also a kind of reunion of the AALZ–WALED [World Academy for Laser Education and Research in Dentistry] family. Besides the high scientific level of the plenary speakers we secured for the congress, I am sure that the gala event was an absolute highlight.

The congress was held under the theme "Three decades of laser innovation". What is the status of laser technology in international dentistry at present?

I personally think that every high-standard dental clinic today should have integrated laser or laser-assisted dentistry in their therapies, in order to claim to be innovative and state-of-the-art.

How did you initially become involved with laser dentistry?

I started already in 1992, together with Prof. Dr Norbert Gutknecht, the first laser safety officer courses for dentists in Germany at RWTH Aachen University. Over the next few years, we started to offer laser workshops in Germany and later also internationally. From 1994 on, we additionally organised the national congress of the German Society of Laser Dentistry every year. Under the leadership of Prof. Gutknecht, we did many research projects for various laser companies. An absolute highlight was the worldwide initiation of the first Master of Science in Lasers in Dentistry programme at RWTH Aachen University in 2004. For many years, we have been organising one-year mastership courses in dental laser therapy in many countries worldwide, and have produced more than 1,000 laser dentists in the time at the AALZ. DT

Mr Vanweersch, thank you for your time.

For further information, please contact:

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Module 1 | 23-26 October 2019 (4 days) | Laser Safety, Laser Devices and Diode Lasers
Laser Safety Officer course | e-learning | Laser technique (Diode lasers) | High power Diode lasers (clinics) | Scientific background and clinical indications | Skill training every day of every clinical indication | Patient treatments (demonstrations)
Hands on: Pigmentation on soft tissue, gingivectomy and gingivoplasty, frenectomy, fibroma removal, crown lengthening, depigmentation, endodontic procedure- canal irradiation performed on sheep heads | Patient treatments (demonstrations)

DUBAI, UAE

Module 2 | 11-14 March 2020 (4 days) | Module Erbium Lasers
Laser Safety Officer course | e-learning | Laser technique (Diode lasers) | High power Diode lasers (clinics) | Erbium Lasers (clinics) | Laser technique (Erbium lasers) | Er:YAG and Er,Cr:YSGG | Scientific background and clinical indications | Skill training every day of every clinical indication | Patient treatments (demonstrations)
Hands on: Preparation in enamel and dentine, generation of a retentive surface, canal decontamination, apicectomy, soft-tissue cut with short pulses, soft-tissue cut with long pulses, open curettage, crown lengthening and bone preparation performed on sheep heads. | Patient treatments (demonstrations)

AACHEN, GERMANY

Module 3 | 13-16 December 2020 (4 days) | Combined Wavelengths Therapy Concepts & Mastership Exams
Laser therapy concepts with the use of 2 different wavelengths | Written multiple-choice exam | Oral Exam (presentation of 5 patient treatments cases with diode or Erbium lasers) | Graduation Ceremony, after successful completion of an examination at RWTH Aachen University | 600 hours total workload | Over the complete course duration: case documentation & discussions

The programme targets dentists who would like to specialise in certain wavelengths. Over the course of one year, participants are taught fundamental physical and technical knowledge, and how to recognise primary, secondary, and tertiary indications on 12 attendance days split into 3 modules held over 3 educational blocks. This programme concludes with an official certificate of RWTH Aachen University, and is offered in collaboration with the RWTH Aachen International Academy, the post graduate education wing of the University.

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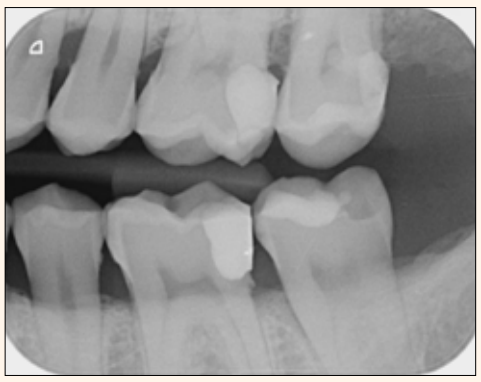
CAPP

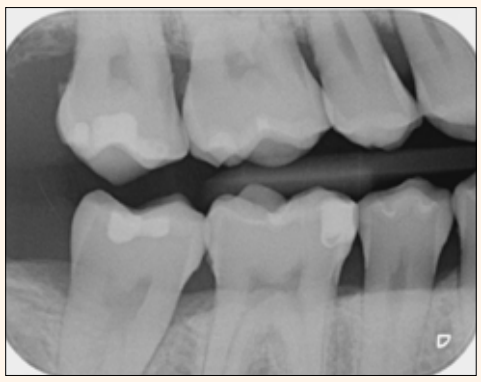
Great results in treating periodontitis using the SiroLaser Blue

By Dr Michael Krech, Germany

Periodontitis, an inflammatory disease affecting the tissues supporting the teeth, is triggered by bacterial biofilms on root surfaces and/or mineralized deposits in gingival pockets. Treatment thus focuses primarily on removing periopathogenic bacteria, generally mechanically by cleaning the teeth and gingival pockets. Dr. Michael Krech, a dentist from Marburg, presents a case history to describe how the additional use of a laser can prove advantageous when pocket depths are greater.



Left bitewing



Right bitewing

Orthopantomogram

In most cases, periodontitis becomes a chronic disease that damages the tissues supporting the teeth. The inflammatory reactions by the immune system are triggered by bacteria. Depending on the kind of periodontitis, various species of bacteria can be found in the inflamed areas. In chronic periodontitis, for example, Aggregatibacter actinomycetemcomitans, Porphyromonas gingivalis, and Prevotella intermedia can be found. In acute periodontitis, Fusobacterium nucleatum and Capnocytophaga are also present. Porphyromonas bacteria in particular are responsible for severe damage. They prevent certain defense cells (neutrophil granulocytes) from functioning. Aggregatibacter species that can penetrate the soft tissue are also significant.

Case history

The treatment of a patient with periodontitis is described below, where the SiroLaser Blue (Dentsply Sirona, Bensheim) was also used in addition to classic periodontitis treatment, scaling & root planing.

The patient (male, 36 years old) came to our practice in September 2017 for a check-up and tooth cleaning. The periodontal screening index (PSI) was carried out at this time. Periopathogenic bacteria were identified in all four quadrants. A gradual deterioration of the PSI was seen over time. The patient had had no previous periodontal treatment.

The patient's medical history was unremarkable; he was healthy, a non-smoker, and reported an occasional metallic taste in his mouth. The dentition showed no sign of caries, there were composite fillings in teeth 37, 36, 26, 17, 46, 47, 25, and 21.

The X-ray showed plaques in the approximal areas (API 45%) and periodontal anomalies in the upper jaw. The periodontal diagnosis showed generalized horizontal bone loss with a bleeding index of more than half the measured gingival pockets (52%). However, there was no indication of aggressive periodontitis.

The patient's teeth were cleaned at this appointment and he was given detailed oral hygiene instructions. We took this opportunity to take a saliva sample to determine the bacteria present. The analysis indicated an increased bacterial load, such as increased levels of "green" streptococci. They can destroy erythrocytes (red blood cells) by breaking down the hemoglobin, resulting in greenish products.

Periodontal pre-treatment was carried out, the teeth were dyed again, and oral hygiene was checked. The patient showed good compliance and the API had dropped to below 20%. Two appointments were made two weeks later for the actual periodontal treatment; subgingival cleaning and root planing were performed under local anesthesia (appointment 1: right quadrants, appointment 2: left quadrants). At the follow-up one week later, all the gingival pockets with a probing depth of > 5.5 mm were also irradiated with the SiroLaser Blue using the continuous wave mode (blue light, wavelength 445 nm at 0.6 W) for 10 seconds on each root surface affected by periodontitis. Simultaneous use during subgingival cleaning is contraindicated if there is heavy bleeding as the blood coagulates during treatment and hampers the energy input for killing the bacteria.

At the periodontal follow-up appointment two weeks later, the patient reported irritated gingiva due to the treatment for one or two days after therapy; however, he soon experienced rapid improvement. The patient's oral hygiene was considerably improved. The gingiva was a light shade of pink and unremarkable; the number of bleeding points upon probing was halved. The result of a second bacteria test confirmed the visual and intraoral healing process – none of the bacteria detected exceeded a critical limit. The patient had a positive attitude and was highly motivated to maintain this result through appropriate oral hygiene.

A recall interval of 3 months was agreed (supportive periodontal therapy) Good oral hygiene practices were evident at the first appointment – the API was 16% and the BOP 15%. The periodontal status indicated considerably reduced pocket depths. The patient reported that the metallic taste was gone.

Discussion

Successful treatment of periodontitis can be ensured only with the patient's cooperation. With suitable treatment in the dental practice and good compliance on the part of the patient, periodontitis can be virtually healed.

Experience from my practice has shown that instrumental treatment can be effectively supported with laser therapy. In this case, it was important to wait after instrumentation before use of the 445 nm laser due to the bleeding seen following subgingival instrumentation.

I am currently involved in a study under the supervision of Prof. Dr. Andreas Braun (University of Marburg) to examine the effect of the SiroLaser Blue on periodontitis treatment, the results of which will be published. Of the five patients examined and treated in my practice thus far, three have reported a rapid improvement of symptoms in the quadrants treated with laser. The laser may also have a positive effect on wound healing. The laser contributes significantly to reducing bacteria. Bacteria tests at different times suggest that the laser makes an important contribution to reducing the amount of periopathogenic bacteria. DT

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By SHOFU

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Straumann Group presents change-effecting innovations

By Dental Tribune International

COLOGNE, Germany: On Wednesday at IDS, the Straumann Group announced further investments and partnerships, and released a stream of new products.

The many new partnerships, investments and collaborations include the following: French implant manufacturer Anthogyr, a provider of innovative implant and CAD/CAM solutions; German partner MEDENTiKA, which now offers high-quality prostheses for value implant brands; Korean company Medit, a global provider of digital dentistry solutions; and ClearCorrect, a developer and producer of high-quality, easy-to-use clear aligners.

In the world of implants, Straumann released a fully tapered implant system, BLX. It is designed for immediate placement and is suitable for all treatment protocols. It optimises primary stability in all bone classes and simplifies restorative workflows. Together with BLX, an innovative drilling concept called Straumann VeloDrill has been launched—its main advantages being reduced heat generation, high drilling stability and time-savings.

The new, highly aesthetic Straumann SNOW ceramic implant, developed by its partner Z-Systems, is now available and offers the widest range of ceramic implant options, supported by digital workflows and biomaterial solutions.

Planned for release in 2020 is a premium zygomatic implant system for patients with severe maxillary atrophy, and training and education for dentists will be offered, according to Straumann.

New scanners include the Virtuo Vivo and a co-branded version of the latest 3Shape TRIOS 4 intra-oral scanner with fluorescent technology to identify surface caries and zero-radiation infrared scanning to detect interproximal caries. Straumann also plans to enter the preventative market.

Further details are available at www.straumann.com. DT

VITA is the colour expert

By OEMUS MEDIA

Marion Baumgartner, Product Manager of Technician Solution at VITA Zahnfabrik, discusses VITA YZ SOLUTIONS.

Ms Baumgartner, what makes VITA YZ zirconia stand out among all the other zirconia options on the market?
With VITA YZ SOLUTIONS, VITA is offering the system solution for precise, efficient and true-to-shade zirconia restorations. VITA YZ SOLUTIONS includes zirconia blanks in four degrees of translucency with matched system components for reliable shade reproduction. With VITA YZ SOLUTIONS, a broad spectrum of restorative concepts can be implemented. From the highly individual reconstruction to the solid standard restoration, this system offers many aesthetic options. VITA YZ SOLUTIONS is the system for consistent, accurate, true-to-shade restorations of excellent quality. The system includes liquids for colouring, staining and glazing materials for individualisation, veneering ceramics, and firing units for sintering and staining firings.

What need did VITA identify in the market that led it to develop a product with these qualities?
The zirconia market has been growing rapidly over the last ten years. With the development of the first porous VITA YZ T in 2002, VITA started the trend. In retrospect, this first variant was still very opaque and intended primarily as a framework for veneering, hence the demand for more translucent variants. In the meantime, zirconia materials have become so translucent that they can compete with glass ceramics. Owing to the increased translucency, the flexural strength is significantly lower. This was the requirement for a fourth variant: VITA YZ ST, not quite as translucent, but with higher flexural strength.

Marion Baumgartner at the VITA booth at IDS 2019

"Thanks to the successful colour adjustment of the VITA YZ materials, VITA has once again proven that it holds mastery in this area."

How much work went into developing this zirconia?
In the development and adjustment of the physical and mechanical properties, VITA relied on long-standing experience in the production of zirconia blanks of our competent process engineers. This allowed us to adjust the materials in physical and mechanical properties in such a way that the customer does not notice any difference during processing. In other words, the machinability is the same for all four materials. This allows the customer to process all materials identically with just one template. The colour adjustment of zirconia is very complex and requires a great deal of experience. Again, we relied on the great experience of our development engineers. All this resulted in a product that is as convincing in its mechanical properties as it is in colour reproduction.

What kinds of things does this zirconia allow laboratories and dentists to do that they couldn't otherwise?
With VITA YZ SOLUTIONS, all kinds of restorations can be made: from fully anatomical crowns up to 14-unit anterior and posterior bridges, fully and partially veneered single-tooth restorations and up to 14-unit bridge frameworks in the anterior and posterior regions, single-tooth restorations and up to 14-unit bridges on directly screwed-on implant abutments in the anterior and posterior regions, primary telescopes, inlays, onlays, veneers, partial crowns and tabletops.

What has the initial feedback on the product been?
Since the market launch in 2002, customers have been reporting to us very good edge stability and excellent fit after sintering. For the new variants (VITA YZ XT and VITA YZ ST), customers are delighted with the excellent colour match for the VITA classical A1–D4 shade guide.

How important is the advantage of this zirconia manufactured by the company, whose shade guides are used fairly universally across the profession?
VITA is the colour expert. As a result, we probably have the greatest experience in colour setting for a wide range of materials. Therefore, we can rely on many formulas. Our formulas and the knowledge of our development engineers have helped them to develop these colours. Thanks to the successful colour adjustment of the VITA YZ materials, VITA has once again proven that it holds mastery in this area. DT

Interview: “When you do innovation, you also have to take care of education.”

By Petar Mollov, DTMEA

Mectron S.P.A, based in Italy, has revolutionised the dental surgery world with the development of piezoelectric bone surgery equipment. At the IDS show in Cologne, Germany, the company presented a new generation of prophylaxis devices. Dental Tribune Middle East and Africa representative Petar Mollov interviewed Dr. Massimo Lemetti, CEO at Mectron S.P.A., about the new products launched at IDS and the company plans for the Middle East region.

First of all, Happy Birthday to Mectron and congratulations on this milestone, 40 years!

Dr Massimo Lemetti – CEO of Mectron S.P.A.

During your anniversary speech you highlighted the importance of technology an innovation to Mectron and how this has evolved over the years. How has this statement evolved and kept over the years represented by the products that Mectron offers?

Thank you for the birthday wishes. There were no big changes to what we do. Technology and innovation are the drivers of our activities. The goal in simple words is to exploit the existing technologies in order to facilitate the life of the doctors by proposing solutions to the problems they face in their daily activities and this is for the ultimate benefit of the patients. This has been the main driver of our activities in the past and the future, so no big changes to what and how we do. The big change is related to the way technology evolved, by moving from single visionary inventors towards the structured work of engineers grouped in teams.


Mectron celebrated their 40 year anniversary on a boat cruise on the Rhine river in Cologne, Germany

You have just mentioned the R&D which is in the DNA of Mectron. How do you sustain and motivate the over 200 employees to wake up every morning with the thought of innovation? What is your spending on R&D and how does it compare to the dental industry average?


Ligurian coast

In general we are spending approximately 20% of our turnover in R&D on yearly basis, which is about 2 to 3 times the industry’s average. This is a good representation of how important R&D is for us. Motivation of the people, all people involved in the new technologies and in bringing new technologies to the market is something that is mainly coming from inside Mectron. R&D and innovation are rough and tough roads which means a lot of days, months, years of effort, of commitment, of dedication, of passion and only then comes the satisfaction of launching a new product. This satisfaction is lasting only for very few moments because then you have to start with a new project from the beginning. This is the destiny of the people committed to innovation but it is what we like and what we enjoy doing. This is what motivates everyone in Mectron.

The Mectron Team on IDS 2019. From left to right: Dr. Massimo Lemetti (CEO), Paola Minoia (Marketing), Hossam Ghaly (Area Sales Manager MEA) and Andre Reinhold (Marketing Manager)

Tell us a little bit about how Mectron was formed and the philosophy of its founders.

The history of Mectron is, I would say, the usual way a business is started but still very interesting. Normally, such companies start with an idea shared between friends. That’s what has happened to Mectron, there were two young engineers, Fernando Bianchetti and Domenico Vercellotti who are two friends knowing each other since primary school days, spent in a tiny fisherman village located in the Ligurian Riviera. One day they were discussing the possibilities of what to do in their lives. They had an idea in doing something in the dental and the medical business for benefiting the people. They started a small company the same village where they used to go to school. From there until now, the company has developed and grown day by day, continuously, until reaching what Mectron is today - 210 employees, spread in Italy, US and Germany which are the countries where we have our main offices. We became quite big considering from where we started. We are very thankful to all our clients, doctors, dealers, friends and all the contributors to our voyage.

Mectron has been working on new projects that are being presented at IDS. Could you tell us which projects are these and how would they benefit the dental professionals using them but most importantly the patients? How they impact the dental professionals and the patients?

In general, our mission is to provide useful innovation to our clients, in order to make their lives easier and ultimately benefiting the patient. This is also what is happening with the latest products Mectron has launched. Prophylaxis line, we are launching COMBI touch and the starjet which are two devices dedicated to air-polishing and scaling. The second line of products is related to the surgical line, we are launching REX PiezoImplant which is the first implant system based on piezoelectric technology. The Prophylaxis line in general is aiming at preventing problems, the medical and dental world are moving towards prevention and of course our effort with Prophylaxis is just to prevent patients from having problems with their oral health. With regards to how the dentists benefit from our new product lines, our customers can spot the problems that need intervention and like this strengthen the patient-dentist relation. With regards to the REX PiezoImplant, this is an implant dedicated to solve a specific problem, which is placement in narrow ridges.

How important is the Middle East market for Mectron and what are your expectations for it for the near future?

For Mectron, the Middle East is an important market, and that’s is why we have developed specific organisation for the Middle East. Our regional representative Hossam Ghaly has been appointed specifically to develop the Middle East area. Additionally, we are developing a lot of educational courses in the area in order to promote our technologies and this shows our commitment to stay close to our clients. We are attending many regional events such as the Dental Facial Cosmetic Conference & Exhibition in Dubai which we will be participating in on 08 and 09 November of this year.

Mectron is involved in a lot of educational programmes thoughtout the globe. What is your strategy when it comes to dental education in the short term?

Education is something that goes with Mectron’s vision and mission parallelly because when you do innovation, you also have to take care of education, so in a certain way education is going along with our philosophy. We run a lot of educational courses around the world, especially related to our new product lines.

Could you tell us a bit more about yourself and your journey in the medical and dental field?

I joined Mectron four years ago and it has been an amazing and exciting journey. It is an honor for me to be the Head of this organisation which is composed out of many passionate people. DT

Thank you very much for this informative and interesting interview.

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PrograPrint: Ivoclar Vivadent presents new 3-D printing system for dental laboratories at IDS 2019

By Ivoclar Vivadent

COLOGNE, Germany: PrograPrint is a new 3-D printing system for use in dental technology. It is integrated into a validated workflow and comprises materials and equipment for printing, cleaning and postcuring. The printing system is a new addition to Ivoclar Vivadent's digital portfolio and complements the PrograMill milling equipment excellently. It is being showcased at IDS 2019 for the first time.

The highly precise 3-D printer, PrograPrint PR5, is the heart of the system. The automatic material recognition and intuitive operation ensure a reliable process for printing objects. The specially developed homogeneous light processing technology facilitates an even light output. The results have a high level of precision.

Ivoclar Vivadent is now showcasing an innovative 3-D printing system for dental technicians: PrograPrint.

The extremely user-friendly printer has been specially designed for dental requirements. For example, it can be used to print models and splints. A notable feature is the specifically developed cartridge system. The cartridges enable easy, contactless handling of the materials. They also protect the materials against polymerisation caused by ambient light during storage. The printed objects are cleaned with the efficient PrograPrint Clean cleaning device. Postcuring is carried out with the universal PrograPrint Cure, which completes the production of the 3-D object.

The new 3-D printer provides a selection of light-cured materials for a wide range of applications:

ProArt Print Wax burns out without leaving any residue. This material is particularly suitable for the production of objects to be pressed or cast, such as crowns and wide-span bridges, and for model casting procedures. ProArt Print Model is an opaque beige material which has similar contrast qualities to plaster. This material is suitable for the production of high-precision models that feature excellent dimensional stability—for example, models with removable dies and implant models, as well as models for the fabrication of vacuum-formed splints.

ProArt Print Splint is a highly transparent material with very good physical properties for the precise production of drilling templates and occlusal splints. It can also be used to produce a try-in base for fixed and removable prostheses, in particular for Digital Denture. DT

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Interview: Planmeca hosts daily shows at IDS

By Dental Tribune International

At this year's IDS, Planmeca is exhibiting a vast range of digital innovations and is hosting a series of shows in a spectacular enclosed 360° area, featuring a large, curved LED screen, to illustrate how its products can improve daily work at the clinic. Internationally renowned lecturers are giving detailed clinical presentations on how to realise the full potential of dental technology. Dental Tribune International had the opportunity to interview Dr Walter Renne, from the Medical University of South Carolina in the US, on the major topics of the shows, current trends in digital dentistry and the Planmeca Romexis software.

Dr Walter Renne giving a lecture titled "3-D printed smile design mock-ups" at the Planmeca booth at IDS 2019

Dr Renne, what specific topics are the focus?
The speakers are focusing on the power that the Romexis software has on patient care. The focus is on real-world clinical cases. This completely open software works synergistically with the platform of innovative Planmeca products, such as the Emerald scanner, Viso CBCT unit and Creo C5 printer to transform patient care. Everything, including surgical guides, smile design, milling and scanning, will be covered.

What are you focusing on in your presentations at IDS?
I am specifically speaking on Romexis Smile Design. When combined with the Creo C5 printer, smile mock-ups can be designed, printed and transferred to the patient in a single appointment. This is thanks to the new Creo C5 printer being one of the fastest in the industry. I can easily scan a complete arch and print the model in under 10 minutes.

What do you consider some of the most central trends in digital dentistry right now?
First, 3-D printing is a major hot topic right now, not just for surgical guides and models, but also for prostheses that are blurring the boundary between temporary restorations and definitive restorations. A race exists for speed, accuracy, ease of use and low cost.

Second, AI—to make our work on software easier, such as the software for the Emerald scanner, which uses AI to eliminate lips and cheeks automatically. Another major time-saver is the automatic model hollow and base for 3-D printing found in the Romexis Model Analyser module.

Last, virtual and augmented reality surgical tools. Planmeca is leading the way with the first virtual reality implant planning and surgical guide software. The company also has a fully integrated augmented reality surgical navigation technology that is built into the light of the dental unit to track movements.

How do you use the Romexis software in your daily dental work?
Romexis is the centre of everything: 2-D and 3-D images, including radiographs, CBCT and intraoral scans, are all completely integrated into one centralised location. It powers nearly everything that I do in my practice and is critical to my success as a clinician. DT

ICD and DTI sign media partnership agreement

By Dental Tribune International

COLOGNE, Germany: As of Wednesday evening, 14th of March, Dental Tribune International (DTI) is the official media partner of the International College of Dentists (ICD). The contract signing, which took place at the OEMUS MEDIA and DTI media lounge at IDS, was witnessed by DTI CEO Torsten Oemus, Dr Dov Sydney, Dr Mauro Labanca and representatives of Henry Schein, including Chief Global Communications Officer Gerard Meuchner.

The ICD will celebrate its centennial in 2020 and is therefore the oldest and largest honour society for dentists in the world. Sydney, International Editor and Director of Communications, as well as General Chair of the College Centennial Committee, said: "Over the past 100 years, there have been changes in social structure and the economy and yet we have continued to grow because our purpose and our goals continue to be relevant in every age and stage of world development. And now we are going to build on that with DTI and make it a long-term relationship. They help us, we help them, everybody is happy."

The organisation was conceived by Drs Louis Ottofy and Tsurukichi Okumura with the vision of an organisation of outstanding dentists. Today, the ICD has 12,000 fellows in 122 affiliated countries, from a diversity of cultures and social backgrounds and with different professional experiences.

International Editor and Director of Communications and General Chair of the College Centennial Committee Dr Dov Sydney (left) and Dental Tribune International CEO Torsten Oemus

Annual Publishers' Meeting: DTI looks towards the future

By DTI

COLOGNE, Germany: In the lead-up to the 38th International Dental Show (IDS), Dental Tribune International (DTI) held its 15th Annual Publishers' Meeting over 10 and 11 March in Cologne. This year's gathering saw 75 members of the DTI network from all over the globe in attendance to discuss the latest developments and projects the company is undertaking.

Among the highlights of the meeting was the official introduction of Dental Tribune Algeria, the newest international licence partner. Led by Dr Ouahes Aziouez, the new partner will produce Dental Tribune Algerian Edition, a quarterly publication that will focus on the latest developments in dentistry within the Maghreb region. Its first issue will be formally launched at IDS and will be available for viewing at the DTI Media Lounge in Hall 4.1 at Booth D060–F061.

The Annual Publishers' Meeting also provided an opportunity for an exciting announcement about DTI's upcoming expansion into the Scandinavian dental media market. Though the details are still being finalised, new Dental Tribune editions for the region will be launched soon, according to DTI President and CEO Torsten Oemus. "We look forward to welcoming our Scandinavian friends into the fold here at DTI and expanding our international presence," he said.

Oemus also spoke about one of the newest additions to the DTI portfolio, Smyle magazine. With its flagship German-language edition currently delivered to over 60,000 dental practices in Germany, Smyle is to be expanded to include an international English-language version later this year. "By introducing an international edition of Smyle, we will be able to highlight the latest global trends in well-being, health, beauty and more," said Oemus.

An update on the status of the highly anticipated DDS.WORLD was also provided at the meeting by Joachim Tabler and Martin Troppa, departing and incoming DDS.WORLD managers, respectively. A full-service digital marketplace for products, news, e-learning and practice management, DDS.WORLD is targeted at all participants in the dental industry. It offers a web shop and an associated search facility, practice management and inventory management systems, direct customer communication tools and much more. Attendees were informed that DDS.WORLD will initially be launched in select pilot markets—Greece, Serbia and Poland—and will provide all-in-one solutions for running a dental practice.

Alyson Buchenau, Business Development and Marketing Manager at DTI, thanked those in attendance and emphasised the importance of cooperation. "The DTI network currently reaches 785,000 dental professionals worldwide via our print and digital portfolio," she said. "If we work together, our audience will continue to grow."

This year's gathering saw licence partners from all over the globe in attendance to discuss the latest developments and projects the company is undertaking.

Experts from Dubai Health Authority, PHC Dental Center, and Rashid Hospital have combined with 3D printing healthcare startup Sinterex, to save the jaw of a patient who had an aggressive tumor.

DHA successfully saves patients jaw using 3D printing

By Sinterex

DUBAI, UAE: Experts from Dubai Health Authority, PHC Dental Center, and Rashid Hospital have combined with 3D printing healthcare startup Sinterex, to save the jaw of a patient who had an aggressive tumor.

The patient, a 17 year old girl in high school, was admitted to hospital after discovering she had a large, fast growing tumor of the right jaw. Dr Khaled Ghandour, Maxilofacial Surgeon at DHA, said that the patient was diagnosed with Ossifying Fibroma, a particularly aggressive form of tumor, which meant that the right side of the jaw had to be removed.

It was at this stage that Sinterex became involved. Sinterex is a UAE based start-up specializing in customized 3D printed healthcare products. Managing Director, Julian Callanan, explained that given the aesthetic implications and complexity of the case, it was critical to use digital planning and 3D printing to create a patient specific solution.

The workflow started with the patients CT scan, which was segmented and converted into a 3D printed physical model. This model allowed Dr Khalid Ghandour, and his team of surgeons, to visually inspect the patient's situation and to develop a treatment plan. After finalizing the treatment plan, Sinterex 3D printed a Surgical Guide, which was fitted to the patient in the operating theatre to ensure that the surgeons drilling, and cutting are guided with precision. Finally, a patient specific implant was 3D printed in bio-compatible medical grade Titanium.

Dr Khaled Ghandour stressed the importance of utilizing 3D printing in medical care by saying; In maxillofacial surgery we are working in an area where both aesthetics and function are important and operating conditions challenging. 3D printing models helps us better visualize the patient's situation, whilst 3D printing Surgical Guides and Patient Specific Implants allows us to translate plans into reality.

Dr Mohammad Al Redha, Director of the Department of Organizational Transformation at the DHA said that that this is just one further example of how the DHA has successfully used 3D printing. Other recent examples include 3D printing a prosthetic leg, removing a cancerous growth from a patient's kidney referencing a 3D model, and saving the life of a patient suffering with cerebral aneurysm.

Dr Al Redha said that the DHA is planning to further utilize 3D printing in medical care in line with the Dubai 3D printing strategy – a unique global initiative that aims to exploit technology for the service of humanity and promote the status of the UAE and Dubai as a leading hub of 3D printing technology by 2020. DT

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Interview: "Motivation and team work were the main reasons for the success and continuity of the LOS over the years."

By Kinga Mollov, DTMEA

The Lebanese Orthodontic Society (LOS) is one of the oldest dental societies in the Middle East. Kinga Mollov from Dental Tribune Middle East & Africa had the pleasure to interview Dr Mona Sayegh Ghoussoub, President of the Lebanese Orthodontic Society.

Dr Mona, could you please briefly introduce LOS and what the Society does?
Founded in 1965 in Beirut, Lebanon, the Lebanese Orthodontic Society (LOS) is one of the oldest dental scientific societies in the Middle East. Four orthodontists were instrumental in its conception: Drs. Pierre Rizkallah, Edgard Debbaneh, Frédéric Maalouf and Alexandre Khoury.

Today, the LOS is a member of the Arab Orthodontic Society, a corresponding member of the European Federation of Orthodontics and an affiliate organisation of the WFO. It has currently 250 affiliated members who are orthodontic specialists and practice orthodontics exclusively. Moreover, it contributes actively to the development and progress of orthodontics in Lebanon through the organization of one main meeting per year, as well as many seminars. Since 1993, several renowned orthodontists have participated in LOS meetings and seminars, including Drs. Robert Ricketts, Roberto Justus, Athanasios Athanasiou, Ravindra Nanda, in addition to many others.

Working closely with the Lebanese universities, the LOS supports the development of the specialty in Lebanon by furthering the continuing-education of its members and by encouraging the development of scientific research in orthodontics. In October 2001, the LOS hosted the 5th Arab Orthodontic Meeting in Beirut, during which the first directory of Arab orthodontists was released. The LOS also hosted the first meeting of French-speaking orthodontists in Beirut in February 2005. Most recently, Beirut was the site of the 11th Arab Orthodontic Meeting and 12th Lebanese Orthodontic Congress in November 2013. In 2016, the Golden Jubilee of the LOS was celebrated during the 3rd Francophone Meeting CIFO (Collège Inter-Universitaire Francophone en Orthodontie) in Beirut.

The LOS is active since 1965. Could you please tell us how far has the Society come since then?
Motivation and team work were the main reasons for the success and continuity of the LOS over the years. A few motivated and experienced orthodontists instigated the Society at the start with the ambition of better structuring the profession and keeping the orthodontists informed on latest advancements and techniques in the orthodontic field. Then it was leaded for many years by an orthodontist of talent Professor Pierre Rizkallah who braved all difficulties to maintain the subsistence of this institution. He was organising Scientific Meetings and seminars regularly inviting international and local speakers.

The goal of the succeding LOS presidents was to keep on with the progress initiated and build more regional and international connections with other dental and orthodontic societies. The LOS participation in lots of international events all over the world as well as organising many conventions in Lebanon helped in establishing good relationships with other orthodontists and dental professionals at the scientific and human levels.


Dr Mona Sayegh Ghoussoub, President of the Lebanese Orthodontic Society (LOS)

Dr Mona, you have joined the Lebanese Orthodontic Society as President in 2018. Could you please share with us your experience so far?
The experience has been rewarding and worthy. My participation as a LOS member at the beginning, then part of the executive board and chair of the scientific committee later helped me greatly in progressing as LOS President with a background at the scientific, logistic and relational aspects. Since the start, the objectives were well-defined and approved by the newly elected board and committees involved in the good administration of the Society.

Motivating orthodontists to subscribe to the LOS was one of the main goals to allow interaction and to keep them within the educational path. Interdisciplinary seminars with eminent speakers are organised on regular basis conferring different topics in relation with orthodontics.

Working hand in hand with other orthodontic Societies such as the Tunisian, the ATREO "Association Tunisienne de recherche et d'études en orthodontie", in two joint Meetings was successful and thriving. The first one took place in June 21-23, 2019 in Beirut and the second in December 14-16, 2019 in Tunis where colleagues shared their knowledge and consolidated friendships.

In February 21-24, 2019, the 13th Saudi Arab Society Meeting was held jointly with the 14th Arab Orthodontic Society Conference in Jeddah and was at a high international level. All Arab Orthodontic Societies' Presidents including Lebanon were present to exchange experience and coordinate together.

It is important to emphasise that all previous and upcoming LOS achievements are owed to the team-work and efforts made by the preceding Presidents and Committees; and as the American Author Helen Keller quoted: "Alone we can do little; together we can do so much".

What was the main goal you would like to achieve by the end of your presidency when you joined LOS?
In fact, while progressing in the work at the LOS, not only one but many fundamental goals seemed to be of major importance. If I must choose one, it would be to place the LOS in a leading and front position internationally by enhancing and supporting scientific research and publications. LOS can contribute actively to connect Lebanese orthodontists with other orthodontic organisations and institutions to attain this aim.

The LOS is annually organising many events, could you give us more information about the upcoming one?
The 17th LOS Annual Meeting entitled "Overcoming Challenges in Orthodontics" will take place in June 20-22, 2019- Beirut, in addition to further programmed events. International distinguished speakers will participate at this event to share their knowledge and experience with the Lebanese orthodontists. As this meeting is planned to be of a high scientific level, not only Lebanese but also orthodontists from all nationalities are invited to join in order to combine efforts and plan for future collaborations. All information concerning LOS activities are regularly displayed and updated in the LOS website (www.leborthosoc.com). DT

Thank you for the interview and time Dr Mona. Looking forward to welcoming you in Dubai, 12-13 April 2019 for the 14th CAD/CAM & Digital Dentistry Conference.

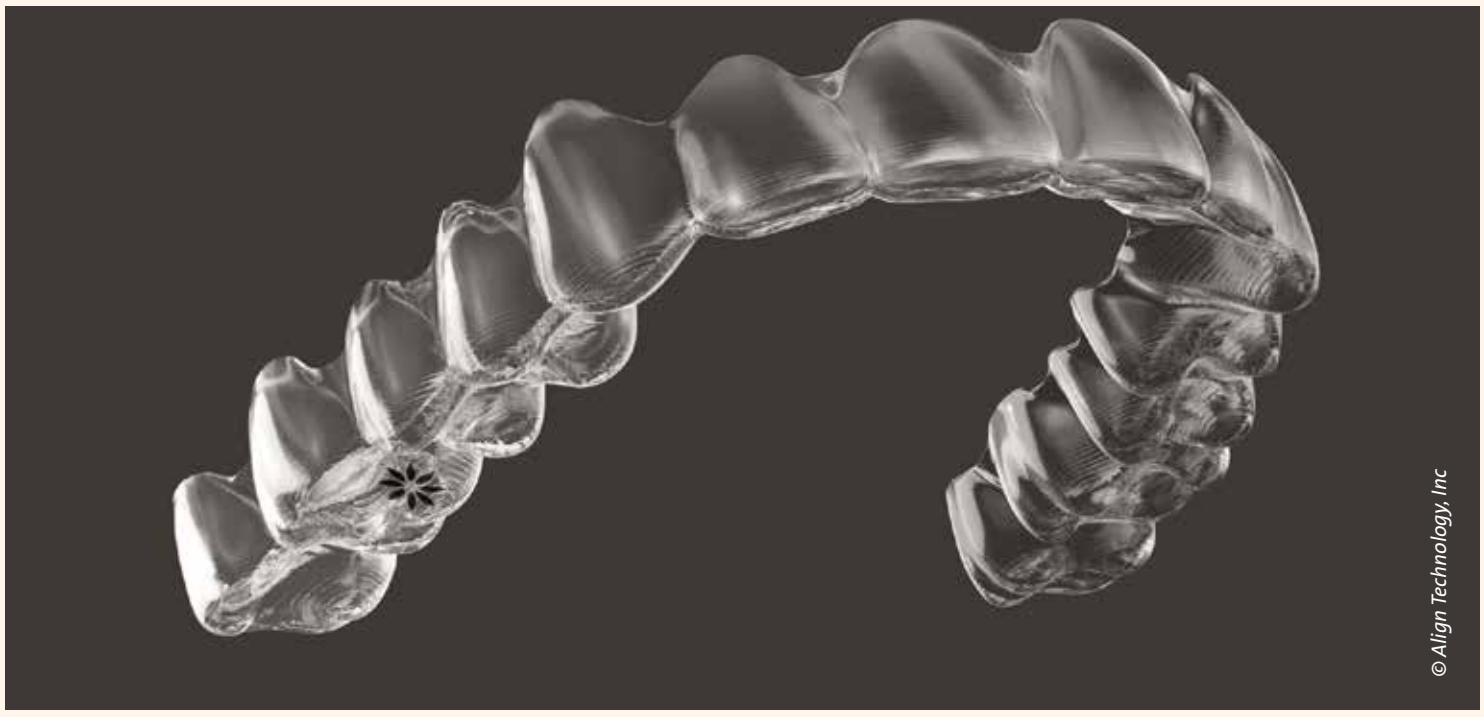
Align Technology supports saudi community by addressing dental issues of teens and younger patients

By Align Technology, Inc

JEDDAH, KSA: Align Technology, a global medical device company engaged in the design, manufacture and marketing of the Invisalign system, the most advanced clear aligner system in the world, and iTero intraoral scanners and services for orthodontic and restorative dentistry, will put a spotlight on teen and younger patient's oral care during 13th Annual Conference of the Saudi Orthodontic Society (SOS).

The leading dental event in the Middle East, taking place in Jeddah between February 21 – 24, will see dental professionals and industry leaders from across the region presenting key innovations and findings from the fields of orthodontics and dental health. Align Technology is one of the sponsors of this edition of the conference.

Align's focus on teen and younger patient's dental occlusion complements the focus of the Ministry of Health to strengthen dental practice in Saudi Arabia. It is estimated that the number of dental clinics will increase to more than 5,000 in the next two to three years amid increasing numbers of cases with malocclusion, reported among 6 to 12-year-olds. Further, independent research** in the Kingdom cites the prevalence of types of malocclusion among schoolchildren.



Align Technology presented its Invisalign Comprehensive Treatment with Mandibular Advancement feature, now approved by the Saudi Food & Drug Administration, and the future release of Invisalign First treatment at the 13th Annual Conference of the Saudi Orthodontic Society

During the event, Align Technology will be highlighting two of its orthodontic solutions – the Invisalign Comprehensive treatment with Mandibular Advancement feature, developed specifically for teenage patients, which has received regulatory clearance by the Saudi Food & Drug Administration (SFDA) and will be commercially available in the near future. Align will also present the future release of Invisalign First treatment for younger patients with early mixed dentition, typically 6 to 10 years of age.

The Kingdom of Saudi Arabia is an important market for Align. In order to provide Invisalign trained doctors with the best customer experience, the company has recently reduced the shipping time of its products to doctors in the Kingdom by as much 40 per cent, allowing doctors to serve their patients more quickly and efficiently.

The Invisalign Comprehensive Treatment with Mandibular Advancement feature can help address Class II type of malocclusion, more commonly known as an overbite, which is one of the leading reasons teenagers undergo an orthodontic treatment. With the Invisalign solution, the required corrective procedure – encouraging the lower jaw to move forward while straightening the teeth at the same time – can be done without the use of any traditional appliances.

The Invisalign Comprehensive treatment with Mandibular Advancement feature is manufactured using patented SmartTrack material and features precision wings that are situated between the premolars and first molars. As children bite down, the wings engage and hold the lower jaw (mandible) in a forward (advanced) position. This will lead to the jaw shifting incrementally forward to its proper place over time and the lower jaw growing into the appropriate size to match the upper jaw, thus overcoming the overbite problem. The aligners simultaneously move and level the teeth.

Invisalign aligners can be removed for eating and drinking, thus having no food restrictions, and since they are not fixed, they allow teens to brush and floss their teeth freely. They are also virtually invisible and may help them feel more confident.

Similarly, Invisalign First clear aligners are designed with features developed specifically for younger patients with early mixed dentition - a mixture of primary/baby and permanent teeth. They address a broad range of malocclusions, including shorter clinical crowns, management of erupting dentition, and predictable dental arch expansion. The early treatment will help prevent severe problems and alignment issues as the children grow.

Mawlid Chaoui, Align Technology, General Manager, Middle East and Africa, said: "We are delighted to extend our support to the SOS community and to highlight Invisalign orthodontic solutions that assist dental professionals in addressing as many as 80% annual orthodontic case starts, especially when treating dental malocclusions of teens and younger patients. Through our participation at the Conference, as well as our ongoing commitment to offering dental professionals advanced orthodontic solutions that help drive digitalization of orthodontics, we are proudly supporting Vision 2030 transformation, set forth by the Kingdom of Saudi Arabia, in which enhancing the wellbeing of the community is top priority." DT

For additional information about the Invisalign system or to find an Invisalign provider in your area, please visit www.invisalign.com.sa. For additional information about the iTero digital scanning system, please visit www.itero.com.

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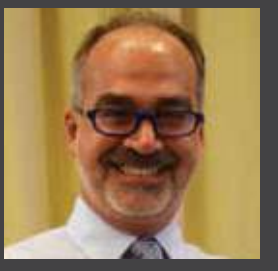

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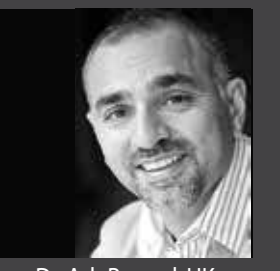

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Module 3 | 19-22 February 2020 | Prof. Paul Tipton & Prof. James Prichard & Dr. Adam Toft & Dr. Ashish Rayarel
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Module 4 | 08-11 April 2020 | Prof. Paul Tipton & Dr. Malcolm Riley & Dr. Adam Toft & Dr. Ashish Rayarel
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Module 5 | September 2020 | Prof. Paul Tipton & Dr. Adam Toft & Dr. Ashish Rayeral
Bridge Preparation Techniques | Articulator selection in Restorative Dentistry | Porcelain Inlays & Onlays | Veneer Cementation Techniques Practical

Module 6 | November 2020 | Prof. Paul Tipton & Mr. Gary Jenkinson & Dr. Adam Toft
The Art & Science of Aesthetic Dentistry Part 1 & Anterior Diagnostic Waxing | The Art & Science of Aesthetic Dentistry Part 2 & Posterior Diagnostic Waxing | TMD, It's Diagnosis and Treatment | Adhesive Bridge Preparation Techniques

Module 7 | February 2021 | Prof. Paul Tipton & Prof. Edward Lynch & Dr. Adam Nulty & Dr. Adam Toft & Dr. Ashish Rayeral
Minimally Invasive Dentistry | Digital Dentistry Workflow & Photography Principles, Hardware and Storage Part 1 & 2

Module 8 | May 2021 | Prof. Göran Urde & Dr. Timothy Eldridge & Dr. Adam Toft & Dr. Ashish Rayeral
Implant Prosthodontics Part 1 & 2 | Botox & Dermal Fillers – A Dental Facial Aesthetics Part 1 & 2

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CAPP

Dr. Carmem Pfeifer from the Oregon Health and Science University School of Dentistry has developed a doubly resistant filling material that may help reduce dental visits and prevent extensive treatment.

Researchers discover new material that could make dental fillings more durable

By Dental Tribune International

PORTLAND, Ore., U.S.: A recent study has found that a compound used to make car bumpers more robust and protect wood decks could make dental fillings last twice as long. The results of the investigation will help design fully formulated adhesives to be tested in clinically relevant conditions, and as a result, dental patients could reduce the number of visits to the dental office.

A team of researchers at the Oregon Health and Science University (OHSU) School of Dentistry in Portland has created a filling material that is twice as resistant to breakage than conventional fillings. The new filling uses the additive thiourethane, which can also be found in protective coatings for cars and wood decks.

The team has also developed an adhesive that proved to be three times stronger after six months in use than the adhesives that are currently used to keep fillings in place. Combined, the new adhesive and the composite are designed to make more enduring dental restorations.

"Today's dental restorations typically only last seven to ten years before they fail," said Dr. Carmem Pfeifer, an associate professor in the Department of Restorative Dentistry at the school and corresponding author of the studies. "They crack under the pressure of chewing, or have gaps form between the filling and the tooth, which allow bacteria to seep in and a new cavity to form," Pfeifer said. "Every time this happens, the tooth under the restorations becomes weaker and weaker, and what starts as a small cavity may end up with root canal damage, a lost tooth or even life-threatening infections," she continued.

The dental adhesive uses a type of polymer, known as (meth)acrylamide, that is much more resistant to damage in water, bacteria and enzymes in the mouth than the standard adhesives currently used in the dental industry. The composite material uses thiourethane, a chemical compound that can better withstand chewing.

The study describing the adhesive is titled "Use of (meth)acrylamides as alternative monomers in dental adhesive systems" and was published online in Dental Materials on Feb. 27, 2019, ahead of inclusion in an issue.

The study on the material is titled "Toughening of dental composites with thiourethane-modified filler interfaces" and was published online on Feb. 19, 2019, in Scientific Reports. DT

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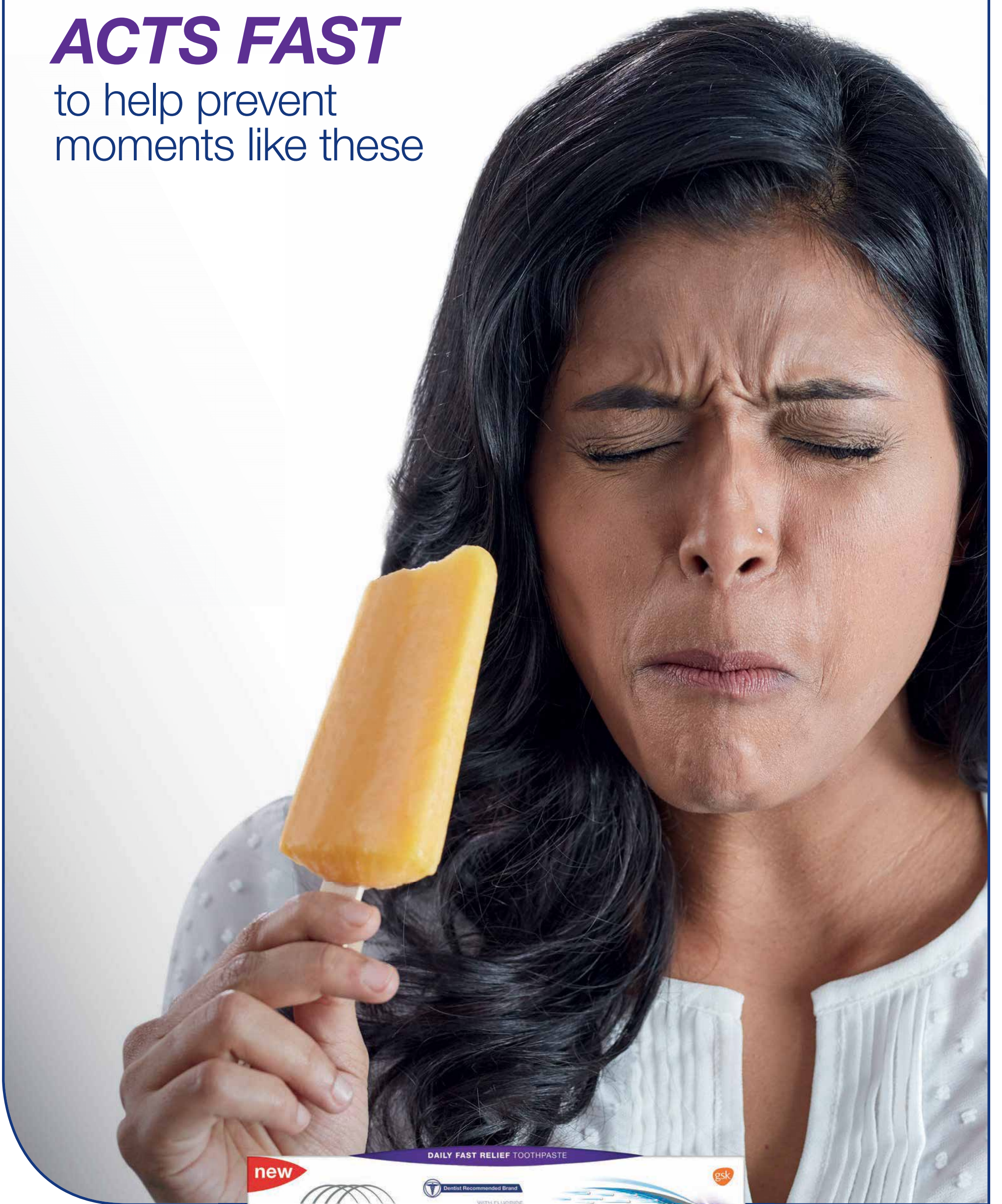

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Minimally invasive root canal shaping – A new protocol

By Dr Bogdan Moldoveanu, Romania

Minimally invasive—the most well-known oxymoron in dentistry—is probably nowadaysconsidered the new standard of care in almost every field of dental medicine, but more so in endodontics. Despite improved oral and dental health, the demand for endodontic treatment and restorations remains high among individuals with relatively complete dentition and dental awareness.[1] The need for adequate endodontic treatment is most likely one of the driving forces behind all the improvements that have reached practitioners in recent years. The use of nickel-titanium (NiTi) rotary files in root canal preparation is one of those improvements and has provided a reduction in the frequency of procedural errors and the time required for chemomechanical preparation in relation to manual files.[2]

Shaping is considered a crucial phase in root canal therapy because it not only is aimed at removing remaining pulp tissue, microorganisms and debris, but should also create the preconditions for effective irrigation and obturation.[1, 3, 4] These tasks should be accomplished without altering the diameter and position of the apical foramen or excessively weakening the root in any part. New instruments have been introduced every year, each claiming to be better than the previous one and having the ability to provide a better outcome. Regardless of any commercial interests, with regard to root canal shaping, from the aspect of the success of endodontic treatment, it is very important to maintain the original form of the canal as far as possible while the root canal is being gradually enlarged from the apical to the coronal region.[3]

The need for successful endodontics has probably set the stage for a new generation of rotary files, made with heat-treated NiTi. The various thermomechanical procedures and the improvement in composition of the alloy that is used in manufacturing NiTi files are aimed at improving the flexibility of NiTi files.[5–7] Improved flexibility of NiTi files would minimise the intracanal irregularities, such as canal transportation, and would ensure an increase in the success of root canal therapy.

One of the most well-known instruments when it comes to heat-treated rotary files are the HyFlex CM files (COLTENE). The controlled memory (CM) wire made with a thermally treated NiTi alloy, owing to the austenite/martensite transformation, has a stable martensitic microstructure at body temperature.[8] Therefore, the structure of HyFlex CM enables significant fatigue resistance, ease of bending and the ability to return to its original shape when heated above the transformation temperature.[9]

Recently, COLTENE has introduced a new type of file, the 20/05 EDM (the preparation file), which comes as a muchneeded addition to the already existing EDM shaping system. HyFlex EDM instruments (COLTENE) are manufactured using the technique of electrical discharge machining and are the first endodontic files to be made with this method.10 Electrical discharge machining can be used in manufacturing all types of conductive materials (e.g. metals, alloys, graphite and ceramics) of any hardness at high precision levels.11 This manufacturing process uses spark erosion to harden the surface of the NiTi file, resulting in superior fracture resistance and improved

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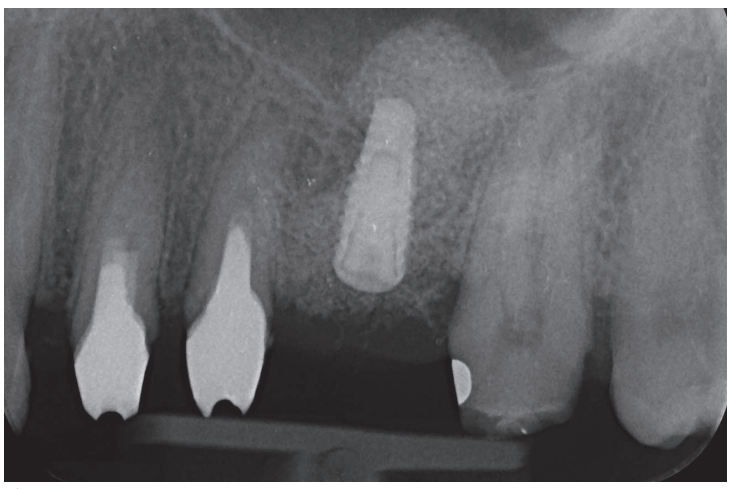

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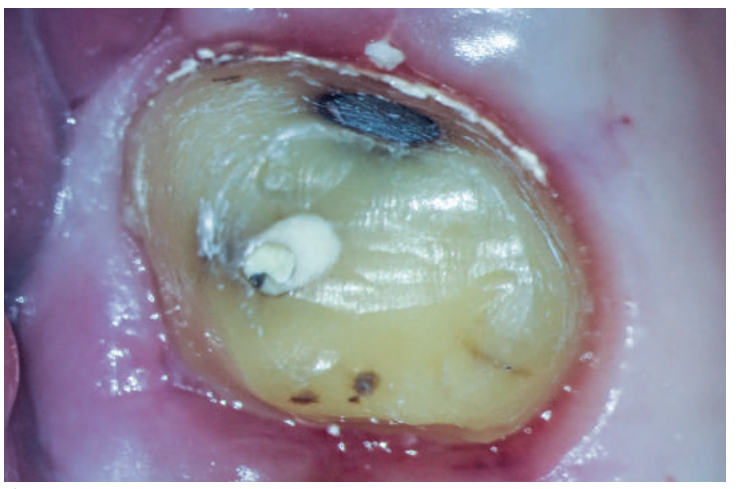

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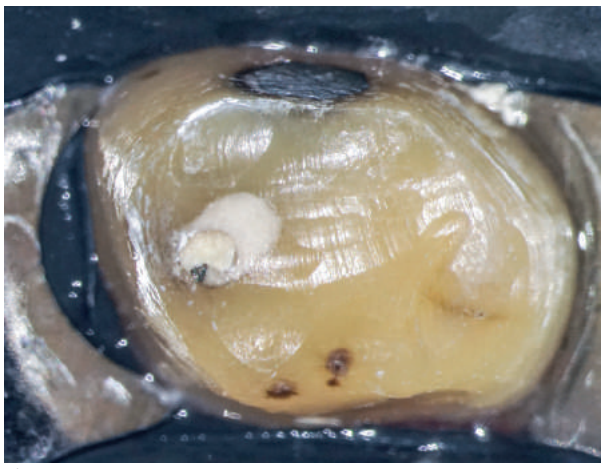

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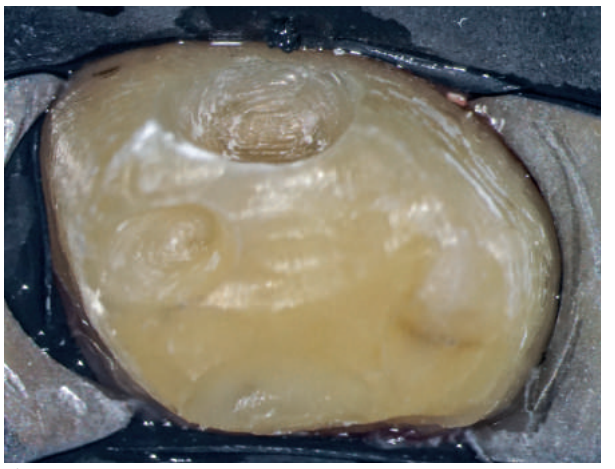

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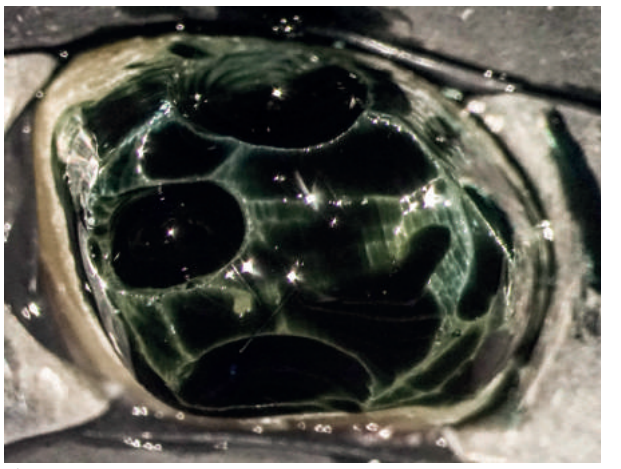

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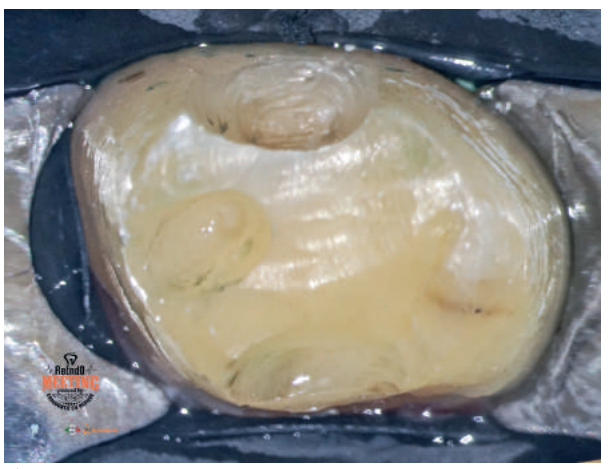

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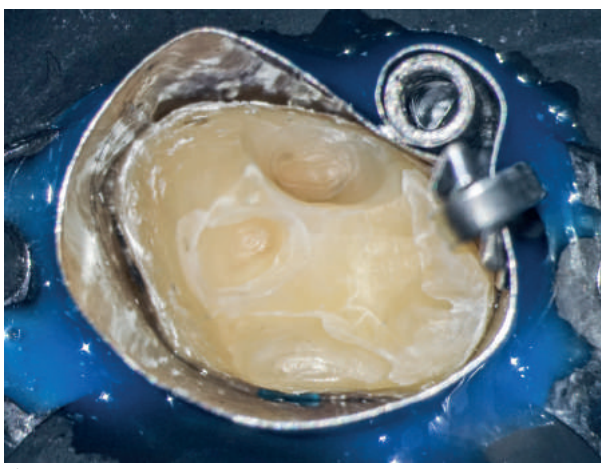

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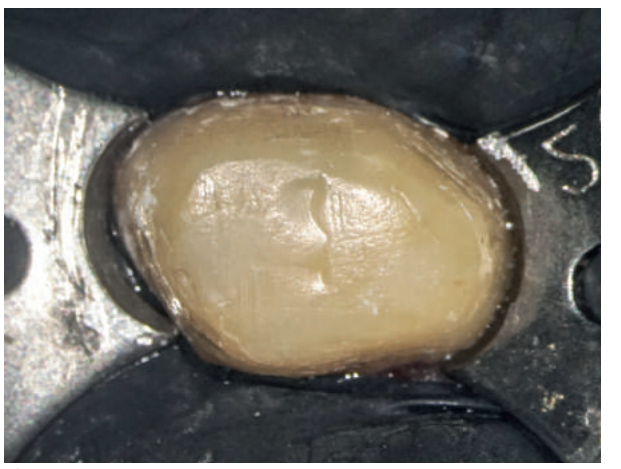

Fig. 8

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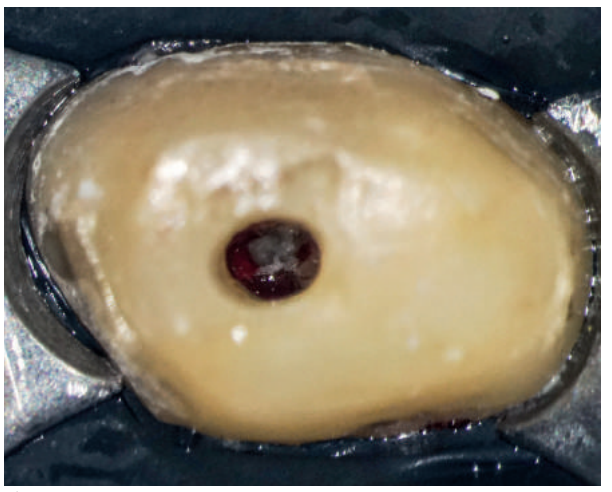
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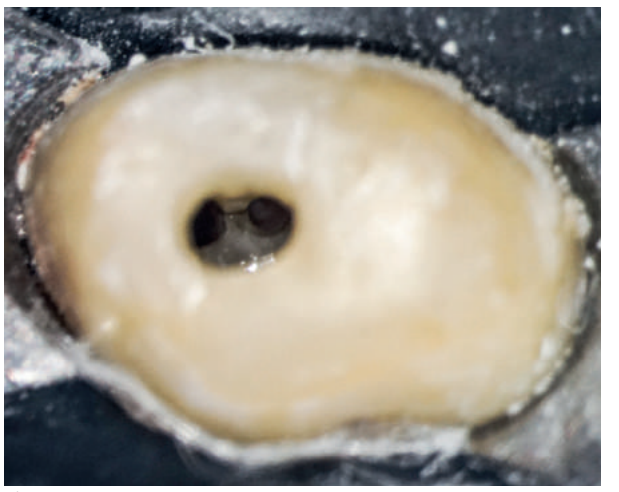
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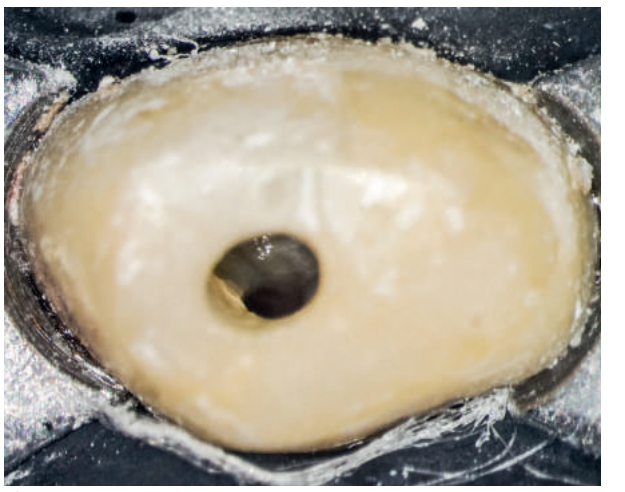
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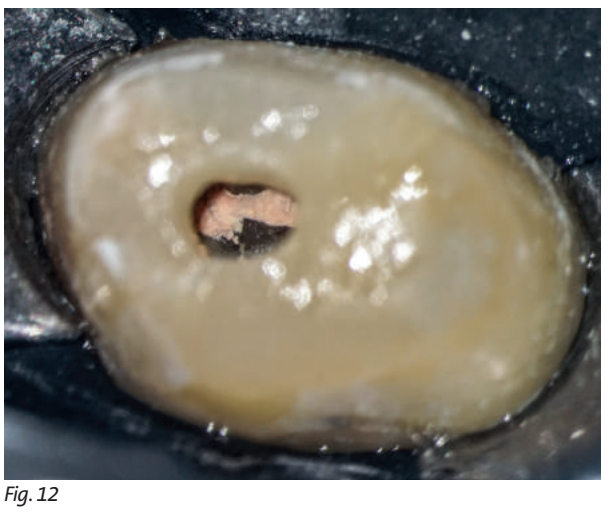
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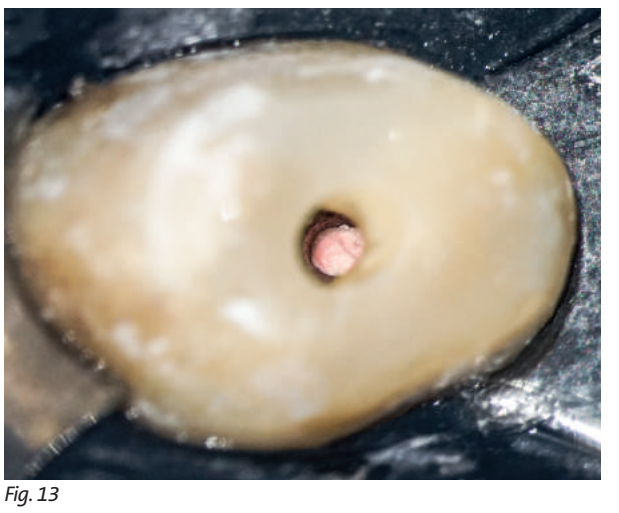
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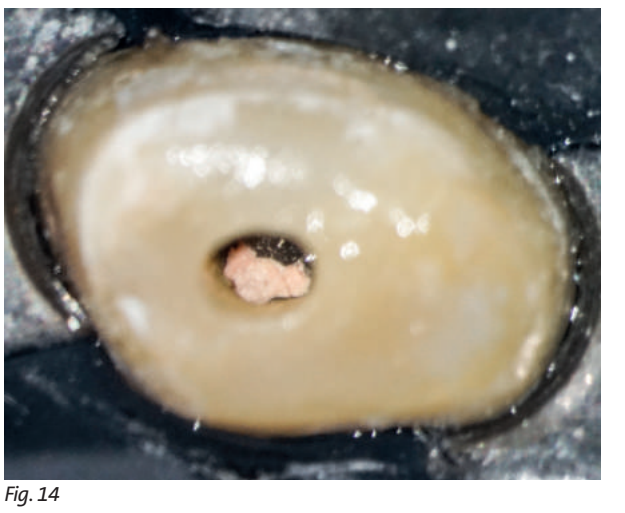
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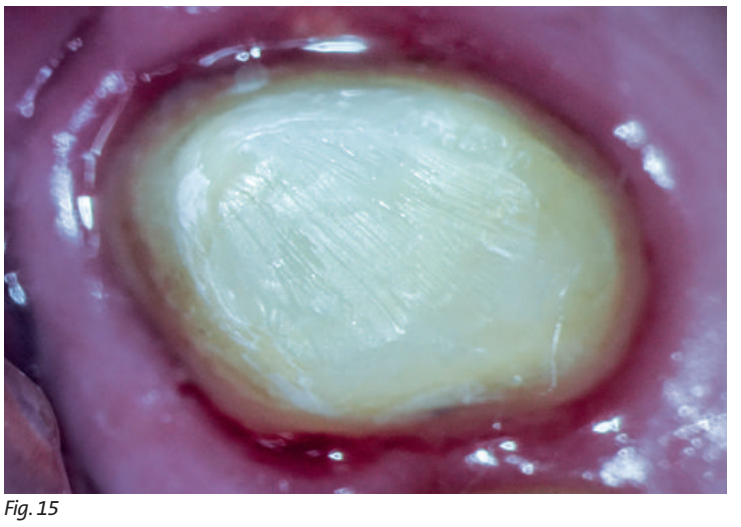
Fig. 15


Fig. 16

cutting efficiency. HyFlex EDM NiTi files are manufactured using CM alloy technology just like the HyFlex CM NiTi files. HyFlex EDM 25 has a taper that changes throughout the file shaft and a 0.25 mm apical diameter. Throughout the file shaft, HyFlex EDM 25 has three different cross sections: quadratic in the apical third, trapezoidal in the middle third and almost triangular in the coronal third.12 The other HyFlex EDM files (10/05 and 20/05) have a single taper of 0.05 throughout the working part.

The purpose of this case report is to present a new protocol that uses only three files in order to reach an optimum result, sacrificing a minimal amount of dental structure. One of the most important things that a clinician can focus on is being open-minded to question the paradigms of our profession. In time, some paradigms can become a false "standard of care" to those who blindly follow statements that are not supported by valid information. Adherence to some ideas promoted in the virtual or actual professional environment may ruin the balance of accurate knowledge, leading both clinicians and researchers to understand things solely from their perspective, for it seems evident to them that there is no other way to be. This is what we have come to know as the settlement of the paradigm.[14]

One of the most well-known paradigms in endodontics concerns the instrumentation of curved root canals, for which it is believed that the use of a #25 file in the apical portion fulfils all of the cleaning and shaping objectives of root canal therapy. The idea behind this theory is mostly centred around what can happen if one over-instruments the root canal. Failures such as deviations, perforations and zipping may have a higher rate of occurrence when one enlarges the apical diameter beyond a #25 file.[15–17] However, when one is treating a tooth exhibiting signs and symptoms of periapical periodontitis, further enlargement by hand files might be required, since it appears that the minimum instrumentation size needed for penetration of irrigants to the apical third of the root canal is a #30 file.[18]

Case report

The patient who is the focus of our discussion came to our office reporting intense pain in response to hot and cold stimuli in the left maxilla (Fig. 1). He described the pain as being spontaneous at times and that in order for it to subside administration of anti-inflammatory medication was required. Upon examination, an accurate diagnosis was established of symptomatic irreversible pulpitis affecting tooth #27. The patient had had the tooth prepared for a crown sometime in the last 60 days (Fig. 2), but unfortunately the treatment was not completed for unknown reasons. Caries seemed to be absent; therefore, a minimally invasive approach was planned. Most likely, the pathology was caused by either trauma or an iatrogenic event.

After isolation of the tooth (Fig. 3), an access cavity was created using high-speed diamond burs and ultrasonic tips (Figs. 4–8). Pre-flaring in the coronal and middle thirds was done with the HyFlex EDM 25 instrument (at a torque of 4 Ncm and a speed of 500 rpm). It is a proven fact that pre-flaring allows an increase in the instrument size that binds in the root canal, irrespective of the discrepancy between the size of the file and anatomical diameter.[19–21] Afterwards, canal scouting was performed using an ISO size 10 stainless-steel K-file up to working length. Upon establishing the working length, with the help of an apex locator, the 10/05 EDM file (glide path file) was used up to working length (at a torque of 3 Ncm and a speed of 300 rpm). Subsequently before finishing the preparation with the 25 EDM file, the 20/05 EDM (preparation file) was used to full working length (at a torque of 3 Ncm and a speed of 400 rpm). At this point, the working length was confirmed again with an ISO size 20 NiTi K-file. Root canal shaping was completed with the 25 EDM file, which was inserted to full working length (at a torque of 3 Ncm and a speed of 400 rpm; Figs. 9–12).

This recommended shaping protocol also has the benefit of extruding less debris outside the root canal, thus improving the patient's quality of life after the completion of the therapy. Dentinal and pulp tissue debris, microorganisms and irrigating solutions may extrude into periradicular tissue during the preparation of root canals,[22] thus causing complications such as postoperative pain, inflammation/infection and flare-up, and possibly delaying the healing process.[23]

The instruments in such an order are also very well suited for maintaining the anatomy of the root canals. The HyFlex EDM 25 file determines slightly less transportation at every level and in most cases stays a little more centred compared with other instruments available.[24]

Using the HyFlex EDM instruments as opposed to the HyFlex CM ones is no random choice. HyFlex CM files are manufactured via a grinding procedure. Grinding procedures during the production of NiTi files cause the formation of irregular areas, such as pits, fissures and metal folds.[25] Being subjected to huge flexural and torsional forces, the instruments need to be resistant and the surface of the file must not change throughout the therapy. According to a study by Uslu et al., the surface of used HyFlex EDM files was found to be statistically significantly rougher than that of used HyFlex CM files.[25] The surface properties of HyFlex EDM files, when compared with those of HyFlex CM files, were better retained after use for severely curved root canal preparation.

The sequence proposed in the present article is easy to use, easy to learn and highly versatile. One may adapt it to different cases, be it a severely curved mesial root of a mandibular molar or a highly calcified canal in a mandibular central incisor. Following several easy steps, but respecting the order in which the files must be used, success is just around the corner.

After chemomechanical treatment, the root canals were filled using a single-cone filling technique (ROEKO Guttapercha Points and ROEKO GuttaFlow bioseal, both COLTENE), and the access cavity was sealed using composite materials (Figs. 12–16).

Conclusion

Living in a world full of endodontic opportunities, it is important that the clinician use all the means available to provide the best quality of care for patients. Hopefully by applying this particular sequence in root canal therapy, the clinician can achieve the task more easily and in a much safer manner. DT

Editorial note: A list of references is available from the publisher.

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The influence of Glide Path preparation on the canal shaping times of WaveOne® Gold in curved mandibular molar canals


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By Martin Vorster, Peet J. van der Vyver, Farzana Paleker

Introduction

The aim of this study was to compare the glide path preparation times of stainless steel hand files, PathFile® (Dentsply Sirona), and the WaveOne® Gold Glider (Dentsply Sirona). The preparation times for final root canal shaping with the Primary WaveOne® Gold instrument in extracted human molar teeth with and without prior glide path preparation were also recorded and compared.

Methods

Mesiobuccal canals of 60 extracted human mandibular molars (curvature angles between 25° and 35° and radii <10 mm) were selected and randomly divided into 4 groups with 15 canals each. Canals were negotiated to patency with a #8 K-file. Canal preparations were performed by a single operator using precurved #10-15-20 stainless steel manual K-files (the K-file group), a #10 stainless steel manual K-file followed by PathFile®s #1-3 (the PathFile® group), a #10 stainless steel manual K-file followed by WaveOne® Gold Glider (the WaveOne® Gold Glider group), or no further glide path preparation. Final canal preparation of all 60 canals was performed with the Primary WaveOne® Gold instrument. Glide path and final preparation times were recorded.

Results

Glide path enlargement was statistically significantly fastest in the WaveOne® Gold Glider group (19.7 ± 5.6 seconds) followed by the PathFile® group (41.0 ± 6.8 seconds) and then the K-file group (81.2 ± 26.3 seconds) using analysis of variance (ANOVA) and Kruskal-Wallis tests (P < .0001). No statistically significant difference in the mean final preparation times was found among the WaveOne® Gold Glider (23.1 ± 6.0 seconds), PathFile® (24.4 ± 4.9 seconds), and K-file groups (27.2 ± 9.5 seconds). All 3 groups were statistically significantly faster than the no glide path preparation group (35.4 ± 10.2 seconds) using ANOVA (P = .0004) and Kruskal-Wallis tests (P = .0010).

Conclusions

Preparation time with the Primary WaveOne® Gold file was statistically significantly reduced when the file was used in combination with any of the glide path preparation techniques. The WaveOne® Gold Glider performed statistically significantly faster in glide path preparation time than the other glide path preparation techniques. DT

Editorial note:
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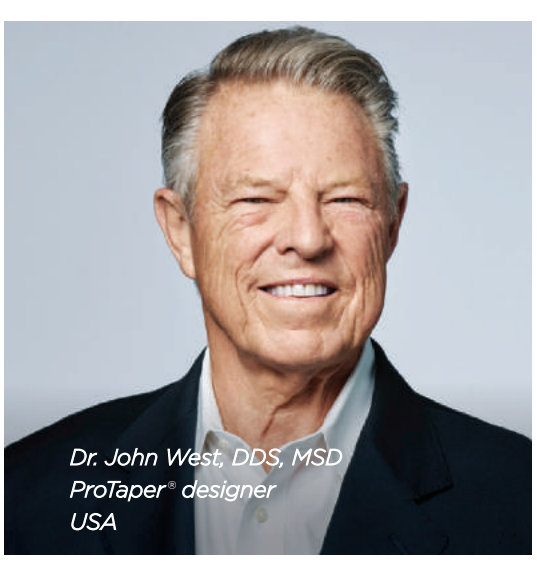

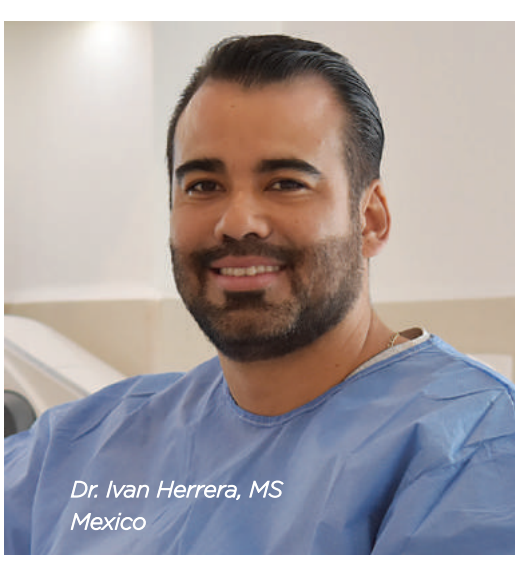

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Cherry on top in complete denture prosthetics: individuality and naturalness

Removable prosthetics as high-quality restorative treatment in the edentulous patient

By Erwin Eitler, Switzerland

Restorative treatment of the edentulous jaw requires, above all, sound knowledge of the function and statics of dental prosthetics. Customised pink-and-white aesthetics that match the expectation of the patient represent the "cherry on top" here, adding extra quality to the treatment.

We all know it, but let's say it again: The number of edentulous patients will increase sharply over the coming years due to ongoing changes in demographics. The older people grow, the larger the number of edentulous patients will become. Complete prosthetics will therefore remain of high relevance for both clinicians and technicians and should not be neglected neither in the education and training nor in the day-to-day work of dental professionals. Sound knowledge coupled with clinical and technical expertise are essential to achieve satisfactory results. Upfront, complete dentures for edentulous patients appear to hold little promise from an economic point of view. However, the writer of this report maintains that this is a question of perspective. Complete denture prosthetics is a supreme discipline that allows a customised approach for each individual patient. An appropriate treatment strategy can be selected from a range of processing techniques to meet the individual needs of the patient being treated. Accordingly, outcomes range form e.g. highly aesthetic, custom-made tooth replacements to "basic" complete dentures manufactured using a digital method. Whichever method is used, function and statics will always be at a high level. Any compromises in statics and function would not be acceptable.

Preoperative situation

The 75-year-old female patient presented with severe periodontal damage in the upper and lower jaw (Figs 1 and 2). The oral cavity was free of inflammation and looked well maintained. However, the periodontium had been irreversibly damaged by periodontal disease. The clinical diagnosis showed that the teeth in the upper jaw could no longer be preserved. Some of the lower teeth also had to be removed. However, the lower premolars and canines were still in a good enough condition to be used as anchors for a dental prosthesis. A conversation was held with the patient to discuss her expectations and treatment options. She wanted to have dentures that could give her stability. Most important of all, she wanted. to be able to chew normally again. She also described her difficulties in speaking and expressed her discomfort about her appearance. She wished to have a "beautiful" smile again and be able to speak without impediment. In addition, the dentures should be easy to clean and handle and they should be hard-wearing. Implant-based treatment measures were not an option, as she wanted to avoid any additional surgical intervention. It was therefore decided to restore the upper jaw with a complete denture and the lower jaw with a partial model cast denture.

Treatment planning

Crafting a tooth replacement for a family member is always a special task for a dental technician; especially if, as in this case, said family member was the technician's own grandma. This increases the challenge of a task that is already demanding (complete dentures). The goal was to create dentures that harmonize with the face of the patient in a naturally beautiful and discreet way. Functional and yet highly aesthetic dentures should be achieved.

Primary requirements of the patient on the dentures:
– Restored chewing function
– Improved phonetics
– Discreet integration of the dentures
– Individualized aesthetics
– Easy to clean

Figs: 1 and 2: Preoperative situation. The aesthetic and functional shortcomings are clearly visible on the baseline pictures.

Anterior teeth and setup in the oral cavity

First, the teeth in the upper and lower jaw that could no longer be preserved were extracted and the extraction wounds were allowed to heal. After that, impressions of the oral situation were taken. The diagnostic casts were used to establish the arrangement of the upper anterior teeth. For this task, high-quality prefabricated denture teeth (SR Vivodent® S PE) were used. These moulds provide impressive individualized aesthetics for the anterior region. The expressive texture and internal stratification of the teeth lend an age-appropriate natural liveliness to the dentures. In addition, the teeth are made of a material that meets the requirements for durability, consisting of highly cross-linked DCL (Double Cross Linked) polymer. According to the manufacturer, the DCL polymer is a modified polymethyl methacrylate variant that offers higher compressive strength and better durability than conventional PMMAs – while the material's flexibility is similar as that of conventional resins.

After the casts had been analysed, the teeth were set up according to the known parameters. Despite clearly defined aesthetic guidelines, it is crucial to check the setup on the patient and to adjust it as needed. The anterior setup was adjusted in the mouth of the patient to meet her individual aesthetic and phonetic requirements. The patient was instructed to perform various phonetic exercises and produce certain sounds so that her speech pattern could be observed. These observations were then used to adjust the arrangement of the teeth (Fig. 3). In this way, an ideal setup was achieved for the upper anterior tooth row.

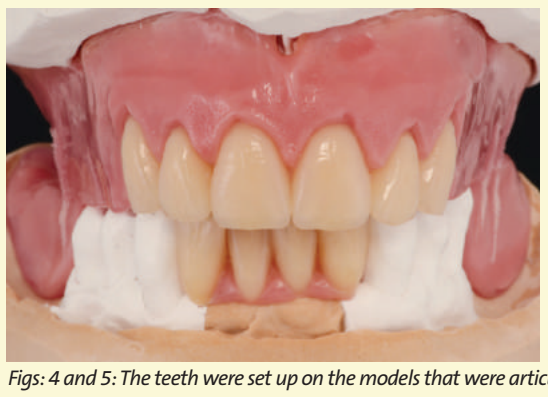
Tooth setup

Master models were created on the basis of a mucostatic impression of the upper jaw. The models were then mounted on the articulator in a centric relation in line with the bite registration. The four anterior teeth in the lower jaw were set up to match the setup established in the oral cavity (Figs 4 and 5). In an intermediate step, a posterior try-in was performed with the help of wax rims to check the bite height defined in the oral cavity. Posterior setup was then performed accordingly. The teeth were set up in a one-tooth-to-two-teeth relation taking all the principles of complete denture prosthetics into account. The SR Orthotyp® S PE posterior moulds are also made from DCL polymer. The beautifully shaped tooth necks of the anterior and posterior moulds, modelled on nature, merit particular mentioning here. They facilitate the aesthetic conversion into composite because the shape imitates the appearance of solid teeth growing from the "gums". A try-in of the setup in the oral cavity helped to verify the arrangement of the anterior teeth established in wax stage by stage.

Completing the dentures

A model cast framework was produced for the lower jaw. The den-

Figs: 3: The anterior setup was tried in and the phonetic and aesthetic details adjusted as required.



Figs: 4 and 5: The teeth were set up on the models that were articulated in line with the jaw relation.

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Fig: 6. The denture base was injection moulded and thenreduced to create space for creating soft tissue customisations.

Figs: 7 and 8. The completed upper denture distinguishes itself through its characterizations with gingival composite and phonetically aligned teeth.

Fig: 9. Model cast denture in the lower jaw with an open periodontal design (self-cleansing).

Figs: 10. Completed dentures on the upper and lower jaw models.

Figs: 11. Upper and lower dentures in situ. The customized pink and white esthetic effects make the dentures look very natural – the teeth look as though they have grown from the gums like natural teeth.

Figs: 12. Upper and lower dentures in situ. The customized pink and white esthetic effects make the dentures look very natural – the teeth look as though they have grown from the gums like natural teeth.

Figs: 13 and 14. View of the lips with inserted dentures in function.

tures are locked into place in the mouth with the help of six clasps. If the patient should lose another tooth, the denture can be easily extended. Special care was taken to ensure that the model cast framework featured an open periodontal design to facilitate self-cleansing.

The SR IvoBase® system was used for transferring the maxillary wax-up into resin – a system that couples efficiency with reliability. The injection procedure offsets the chemical shrinkage of the resin during polymerization. High-strength PMMA-based IvoBase was used for the manufacture of the denture base. The waxed-up dentures were invested and the sprues attached. After the moulds had been cast and the wax boiled out from the plaster, the flask and the denture teeth were prepared for the application of the denture base material with the injection moulding technique. The predosed denture base material was mixed and filled into the injector together with the flask. The appropriate program was selected and the injection process started. The accuracy of fit on the plaster model was ideal on the first try; reworking was minimal.

A try-in of the setup in the oral cavity helped to verify the arrangement of the anterior teeth established in wax stage by stage. The patient was able to speak and laugh without any difficulty. She was pleased with her new set of teeth already at this stage.

Customising the denture base

The denture base was reduced – similar to a cut-back – for individual veneering to make the dentures look as discreet and natural-looking as possible (Fig. 6). The soft tissue (pink) aesthetics of the denture base could now be designed with a variety of shades to resemble the natural gums. With its comprehensive range of gingiva shades, the light-curing SR Nexco® lab composite is well suited for reproducing soft tissue characteristics. The material is easy to process due to its exceptional properties. It is optimally matched to the IvoBase denture base materials.

Generally, key anatomical features should be borne in mind when characterizing soft tissue parts to achieve a lifelike reproduction. For instance, keratinized gingiva has a light pink colour because less blood normally flows through it. By contrast, the mucogingival areas receive a far larger supply of blood (dark red) and are interspersed with fine blood vessels. Given the versatile range of gingiva shades, SR Nexco offers abundant possibilities for creating customised characterizations in these cases. The interplay of convex and concave surfaces in the area of the alveoli and subtle stippling effects lend three-dimensionality and depth to the gingiva and these characteristics were reproduced with the help of the paste-like materials. Although they looked already very natural, the anterior teeth were additionally slightly customised using SR Nexco – a step that in this case was motivated by the high aesthetic ambitions of the dental technician (who, just to remind you, is the grandson of the patient). Step by step, the complete upper denture was given a natural look with the help of the light-curing lab composites. Final polymerization was followed by mechanical polishing (Figs 7 and 8). The model cast denture for the lower jaw was also completed (Figs 9 and 10).

The result

The patient was impressed with her new upper and lower dentures right away. Once inserted, their natural and highly aesthetic effect became even more apparent (Figs 11 and 12). This effect can be attributed, among other things, to the micro- and macro-texture of the anterior teeth and the vibrant interplay of shades between the teeth and gingiva. The harmonious interaction between the white and pink aesthetics is impressive. With the dentures in situ, the functional, aesthetic and phonetic parameters were again verified (Figs 13 and 14). The preliminary work was worth it. The dentures met all the requirements. The patient was happy and relieved that her grandson had mastered the double challenge so well.

In her own words, she discovered a whole new zest for life (Figs 15 and 16). Her tooth replacements offer her a much more satisfying situation than her own "old" teeth did in the past few years. Not only is she able to speak and eat again without impediment but she can also laugh again with all her heart. She has received positive feedback from her circle of friends and acquaintances and that has encouraged her even more. My grandma's quality of life has improved considerably and she feels much more positive about life. She is now interested in meeting up with friends again and become involved in the social life around her.

Summary

Processing technologies that enable restorative treatments customised to the needs of the individual patient are increasingly becoming established in complete denture prosthetics. For instance, digital methods allow the fabrication of solid"basic" dentures using relatively little effort. Alternatively, these basic applications can be supplemented with high-quality materials combined with – as cherry on top – a manual layering technique (gingiva) to create highly aesthetic results. Irrespective of economic aspects, the basic functional and static parameters always remain the same. Every complete denture ought to restore full functionality. Sound knowledge and experience in complete denture prosthetics provide the basis for achieving this. DT

Figs: 15 and 16. The patient with her dentures. New quality of life and stability

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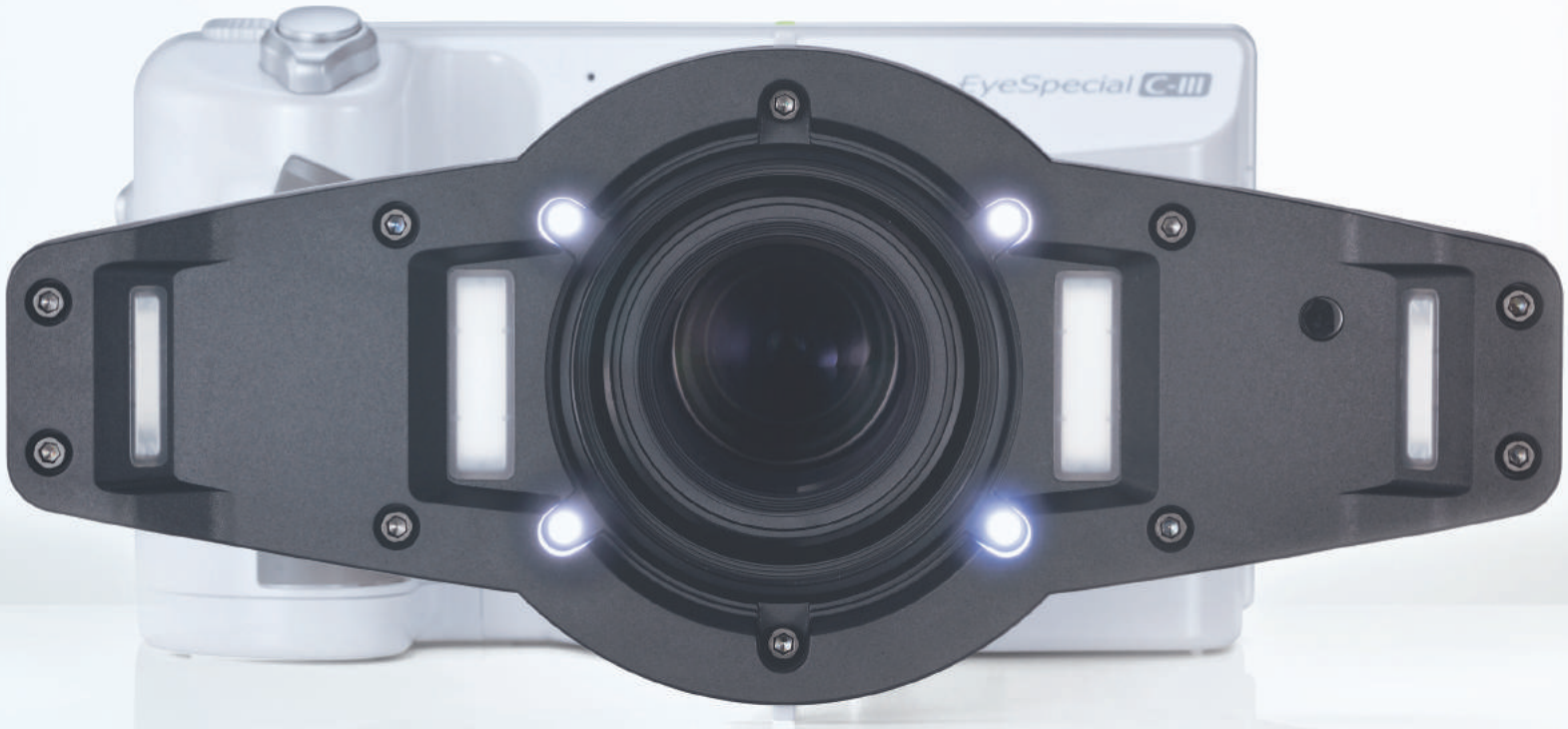

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Driving innovation forward

By Dentsply Sirona

As the Director of Research and Development at Dentsply Sirona Lab, Markus plays a central role in terms of our innovation pipeline. He is the person who drives new product developments, for example, innovative materials such as Celtra® Press.

Thanks to his expertise, great communication skills and inventive thinking, Markus understands our customers' needs and turns them into new and smart product ideas. His work philosophy reflects Dentsply Sirona's unique positioning by always laying out the whole picture of the workflow. He is working closely together with other Dentsply Sirona business units to generate valuable links to related workflows. This means that you can benefit from thought out end-to-end solutions, and subsequently benefit from tangible improvements in your daily work.

In this interview, Markus explains the various facets of his work as well as the secret behind real innovation.

Tell us a little about your role as Director of Research & Development? What are some of your daily endeavors and/or challenges?
A typical day for me is full of reviewing the statuses of all running product development projects, anticipating and identifying what obstacles or surprises (sometimes positive, sometimes negative) there are or might be, and how we can manage all of these things in order to either meet existing timelines and deadlines or to be able to start new projects which are fitting in the overall portfolio of the company.

For the development team, one needs an open ear to absorb every single surrounding detail, which includes being completely receptive and having a comprehensive, up-to-date understanding of our production, quality assurance, product management, and even logistic teams. In R&D you need constant curiosity, great communication skills and inventive thinking.

How does science, clinical studies, and research all fit under the Dentsply Sirona Lab name? Can you provide a little background on what goes into testing a product before it actually goes into development, and ultimately goes to market?
Due to the fact we are working in the medical devices market, we fulfill a great number of demands for testing and design control processes. For example, when developing a new material for dentistry we need to look at the biocompatibility as well as risk management starting from the production process, to the user, all the way to the end result — our patients. Besides proving and surpassing all requirements from applicable standards, we also want to know how our customers accept the workflow of the product. Before we launch, we take a close look at how it fits into the actual workflow of real-life dental laboratories, and we then start additional vigorous clinical testing after the launch as well. We include our customers quite early on in this process to allow us to react to their outcomes and feedback, and then be able to improve the product within the development timeline.

What makes Dentsply Sirona unique is that the entire workflow is shown, and it can be linked to other workflows and combined into an integrated solution.

When it comes to the prosthetic treatment of an implant using an abutment and full ceramic crown, for example, Dentsply Sirona Lab is the right partner for laboratories. But the treatment workflow as a whole starts from the earlier stage of diagnostics and the implantological treatment, and ends with the restoration finally being cemented or screwed in place. For this purpose, Dentsply Sirona and its Imaging, Implants, and Restorative business create integrated workflows for both dentists and dental laboratories.

One of your roles within Dentsply Sirona is to constantly provide material innovations that expand lab offerings to their dentist clients, while improving their workflow. How do you gather the information needed to improve upon these offerings?
We use groups of our core customers, labs and dentists. Sometimes the most effective feedback comes from our labs and dentists who are everyday partners because they know their ideal workflow routine, and are able to communicate their emerging concerns and ongoing daily challenges.

Can you tell us a little about Celtra® Press, the newest material for laboratories? What was the industry missing (doctor, labs, and patients) that this material now offers?
Celtra® Press has significantly improved the workflow in the lab by being easier to press (with excellent flowability) and excluding the time-consuming and dangerous use of hydrofluoric acid to get rid of the reaction layer. Despite this, it is stronger than other pressable high-strength glass-ceramic materials on the market. Therefore, Celtra® Press provides a simpler workflow in the lab, the dentist receives a robust material with a very good fit and easy polishability, and the patient absolutely loves the natural looking aesthetics and beauty of his or her new teeth.

What do you foresee Dentsply Sirona off ering in the near or distant future as far as material advancements?
We will soon present a new generation of CAD/CAM material, hand in hand with the lab material combining Celtra® Ceram porcelain that is suitable for every all ceramic case. We are also planning further material improvements on other material sectors coming very soon!

For more information about Dentsply Sirona Lab portfolio please contact your local representative

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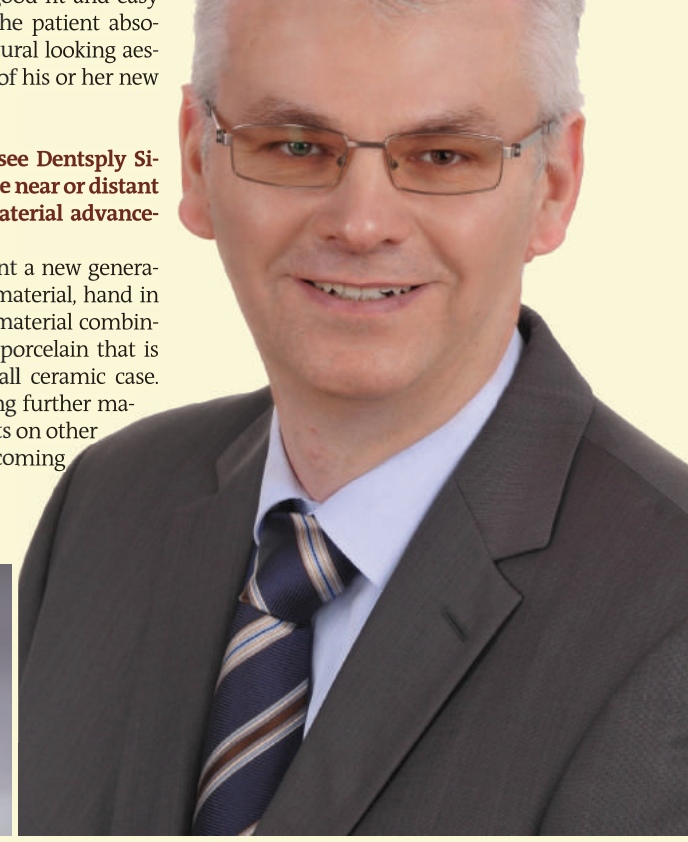

Interview: "We definitely passed a tipping point for 3-D printers"

By Brendan Day, DTI

Powered by 3D Systems' proprietary Figure 4 technology, the NextDent 5100 is a high-speed dental 3-D printer designed to save time for both patient and practitioner. Dental Tribune International spoke with Rik Jacobs, dental vice president and general manager at 3D Systems; Sebastiaan Cornelissen, CEO of Cordent and Core3dcentres; and Dr Michael Scherer, an American prosthodontist, about the NextDent 5100 and future trends in dentistry.

Is the NextDent 5100 designed specifically with the dental lab in mind, or can it be used in a dental practice as well?
Rik Jacobs: Essentially, I designed this product to be used by both labs and clinicians with success.

Sebastiaan Cornelissen: We found that the most important thing was to have a system that can incorporate multiple machines and multiple materials if necessary. This flexibility was the main feature that we were looking for, and the NextDent 5100 delivers this.

Dr Michael Scherer: For a clinician like myself, there's been an embrace of 3-D printing in recent years. However, it's always been the lower-cost models that have been prioritised. With the multiple materials and extremely fast printing that the NextDent 5100 offers, I think that clinicians can now offer a realistic chairside solution for patients.

What are the benefits of the NextDent 5100 for dental labs?
Cornelissen: In the dental lab, you have similar time pressure issues to a dental practice. You need to be able to produce things fast, in multiple colours and often in large quantities. To be frank, these are all easily achievable with this printer. Often, a dentist will send some scans to us so that we can quickly create a smile design for the dentist to print a mock-up of in his or her office. Though we are based in the Netherlands and have clinicians working with us from Germany, the NextDent 5100 allows for this entire procedure to be conducted in less than 2 hours.

What has the feedback been since the launch of this printer? What have customers most liked about it?
Jacobs: What was important for us, besides what these gentlemen have already mentioned, was that the printer have a high level of accuracy. With ten years of experience in the 3-D dental printing industry, I've learnt that a lot of printers work fine in the beginning but lose their accuracy over time. When 3D Systems acquired my company, we decided to make sure that our printer would work without issue, day in and day out, for at least three years. Flexibility, speed, accuracy and, ultimately, affordability of the machine and the materials—these, along with training and ongoing support from our outstanding resellers, are the foundations of the NextDent 5100.

We got a lot of feedback from users of this printer, like Michael and Sebastiaan, and thankfully, our R & D team in San Diego really listened to what they asked for, what the market asked for. I think this is what our company should always do: listen carefully to our customers and deliver what they need and want.

Are software updates included?
Jacobs: Automatically. As long as the user is connected to the Internet, he or she will be able to have the latest updates automatically downloaded to the printer.

It's predicted that, within three to five years, more than 50 per cent of dental labs globally will have an in-house 3-D printer. What, in your opinion, is driving this growth?
Jacobs: Well in 2018, we definitely passed a tipping point for 3-D printers here at 3D Systems. Thanks to easier registration, certification, improved ease of use, and a range of other factors, it has become much more achievable to integrate a 3-D printer into one's daily workflow.

Scherer: Clinicians are now expecting dental labs to be digital and to have printing capabilities. It's no longer a case of whether a lab will take your files, but rather if they print themselves or still outsource it. That's how fast 3-D printing has grown in dentistry. DT

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Interview: World Oral Health Day with FDI President Dr Kathryn Kell

By Dental Tribune MEA/CAPPmea

Dr. Kathryn Kell, FDI president, talks to Dental Tribune MEA/CAPPmea about the importance of oral health.

FDI President Dr. Kathryn Kell at the Philips booth at the dental trade show in Dubsi, UAE

Tell me about the work FDI does and the World Oral Health Day program you run.

FDI World Dental Federation (FDI) is an international not-for-profit, membership-based organization that serves as the principal representative body for more than 1 million dentists worldwide; we are active in close to 200 National Dental Associations (NDAs) and specialist groups in 130 countries. Founded in 1900, FDI is a pioneer in the field of modern dentistry. FDI has a bold vision: to lead the world to optimal oral health. Speaking as the unified voice of dentistry, we collaborate closely with our members, oral health experts, allied health professionals, and industry partners alike to achieve this vision together.

We are very proud of our World Oral Health Day campaign, which is a platform for the public, the oral health community, and policymakers to help reduce the global burden of oral disease. Everyone has the power to take action to reduce the impact of oral diseases on individuals, families and communities. WOHD provides the ideal platform to grow awareness and encourage people to take charge of their oral health. By working together and coordinating efforts at local, national, and global levels, we can amplify the voice of the oral health community every year on 20 March.

Why is oral health an important topic beyond the teeth and mouth of an individual?

Oral health is much more than a beautiful smile – it is an essential part of our well-being. The mouth is a kind of 'mirror' to the body and reflects the status of our overall health.

A look into our mouths can reveal nutritional deficiencies, signs of serious diseases, and the effects of unhealthy habits like tobacco or alcohol use. World Oral Health Day encourages all of us to protect our mouths and bodies by adopting good hygiene habits; eating a healthy diet that is low in sugar and high in fruits and vegetables; quitting tobacco use and avoiding harmful alcohol consumption.

What results did World Oral Health Day achieve over the past few years?

We are impressed by the increasingly global reach of World Oral Health Day. In 2018, 161,159 participants in 544 events around the world celebrated on 20 March. 150 countries engaged in events and activities. Here's a snapshot of the diversity of World Oral Health Day activities around the world: children's education programmes, lectures, workshops, rallies, free dental check-ups, brush-a-thons, media outreach, social media promotion and more. The response in the media, including on social media, was staggering: in 2018, our campaign reached close to 800 million people.

What is your anticipation for World Oral Health Day in 2019?

This year, World Oral Health Day is all about action on oral health at every level. The campaign will promote good oral hygiene habits and the importance of adopting a healthy diet and lifestyle; it will also highlight the link between oral diseases and other noncommunicable diseases such as diabetes, cardiovascular disease, respiratory disease and some cancers. The 2019 campaign theme, "Say Ahh: Act on Mouth Health" is filled with oral health messages and tips for good oral care that children and adults can take home and integrate into their daily self-care routines and share with their families and friends. Our campaign also urges oral health professionals to teach their patients how good oral health affects overall health; what's more, it calls on policymakers to analyze the oral health challenges in their countries and implement policies that address oral disease at a local, regional and national level.

Why are partnerships with companies like Philips important to FDI and how do such organizations support World Oral Health Day?

As you know, the dental profession and the dental industry are essential partners in delivering oral health to populations around the world. Bridging the gap between the two is even more important today, as new materials and technologies are developed to accommodate the latest treatment philosophies. As leaders in the corporate world, companies like Philips have access to an international community of diverse stakeholders; by working together, we can promote oral health on a truly global scale. Since 2016, Philips Sonicare has played an integral role in ensuring the success of World Oral Health Day through global and local activations. In the UAE, Philips collaborated with several stakeholders such as Dubai, Health Authority, universities and schools to raise awareness on oral hygiene. By continuing to unite our efforts, we can help make oral diseases a priority health issue and lead the world to optimal oral health. DT

Interview: "You are not healthy without good oral health"

By Dental Tribune MEA/CAPPmea

text under photo

Could you please give us a short introduction of yourself and the organisation?

I am Kathryn Kell and I am the President of FDI World Dental Federation. We are based in Geneva, Switzerland and in the organisation, we represent over a million dentists worldwide. We have around 200 members and we have about 130 members that are membership organisations. For example, I am a member of the American Dental Association—they are a member of FDI. The United Arab Emirates is a member of FDI. Those are the membership organisations, but then, in addition, we have other international organisations as affiliate and supporting members that are also very involved with us.

For instance, the International Association of Dental Research, the American Dental Education Association and several honorary member organisations, such as the International College of Dentists, the Academy of Dentistry International and the Pierre Fauchard Academy are some of our other members. We really have a great international group of people in our organisation.

I have been involved with FDI myself for many years. At one stage, I was the Chair of the Congress and Education Committee, which was why I was previously in Dubai at the last couple of meetings. So, I am rather familiar with this meeting and it is really great to be back here again and see the changes.

Can you tell us a little bit about how you are partnering with the industry? You mentioned it now, 3M is also a partner. Previously—I remember last year—we also partnered with other industry players. How important is that for you and what is the scale that you use to evaluate who should be the partner and how to grow the partnership?

W we say "partners" we really are partners, because without our partners we would not be able to do anything, really. As a dentist myself, in my office, if I do not have equipment and if I do not have the right materials, I am not going to be able to practice. It is the same thing with FDI if we do not have a commitment to each other. And that is what we look for: really strong programmes where we can work together. At 3M, we had "Smile Around the World" with 3M and we had a really great, successful project in China last year. So, now we are looking forward to doing more.

And you are also doing that in India and Brazil, right?

Yes, that was also in the past project.

What about here in the Middle East?

In the Middle East, we actually need to start developing some programmes. We have a Middle East Education Committee and we have a person who is based in Lebanon actually, Wunir Dumed, who puts on educational programmes around the Middle East and North Africa.

Could you share a little bit about the vision you have, 2020? What is that all about?

Vision 2020 is our advocacy programme. Again, we have advocacy for our members, but we also advocate for oral health around the world and we do this by working with the World Health Organisation and other United Nations agencies. I recently did a presentation in CIOSP in São Paulo, Brazil a few days ago on the Minamata convention. Basically, people are looking at what other materials we are going to be using in the future. We know the future are composites, glass ionomers and some things we are looking for you to still develop. We are very excited about some of the new things that we know you are going to be coming out with in the next few years, too.

We went to the 3M headquarters in the Minneapolis St Paul area and we talked to their research team about some of the things that they can do to help develop materials that can be used in countries where even their water supply is limited—you cannot really use the water—they do not have air, they do not have the tools required to do effective glass ionomers in composites. I think if we all work together and look at how we can develop new materials that will really work in some of these countries, that would help us in the long run.

And for the region now, one of the main goals, especially for the UAE and the Dubai Health Authority, is to get rid of caries. Caries prevention is a big goal. How do you see FDI working with those kinds of entities? Have you already begun doing some activities with them through world oral health care?

World oral health is one of the things we do at Prevention, but I cannot stress enough how prevention is the key, because if we do not have caries and if we do not have periodontal disease to deal with, then we are in. Then we do not have oral cancer and the things that go along with oral cancer, such as tobacco and alcohol consumption. Then you know you are going to prevent all these other problems from happening. I think, if anything, FDI stresses prevention.

And this year, in March, can we expect anything special here for World Oral Health Day?

I am actually going to be back in Cairo on March 20th to celebrate World Oral Health Day. I will be there, and we are looking forward to having a big celebration in Cairo. The Egyptian Dental Association and the Egyptian Dental Senate are working hard to put something exciting together for us.

Along with Vision 2020, we have a new definition of "oral health", but we have spoken about that before. Now, we are in our next stages: we are going to look at measurement tools, we are going to do surveys and the surveys are going to be global surveys, so that we can actually see what type of dental diseases are out there and which countries have more issues with caries, for example. Whereas other countries may have more issues with periodontal disease. This way we can actually get a focus on where we want to go with our vision. And then, eventually, we will develop projects that will be the next step.

How can companies or individuals, who are not directly involved in the World Oral Health day, participate? How is that something that we can begin?

We really hope that everyone—all companies in our industry—would like to join us and be a part of this initiative. They can certainly do that. Companies can help celebrate with some of their dental organisations. So, there is a way to get involved.

Is there anything else you would like to share with our listeners—the readers of the Middle East dental community?

Our vision is to lead the world to optimal oral health and that is what we want to do. It would be a big thing if the people in the Middle East can work with their governments to put together good programmes that would benefit the public.

We really want to bring oral health into all of healthcare, all of healthcare policies and anything you can do to bring oral health care into the health arena, in policies, in your governments. This can be very helpful. "You are not healthy without good oral health"—that is another message we want to convey. DT

Dental Tribune MEA speaking with Dr Kathryn Kell, the President of FDI World Dental Federation

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Combined, EMS AIRFLOW PLUS powder and the EMS AIRFLOW Prophylaxis Master delivera unique, one-of-a-kind, clinically proven, evidence-based solution to peri-implantitis and more

By E.M.S.

One of the true standout dental products launched at the biennial International Dental Show in Germany in 2017 is the EMS AIRFLOW Prophylaxis Master air polishing system and with it, the crystallisation of a much-needed solution to keeping implants and perio pockets clean. In the last 18 months, the EMS AIRFLOW brand has taken the world by storm.

Suddenly, specialists, dentists and dental hygienists and therapists have a single go-to solution for implant maintenance and pocket regeneration. As well as prophylaxis, EMS AIRFLOW is even replacing more invasive, technique-sensitive procedures like root planing. Apart from the slick, retro look and cutting edge Swiss engineering of the EMS AIRFLOW Prophylaxis Master air polishing system, the real key to its success is a symbiotic relationship with EMS AIRFLOW PLUS powder. Based on Erythritol, the patented micro-sized particles of EMS AIRFLOW PLUS have been clinically proven as highly effective time and again at removing biofilm without damage to implant or tissue.

An unexpected benefit for EMS of the micro-sized particles of AIRFLOW PLUS means that only an EMS air polisher unit can dispense the powder. Trying to use AIRFLOW PLUS with a non-EMS air polisher is nothing short of problematic, resulting, for instance, in over-dispensing of powder and clogging.

Periodontists and hygienists using the air polishing system have likened it to anyone that had a PC and thought it was the same as a Mac. Like a Mac, once you try the AIRFLOW solution, you immediately understand the difference.

AIRFLOW PLUS powder was developed in-house by EMS. We were eager to know more, so we spoke with Marcel Donnet, the EMS Powder Technology Research Group Leader in Nyon, Switzerland and posed the five most common questions dental professionals ask about EMS PLUS powder.

Figs: The EMS AIRFLOW Prophylaxis Master and AIRFLOW PLUS powder.

Marcel, firstly what is a powder engineer and what led you to this role at EMS?

We come in contact with powders on a regular basis, never the wiser.

Upon closer inspection, we will realise that powders are very complex and its behavior is neither like a solid nor a liquid (despite it, in fact, being a solid). As a result, making a powder is actually complex.

A specific university tract does not exist for powder engineers; one must pursue a combined educational plan consisting of chemical and material engineering. I received my Bachelor's degree in chemical engineering; I then pursued a Master's degree and finally attained my PhD from a material science department which had a laboratory working exclusively with powders.

Whilst conducting my doctorate studies, I had the opportunity to complete a lot of high-end research on powders.

This placed me in the perfect position to one day work at EMS: here we have to master the powder from the production to the mouth of the patient!

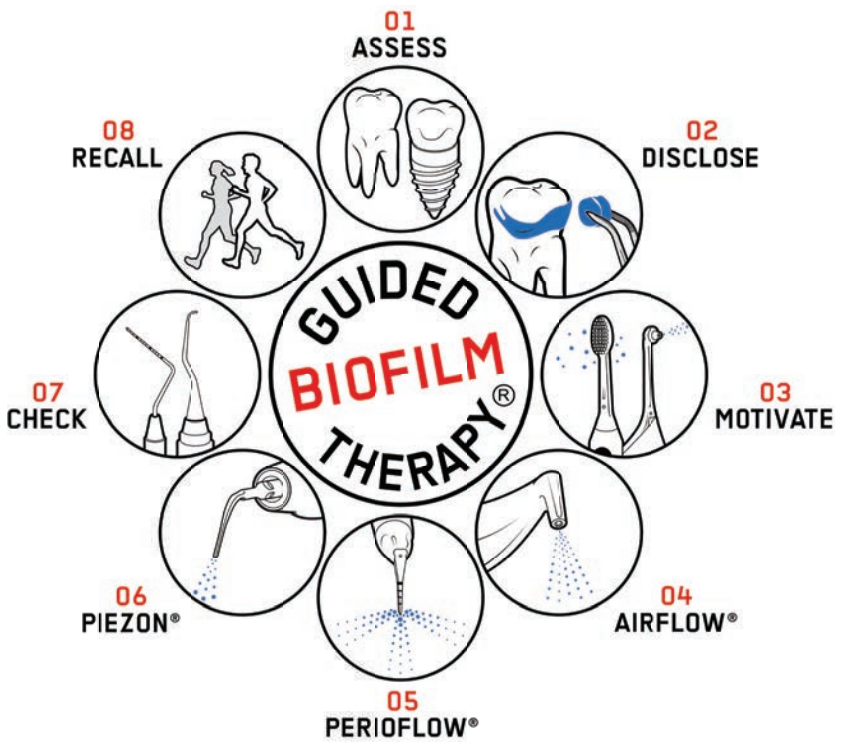

Fig. The Guided Biofilm Therapy protocol.

Air polishing has always just been seen as a hygiene product for stain removal and we've all heard stories of salty and gritty tasting powders.

What are some of the recent advances in prophylaxis powders?

When I joined EMS in 2005, air polishing did not rank highly in terms of non-cosmetic usage. Today, AIRFLOW is the new trend, the product of the future, and most in our industry attempt to imitate it. The shift came about, because we undertook advanced research. This research allowed the development of new applications, better understanding of past issues and highlighted the advantages powders offer.

For example, the first advancement made was EMS AIRFLOW PERIO powder, which was less abrasive than previous powders and therefore allowed a fully new application: cleaning biofilm in shallow pockets. This turned the powder from being cosmetic to becoming a treatment solution for the periodontist. This was a huge paradigm shift!

Due to this success, we developed the EMS PERIOFLOW nozzle, which allows you to easily clean biofilm inside deep pockets. Treating deep pockets became another success story thanks to its efficiency, especially in terms of treatment time and patient comfort. The shift from solely cosmetic application to an important and effective tool for patient care was complete. This paradigm shift was formally recognised when EMS received the PLURADENT innovation prize in 2007. The prize is significant because it's based on user questionnaires at dental trade shows over a full year. It's the voice of thousands of end users.

From there, our innovative journey progressed and led to the new EMS AIRFLOW PLUS powder, which combines the advantages of a supragingival and subgingival powder in one.

The EMS AIRFLOW PLUS powder is unique and patented. However, it was only part of the success story. This unique, fine powder required a bespoke delivery system, the AIRFLOW Prophylaxis Master. The EMS AIRFLOW Prophylaxis Master was launched in Australia last year and is the "enabler" of GUIDED BIOFILM THERAPY [GBT], the systematic, evidence-based solution for dental biofilm management developed by EMS. GBT refers to the clinical protocol for selectively removing the biofilm that forms on hard structures of the mouth, such as teeth, restorations and removable appliances including dentures, using a colour disclosing technique to assist, so as to maintain and promote good oral, gum and teeth health over time.

How did you come up with the idea of using Erythritol as an ingredient for the AIRFLOW PLUS powder and what else distinguishes AIRFLOW PLUS powder from other powders on the market?

Innovation requires constant change and improvement. Developing a new product takes time and today, we're developing the new products of tomorrow.

When one new product finally comes on the market, we're already working on the next generation. Based on this philosophy, when we released AIRFLOW PERIO powder, we were already searching for a new powder with hopefully even better characteristics. This research led us to the group of materials known as "polyol", which are non-sugar sweeteners. From this group, Erythritol was chosen because the powders are chemically stable and do not cause a reaction with the body. In addition, it is impervious to humidity and tastes good. The powder has been optimised by means of various tests: we revealed that this material has low abrasivity, allowing subgingival usage, but also high efficiency, making it ideal for supragingival usage. So in the end, this material in the form that we are manufacturing it has unique balanced properties with low abrasivity and high efficiency. Therefore, AIRFLOW PLUS is the only powder you need for more than 90% of clinical cases. It really is a universal powder.

There are concerns that air polishing powders can damage soft tissues and implant surfaces. Is the AIRFLOW PLUS powder safe to use on all surfaces?

The question of powder damaging different dental materials is one of our main research focuses. We strive to offer the safest and the most efficient method for removing biofilm to our end users, hence the advent of Guided Biofilm Therapy (GBT). The GBT protocol is a scientifically validated method which instructs professionals on how to properly perform prophylaxis using our powders and devices.

We left no stone unturned. Guided Biofilm Therapy calls for the clinician to:

1. Assess the current health of the patient's teeth;
2. Disclose biofilm with a disclosing agent as it is the only guaranteed way to see existing biofilm;
3. Motivate patients by showing them their dental biofilm;
4. AIRFLOW the gingiva, tongue, palate and supra and subgingivally up to 4mm;
5. PERIOFLOW pockets sized 4-9mm;
6. PIEZON pockets 9-10mm;
7. Check to ensure all biofilm is removed and accurately diagnose caries; and
8. Recall patients for continued oral and overall health.

These steps ensure the safety of patients, implant surfaces and soft tissues.

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IMPLANT TRIBUNE

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Digitalisation of the gold standard of implantology

By Cortex

Over two decades ago, digitalisation started to transform dentistry, but the process has not been accomplished yet. We are currently in a hybrid phase, in which digital and conventional procedures are often combined. In 2018, Cortex's fully digital system assumed its place in the digital dentistry world. The system provides the clinician with a complete digital workflow, from virtual implant planning to the final restoration.

Virtual implant planning, static guided surgery, dynamic freehand navigation systems and other CAD/CAM technologies have been undergoing a drastic evolution in the last few years.

The decision on whether to use a digital or a conventional procedure is highly dependent on the clinician's individual preferences, and no recommendations can be made based on the present consensus.

For example, a septum case was solved using a combination of the virtual implant planning software Implant Studio (3Shape) and Cortex's guided surgery kit that helps achieve correct placement of Cortex's Magix dental implant, the design of which acts as a bone expander and allows for minimum bone drilling.

After clinical and radiographic examination, a virtual diagnostic impression and a CBCT scan were taken. The digital files were imported into computer-guided planning software and perfectly merged. The case was planned remote from the treatment place in the digital laboratory at the Cortex headquarters. After one week, the surgical template was received.

Placement of a Magix implant for the mandibular first molar was virtually planned for the septum site. The ideal position of the implant was virtually planned based on the anatomical architecture and prosthetic considerations. The angulation and vertical position of the implant were determined to minimise axial loading of the implant and create a proper emergence profile. A 3-D printed surgical template from a rapid prototyping machine was designed and fabricated for the surgery. The drilling osteotomy and implant placement process were smooth and precise, and the results were as planned.

As clinical cases in dentistry can vary greatly and have individual nuances, digital implantology allows for pre-diagnosis and pre-prepared optimal surgical workflow planning, avoiding unexpected challenges during the surgical execution.

It offers a number of benefits to the clinician as well as the patient. For some clinicians, it reduces the procedural time and offers more secure implant placement in complex cases. More importantly, it provides a link between the virtual prosthetically driven treatment plan and the actual surgery by transferring the simulated intervention accurately to the surgical site with the use of an individual surgical template, made specifically for each case. This approach provides the planner with prosthetically driven planning in order to assure an optimal final restorative result. DT

Incorporating CAD/CAM solutions for full-mouth dental implant reconstructions

By Dr Ara Nazarian, USA

Patients facing the loss of their natural dentition have more treatment options than ever before. The traditional complete denture, once the standard of care for the fully edentulous patient, is slowly but surely giving way to fixed full-arch implant restorations as their superior stability, function and aesthetics become more well known. Further, prosthetic materials have advanced in leaps and bounds, and monolithic zirconia can now be milled for fixed full-arch indications. By moving beyond acrylic and its vulnerability to wear, chipping, stains and fracture, this adds long-term durability to the qualities that make the fixed implant prosthesis the ultimate restorative option for fully edentulous cases.

Owing to the versatility of dental CAD/CAM technology and the material properties of monolithic zirconia, high-strength restorations can be fabricated for the fully edentulous patient in various configurations. For example, because of its flexural strength of up to 1,465MPa, BruxZir Solid Zirconia (Glidewell Laboratories) can be milled into thin layers and maintain the high level of durability for which the material has become known. This allows for the fabrication of restorations ranging from the monolithic zirconia full-arch implant prosthesis, which resembles a screw-retained hybrid denture in form, to cementable prostheses that attach to custom abutments in the manner of traditional crown and bridge work.

While the screw-retained monolithic zirconia full-arch implant restoration has grown increasingly popular in recent years, the cementable alternative is well suited for many patients. When sufficient hard and soft tissue are present, prostheses can be designed that emerge directly from the gingiva, creating the aesthetics and feel of natural dentition. Additionally, the use of custom abutments to support a cementable full-arch bridge allows for low-profile restorations with minimal faciolingual width. This is appealing to many patients and can indicate a fixed solution in cases of limited vertical clearance.

Cementable monolithic zirconia implant prostheses can be fabricated in various designs as described by Dr Carl Misch's prosthodontic classifications.[1] While they are most commonly indicated in fixed prosthesis (FP) 1 and 2 cases, in which the prosthetic teeth rise from the gingivae like natural teeth, they can also be used in FP3 cases, where the monolithic prosthesis includes pink gingival areas in order to reconstitute the soft tissue.[1] Whichever prosthesis type is indicated, the precision of dental CAD/CAM technology and versatility of full-contour zirconia allow the entire restoration to be milled from a sin- gle block of the material, adding to the overall strength.

All of these prosthesis types afford bone preservation, improved dental function, psychological benefits and enhanced quality of life associated with fixed implant prostheses, which come the closest to natural dentition of all restorative options.[2,3]

The use of custom abutments for this type of restoration—and all cementable prostheses for that matter— is essential, as it allows for the creation of margins that are gingival or just slightly subgingival, enhancing crown retention, cervical soft-tissue margins and the final emergence profile.[4,5] The precision and flexibility in prosthetic positioning allowed for by custom abutments also make it easier to achieve a passive fit for the restoration and correct for divergent angulation of implants.

The following case report features a full-mouth reconstruction via cementable full-arch BruxZir bridges over Inclusive Titanium Custom Abutments (Glidewell Laboratories). The treatment protocol for this type of restoration will be illustrated, as well as the general parameters for determining whether this solution is indicated for the individual patient. Standard denture technique, digital treatment planning and CAD/CAM technology were used to achieve an excellent result in an aesthetically challenging case.


Fig. 1: Pre-op retracted view.


Fig. 2: Pre-op retracted view without denture.

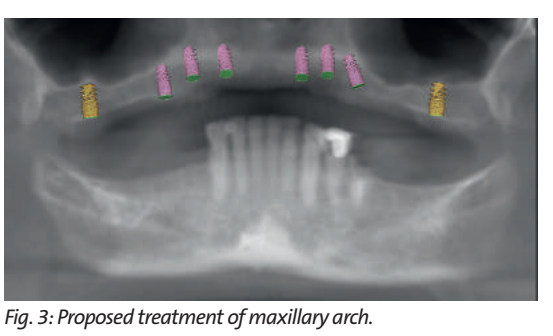
Fig. 3: Proposed treatment of maxillary arch.

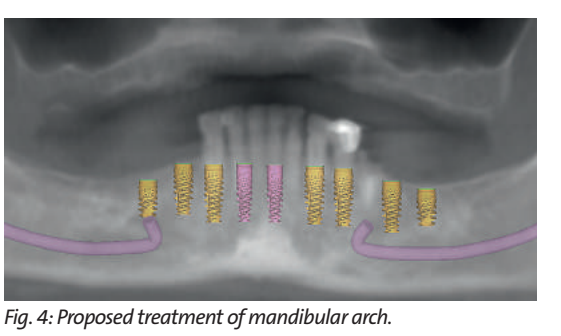
Fig. 4: Proposed treatment of mandibular arch.

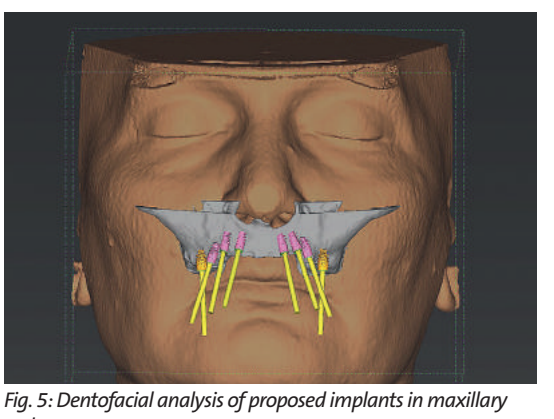
Fig. 5: Dentofacial analysis of proposed implants in maxillary arch.

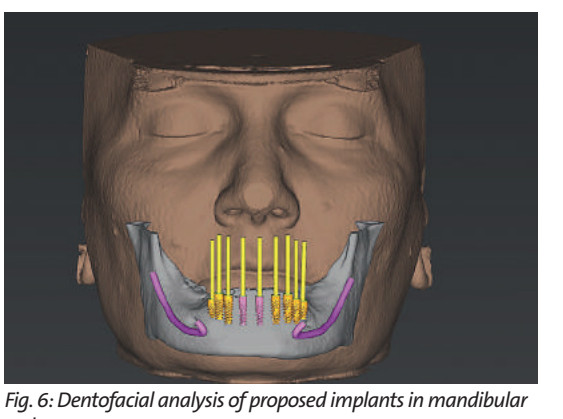
Fig. 6: Dentofacial analysis of proposed implants in mandibular arch.

Case presentation

A female patient in her mid-fifties presented for treatment with an edentulous maxilla and grossly decayed, hyper-erupted mandibular dentition (Figs. 1&2). The patient was a heavy smoker, had not seen a dentist in several years, and was not taking proper care of her re- maining teeth owing to pain and discomfort. The patient's maxillary denture had become increasingly loose-fitting since losing her teeth nearly a decade prior. Her desire for a restoration that felt and functioned more like natural teeth led her to my practice, where she could undergo the surgical and prosthetic phases of treatment under one roof. Intra-oral and

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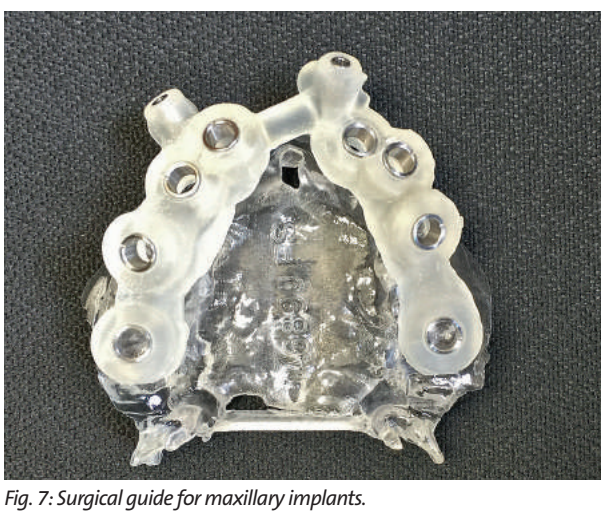
Fig. 7: Surgical guide for maxillary implants.

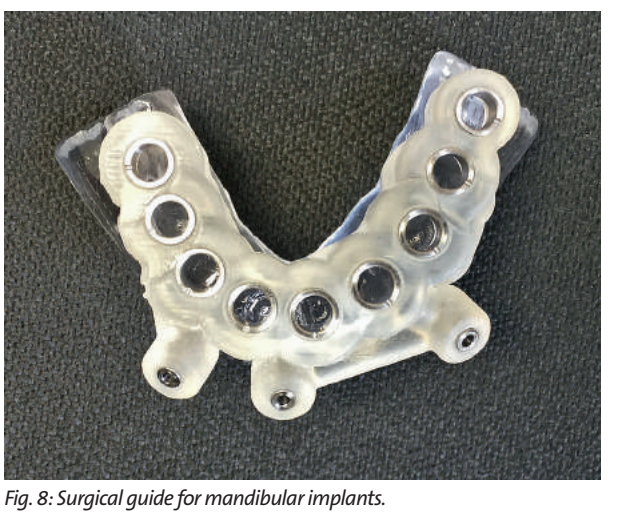
Fig. 8: Surgical guide for mandibular implants.

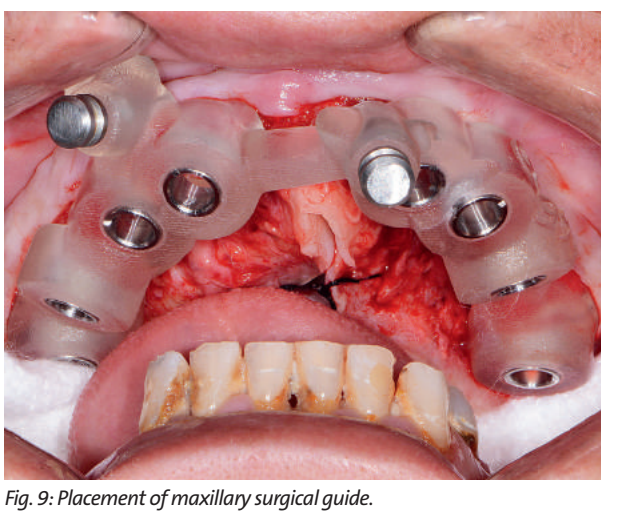
Fig. 9: Placement of maxillary surgical guide.

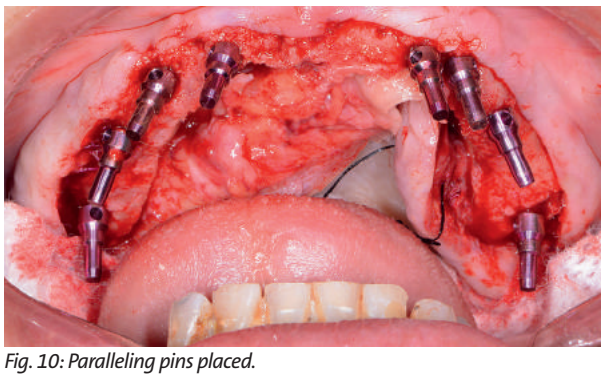
Fig. 10: Paralleling pins placed.

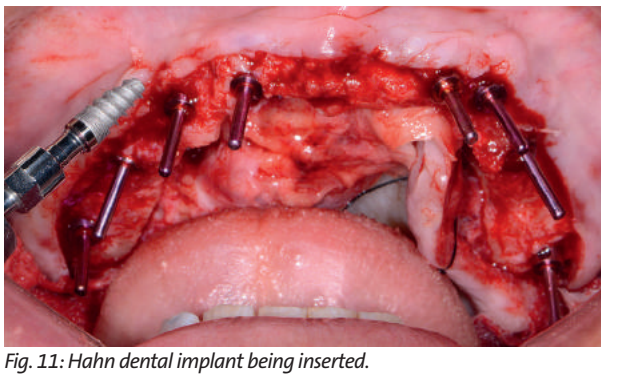
Fig. 11: Hahn dental implant being inserted.

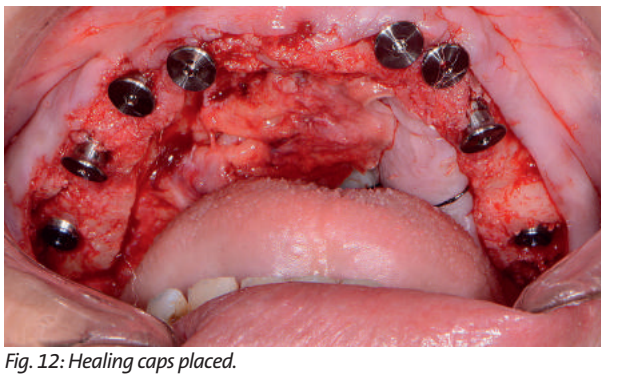
Fig. 12: Healing caps placed.

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Fig. 13: Mandibular arch anaesthetised.

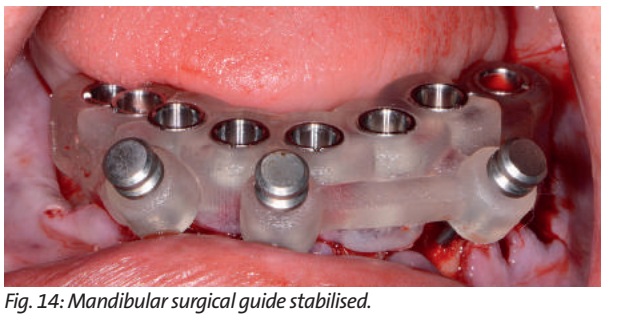
Fig. 14: Mandibular surgical guide stabilised.

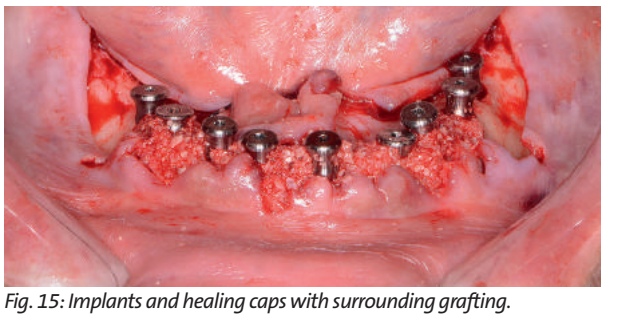
Fig. 15: Implants and healing caps with surrounding grafting.


Fig. 16: Im- mediate dentures with soft relining.

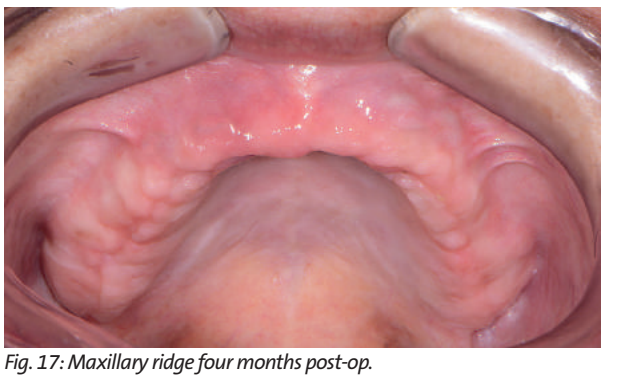
Fig. 17: Maxillary ridge four months post-op.


Fig. 18: Mandibular ridge four months post-op.

radiographic evaluation indicated sufficient bone volume for full-arch implant therapy.

Treatment options were presented to the patient for her edentulous upper arch and non-restorable mandibular dentition, including various combinations of fixed and removable implant prostheses. This involved a discussion of complete edentulism and its problems, consequences and solutions, the effect of tooth loss on oral health, and the differences in stability and function afforded by each treatment option. Dental financing programmes were explained, which is an important part of treatment presentation, as it can help make implant therapy feasible for patients who cannot cover the entire cost upfront.

The patient strongly desired fixed restorations, as she had grown quite frustrated with her removable maxillary denture over the years. In addition, the patient had a pronounced gag reflex, making the fixed option optimal because it would free up the palate. An FP 3 prosthesis was required for the patient's maxillary arch, which had undergone substantial bone resorption and gingival recession. The tissue contours would also need to be recreated in the mandible, where bone levelling was required to remove undercuts, create an ideal occlusal table, properly seat a bone-supported surgical guide and establish adequate bone width in which to place the implants.

The anatomy of the patient's ridges called for a cementable solution, as the labiolingual bone volume required that several of the implants be tilted in a manner that would have required access holes too far to the facial aspect if screw-retained prostheses were to be prescribed. This would have been especially problematic for this patient, as cigarette smoking tends to darken the composite used to seal the screw access holes. The patient also desired prostheses that occupied as little faciopalatal space as possible, further indicating a cementable solution. Thus, custom abutments would be utilised to correct the angulation of the implants and support full-arch BruxZir restorations. The monolithic construction of the FP3 prosthesis, in which both the gingival areas and teeth are milled from the same block of solid zirconia, would ensure the longest-lasting restoration possible.

The patient returned for the records appointment, where maxillary and mandibular impressions were taken so that immediate temporary dentures could be fabricated for delivery at the surgical appointment. CBCT scanning was performed using a CS 8100 3D scanner (Carestream Dental) to provide the information needed for virtual treatment planning. The 3-D data obtained from the CBCT scans was used to determine the ideal length, width and placement of the implants in the key positions of the patient's edentulous arches, including the first molar, first premolar, canine and central incisor regions (Figs. 3–6). From the digital treatment plan cre- ated by 3D Diagnostix, bone-level surgical guides were produced for the maxilla and mandible (Figs. 7 & 8).

The Hahn Tapered Implant (The Hahn Tapered Implant System) was selected for the procedure because the pronounced thread design would help achieve optimal positioning and primary stability. The tapered shape and wide range of sizes also simplified the task of situating the implants in the key positions around the arch. Its conical internal hex connection results in a very stable seal between the implant and prosthesis, which is beneficial for crestal bone preservation and soft-tissue health.[3]

At the surgical appointment, intravenous sedation was administered to the patient. The bone-level surgical guide was seated over the patient's maxilla once the tis- sue had been reflected, and the fixation pins were tightened (Fig. 9). The implant osteotomies were created following the simplified surgical protocol of the Hahn Tapered Implant System. Eight implants were placed from second molar to second molar in the maxillary arch (Figs. 10&11). Healing abutments were connected to the implants to help prepare the soft tissue for the restorative phase (Fig. 12).

Next, the patient's untreatable mandibular teeth (Fig. 13) were extracted using the Physics Forceps (GoldenDent), a flap was reflected, and an alveoloplasty was performed. A bone-supported guide was seated in order to control the location and angulation of the implant osteotomies (Fig. 14). As the Hahn Tapered Implants were threaded into place, their deep, sharp threads engaged the walls of the socket sites and helped maintain proper position toward the lingual aspect. Because of anticipated tissue swelling as a result of the bone levelling procedure, 5mm high healing abutments were connected to the implants in the lower arch (Fig. 15). The immediate dentures were soft-relined with Mucopren (Kettenbach) to seat over the Hahn Tapered Implant Healing Abutments, the hourglass shape and undercuts of which provided a degree of retention that enhanced dental function for the patient during healing (Fig. 16).

Four months later (Figs. 17 & 18), the healing abutments in the maxillary arch were surgically exposed and the tissue appropriately approximated and allowed to heal. Approximately two to three weeks later, Hahn Tapered Implant Impression Copings were seated and closed-tray impressions taken with a polyvinylsiloxane material (Panasil, Kettenbach), as was a bite registration (Futar, Kettenbach). Because the immediate dentures were well fitting and satisfactory to the patient, duplicates were provided to the laboratory to aid the restoration design process.

Based on the impressions, the laboratory poured and scanned stone models, creating a digital representation of the patient's arches on which the designs for custom abutments and the cementable restoration were created. Inclusive Titanium Custom Abutments were fabricated with corresponding PMMA Smile Composers.

The patient returned for clinical evaluation of the prosthetic design. The custom abutments were delivered us- ing laboratory-provided acrylic delivery jigs, which helped ensure proper orientation during seating (Fig. 19). Owing to the precision of the digital design process, the fit of the custom abutments was ideal, establishing margins that were at or a slight distance from the gingival surface. This simplified the removal of excess cement from the margins and illustrates the advantages of CAD/CAM–produced abutments.

The PMMA Smile Composers were seated over the custom abutments, and slight alterations were made to fine-tune the gingival margins, length of teeth, and bite (Fig. 20). A bite registration was taken with the try-in bridges in place.

The PMMA Smile Composers were returned to the laboratory along with photographs, the bite registration and instructions for minor modifications, including lowering the gingival margins of the mandibular prosthesis and raising the gingival margins of the maxillary prosthesis. The laboratory scanned the adjusted PMMA try-in bridges, made the requested alterations to the prosthetic designs, and milled the final prostheses from BruxZir Solid Zirconia.

The final restoration was delivered at the next appointment and established accurate fit, function and interocclusal relationship (Figs. 21&22). No adjustments were needed for the monolithic zirconia prostheses because of the PMMA try-in process, which captured the precise modifications needed for proper form and aesthetics. Final radiography confirmed complete seating of the BruxZir restoration on the Inclusive Custom Implant Abutments. The patient was extremely happy with the reconstruction of her maxillary and mandibular arches, which restored aesthetics, dental function, comfort and confidence.

Conclusion

The accuracy of dental CAD/CAM technology and the versatility of prosthetic materials allow practitioners considerable flexibility in restoring the edentulous arch. For clinicians who prefer a cementable solution or cases in which bone anatomy precludes a screw-retained prosthesis, the monolithic zirconia restoration over custom abutments excels in restoring the teeth, as well as the hard and soft tissue of the fully edentulous patient. DT

Editorial note:
A list of references can be obtained from the publisher.

This article was originally published in CAD/CAM international magazine for digital dentistry, Issue 1/2018.


Fig. 19: Inclusive CAD/CAM abutments.

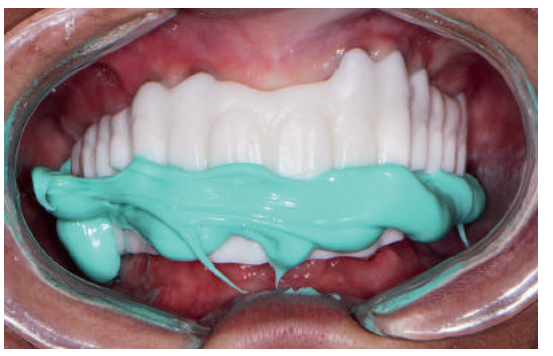
Fig. 20: PMMA Smile Composer.


Fig. 21: Post-op retracted open-bite view.


Fig. 22: Post-op retracted closed- bite view.

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 and the founder and Chief Clinical Officer of the Ascend Dental Academy. He has conducted lectures and hands-on workshops on aesthetic materials, grafting and dental implants throughout the US, Europe, New Zealand and Australia.

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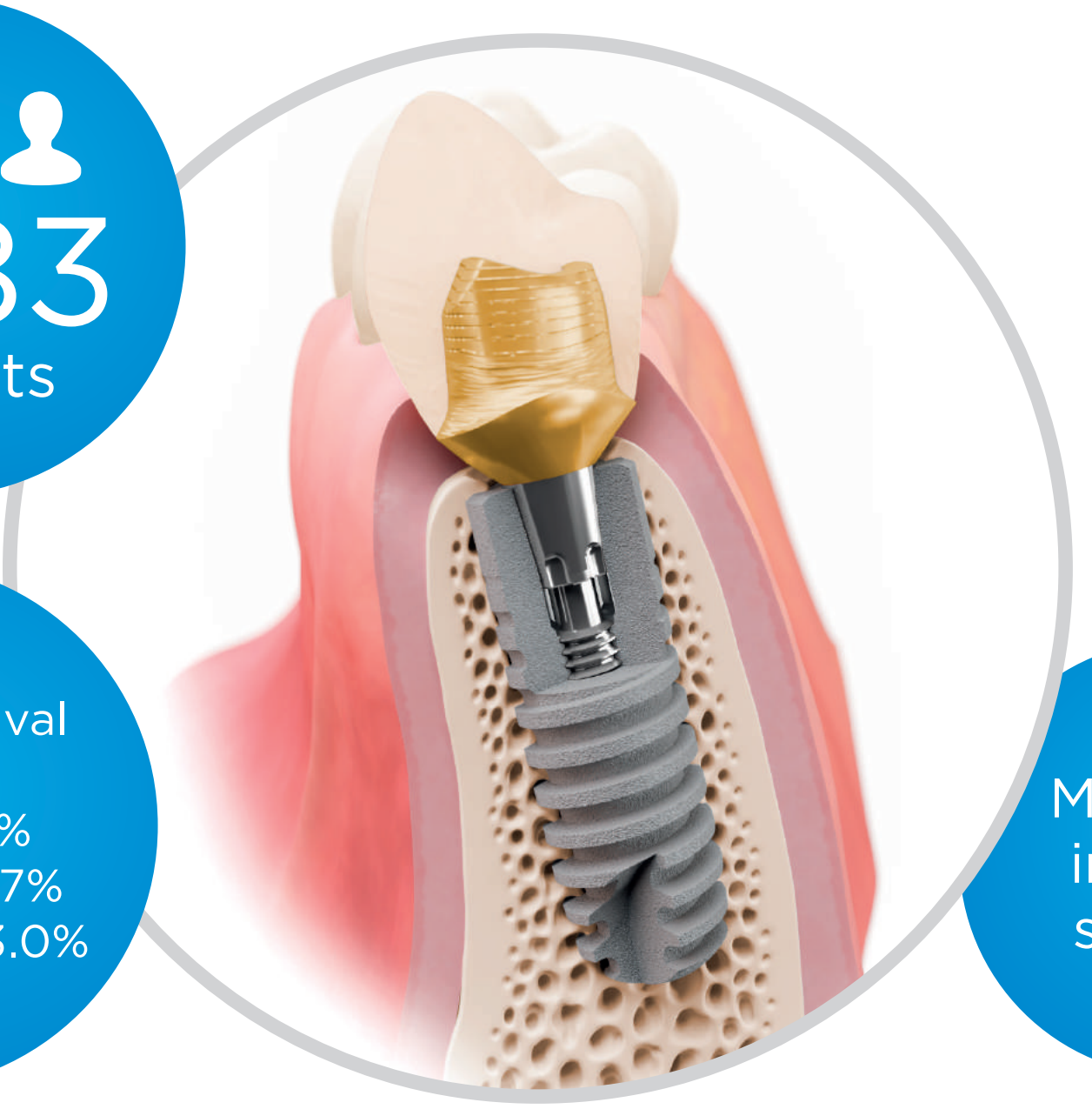

Implant survival rate after
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5 years – 96.7%
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Jesch P, Jesch W, Bruckmoser E, et al. An up to 17-year follow-up retrospective analysis of a minimally invasive, flapless approach: 18 945 implants in 7783 patients. Clin Implant Dent Relat Res 2018;E-pub Feb 15, doi: 10.1111/cid.12593. Abstract

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Interview: "Our practice has doubled since implementing the Insignia system..."

By Kinga Mollov, DTMEA

During the Ormco Forum Dubai, Dental Tribune MEA had a pleasure to speak to Dr Sonia Palleck and ask questions about the Insignia System.

Please if you could introduce yourself to our readers?
My name is Dr Sonia Palleck. I have been in solo private practice for 20 years, but teaching is one of my passions. I am a part-time clinical instructor at the University of Western Ontario where I obtained both my dental and orthodontic degrees. I have a 14-year-old daughter whom I love spending time with.

When did you first hear about the Insignia system?
I first heard about the Insignia system at an American Association of Orthodontists meeting. I was looking into passive self-ligation using the Damon System, as I was using the MBT SmartClip at the time, and wanted something that applied lighter forces. I worked with an indirect set-up and with its computer-simulated treatment, Insignia made sense to me. So, I purchased 40 cases and have never looked back.

What prompted you to provide it as a solution in your practice?
Once I implemented the Insignia system, I could immediately tell that something different was happening to what I was used to. The patients' occlusions seemed to come together almost effortlessly, and this was happening simultaneously with alignment. This saved time in the chair and time in braces, which was a win-win for both myself and my patients. I changed to Insignia as my standard of care and have been using it for all my full-fixed cases for the past seven years.

Dr Sonia Palleck

Could you explain how the Insignia System works?
Insignia uses the Approver software to move the teeth to an ideal situation. The torque values are calculated from the initial position to the final desired outcome using algorithms developed by the inventor, Dr Craig Andreiko. This is revolutionary—and I do not profess to understand how these calculations are made—only that they are effective, in a clinical setting, in finding a solution for our patients.

Customised brackets are manufactured in clear jigs that are applied indirectly to the teeth for accuracy and co-ordinated archwires are produced to further promote a solid occlusal foundation for the patient. By studying the Approver in over 2,600 cases, I firmly believe that there is a great deal of false knowledge in orthodontics that is based on high friction, high-force appliances and that conclusions about what a patient's biology will tolerate have been erroneous and misleading. Insignia is showing us what is possible and also that simple intra-arch alignment has a much greater effect on the entire dentition and occlusion than has been taught in the past.

What are the main advantages of the system?
Understanding how the Approver software works and what constitutes a "good" set-up versus an "excellent" set-up is what delineates the system's advantages. With the Insignia technique, knowing what to ask for is as important as knowing how to evaluate what is set up on the virtual teeth. Assessing what is delivered to the patient clinically and managing the actual outcome is still the orthodontist's job. Insignia does not replace the doctor. It is simply a tool, like any braces system, but it is more accurate and effective, because it is based on a visualised solution rather than an imagined one. It saves time, not only in the length of appointments, but in the overall number of appointments—making it more profitable.

What are the overall results of using the Insignia system in a practice, not just clinically, but also in terms of patient loyalty?
Our practice has doubled since implementing the Insignia system and I firmly believe it is because we have a reputation for clinical excellence using technology. By solving so many of the shortcomings of traditional braces systems, Insignia has allowed me to work on finishing and detailing cases to a level that was never an option before without excessive treatment time or increasing the number of appointments. Patients love the beautiful results that are gained in a shorter time.

What would you say to your colleagues who are hesitant about using the system?
The cost factor stops a lot of doctors from using Damon or Insignia. They argue that Insignia costs more and that it is not justified. I could never put a price on happiness, but the simple fact is that efficient treatment saves money. Insignia has a fixed overhead cost for me and controls the practice's cashflow—we only have costs when there is production required. The patient's treatment that is not being solved is no longer being subsidised by others, which is a common theme with traditional orthodontics. So, in short, every Insignia case is profitable—this is how a business should run.

My impression of most doctors I speak to is that they harbour a fear of change. Changing any system in an orthodontic office is messy at the start. I think a lot of people look for reasons not to change rather than embrace the process. Practitioners need to understand that once the kinks are worked out and they start practicing on the computer and not on patients, the end result is a gorgeous, streamlined practice that is a joy to work in. DT

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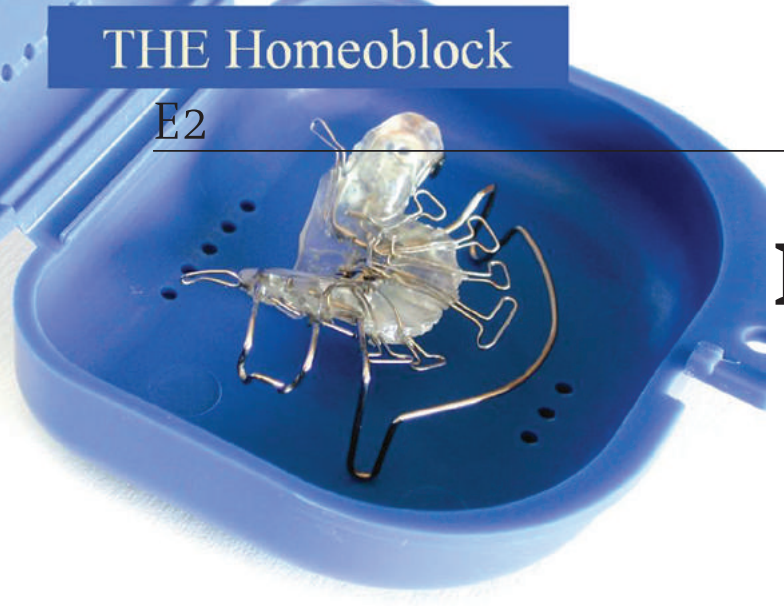


Fig. 2: The Homeoblock appliance.

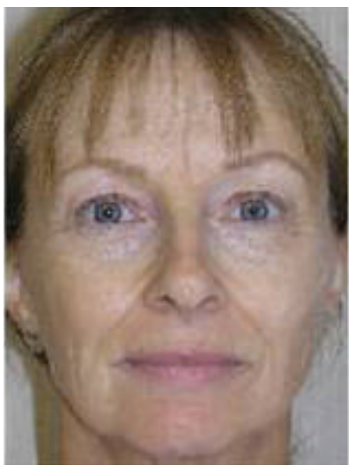
Improving the facial balance in an adult using slow arch development techniques

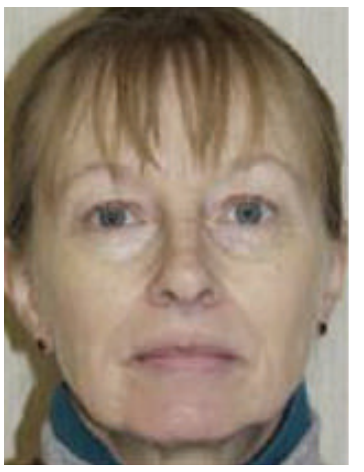
By Dr Derek Mahony, Australia, & Dr Theodore R. Belfor, USA

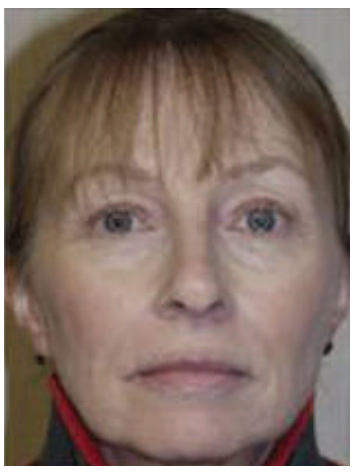
Introduction

Anti-ageing is a branch of medicine focused on how to prevent, slow or reverse the effects of ageing, thus helping people to live longer and healthier lives. Recently, however, more evidence-based medicine has led to anti- ageing becoming a multi-billion-dollar industry. In the past few decades, the market for anti-ageing products and services has grown into a global industry valued at an estimated US$261.9 billion in 2013, up from US$162 billion just five years before, according to BCC Research, a publisher of technology market research reports based in Wellesley in the US.[1]

The recent medical literature and evidence-based medicine show that, as we age, there seems to be a loss of fat volume in some areas of the face, as well as a change in the morphology of the facial skeleton. Facial soft-tissue augmentation by injection has become increasingly popular as a minimally invasive option for patients seeking cosmetic facial enhancement. Replacing lost soft-tissue volume allowed for a more comprehensive approach to total facial rejuvenation. It has been demonstrated that orthodontic treatment with an intra-oral orthopaedic dental appliance (Homeoblock, OrthoSmile) increases soft-tissue volume and enhances facial symmetry, producing soft-tissue changes consistent with improved facial esthetics.[2]







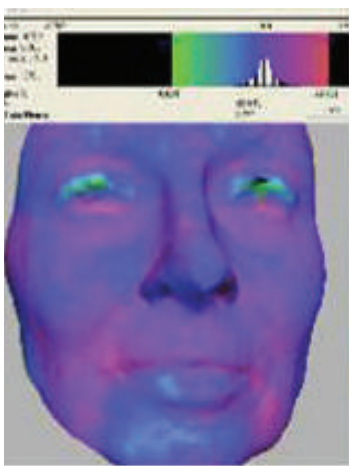


Fig. 3: The pretreatment face, the post-treatment face at six months and nine months, and finally, a morphometric evaluation of the change.

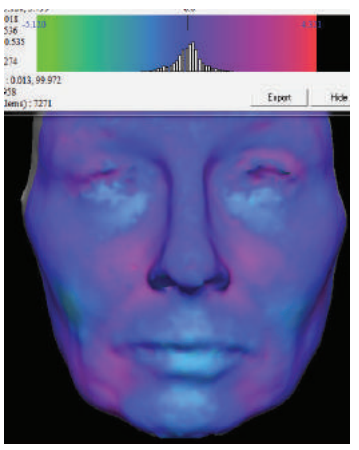


Fig. 4: Morphometric evaluation of the final results: finite element analysis showed increased facial volume with a directional change of almost 4 mm, indicated by the red to orange colour.

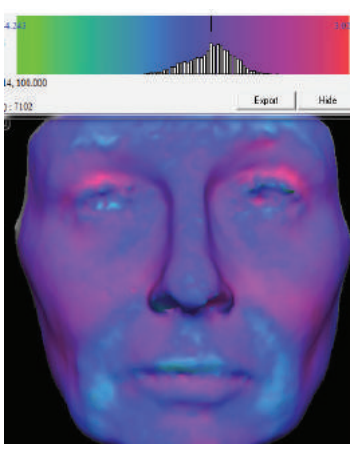


Fig. 5: Superimposing the red post-treatment face over the blue pretreatment face, we can graphically illustrate the volumetric changes that occurred during our treatment. There was an increase in volume in the frontal, supraorbital, inferior orbital, zygomatic, nasal base, upper lip, nasolabial depression, and marionette and pre-jowl areas.

This appliance can be added to the treatment protocol of facial injection to create a relatively non-invasive interdisciplinary approach to midface enhancement.

With this article, we show how orthopaedic/orthodontic appliance therapy, in conjunction with the placement of dermal fillers for the reduction of lines/wrinkles and depressions in the face, can produce desirable facial soft-tissue enhancement. Furthermore, we show that the volumetric changes achieved by this combined treatment approach can produce a desirable result, namely a more youthful appearance.

Case study

A healthy woman in her mid-sixties presented for treat- ment with a strong desire to improve her facial appearance (Fig. 1). Her oral hygiene was good and there was no active periodontal disease. She had headache symptoms and clinical examination showed a disc displacement with reduction on her right side, with a maximum jaw opening of 38 mm. Her centre line was displaced 2 mm to the right and lined up when she opened < 10 mm, indicating that she had a mandibular displacement to the same side. A Homeoblock appliance, with a 5 mm bite block on the right side (to decompress her temporomandibular joint), was fabricated and delivered (Fig. 2). When she closed on the bite block, her occlusion freed up and the muscles realigned the mandible so that her centre line lined up correctly. Her headache symptoms were relieved in three weeks and her maximum opening was improved to 42 mm. The patient continued Homeoblock treatment for nine months.

Intra-oral and extra-oral photographs were taken to monitor treatment, and 3-D stereophotogrammetry was performed. Extra-oral 3-D digital photographs were taken with a facial capture system (3dMD). A facial capture system (3dMD/Kodak) and stereophotogrammetry were used to generate a clinically accurate digital model of the patient's facial surface. It uses a technique of stereotriangulation to identify external surface features viewed from at least two cameras. This approach incorporates the projection of a unique, random light pattern that is used as the foundation for triangulating the geometry in 3-D. The capture takes < 2 ms per frame. The data is processed and a highly precise < 0.5 mm root mean square of the distance measured is calculated, creating a digital model of the patient that is ready for immediate clinical use. Stereophotogrammetry for quantifying facial morphology was introduced in a study published in the Journal of Dentistry in 1996.3 It was concluded that "stereophotogrammetry is a suitable 3-D registration method for quantifying and detecting development changes in facial morphology".[3]

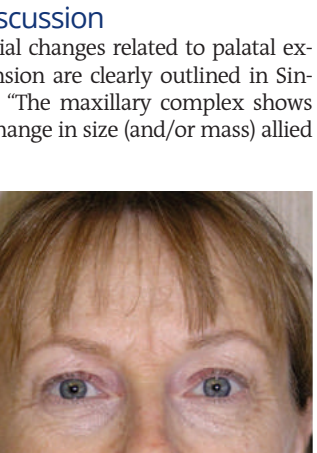


Fig. 6: Morphological facial changes in the lips, zygoma and jowl area after the placement of 1 ml Restylane and 1.3 cc Radiesse. Note the deeper red to orange colour in the areas where the injections were placed.

Evaluating the patient's face over the nine months of Homeoblock treatment for her temporomandibular dysfunction showed a change in the morphology of the face (Fig. 3). Morphometric analysis was performed by superimposing before and after 3-D images and using finite element modelling. Thousands of triangular reference points were used to establish the change. The blue area indicated no change and the red to orange areas showed an increased dimension of up to 2.9 mm. We saw an increased volume above and under the eyes, the zygomatic region, the upper lip, and the marionette and pre-jowl areas. From the facial photographs, we could see a reduction in the lines, wrinkles and depressions (Figs. 4 & 5).

After nine months, the patient's facial changes prompted her to go forward with injections of dermal fillers. She was given 1 ml of Restylane (Galderma) for lip enhancement and two 1.3 cc corrections with Radiesse (Merz Aesthetics) in the pre-jowl and marionette areas and along the inferior border of the mandible, and the inferior and lateral borders of the zygoma (Fig. 6).

Results

Post-treatment, the patient's face appeared more youthful with better defined cheekbones and a firmer jaw line. The skin appeared smoother with fewer lines, wrinkles and depressions (Figs. 7a & b).

Discussion

Facial changes related to palatal expansion are clearly outlined in Singh: "The maxillary complex shows a change in size (and/or mass) allied with an increase in structural complexity, in association with biological processes."[4] Palatal expansion presumably, switches on osteoblastic genes associated with active boney deposition and concomitant remodeling of the spatial matrix ensues."[4] In relation to the changes around the eyes, we must recall that the maxilla forms the floor of the orbit and skeletal changes may become apparent after expansion;[4] specifically, changes in orbital morphology may be reflected on the skin of the face: as the lower eyelids become tighter, the lateral canthus becomes more horizontal; facial width increases, particularly at the zygomatico-maxillary sutures; and the craniofacial form, putatively, not only functions better, but looks more attractive.[4] These changes have been documented in children, where palatal expansion is an everyday occurrence. The current article documents similar changes in a non-growing adult. Combining the results of palatal expansion and the placement of dermal fillers, we obtained a very satisfactory improvement in facial aesthetics. DT

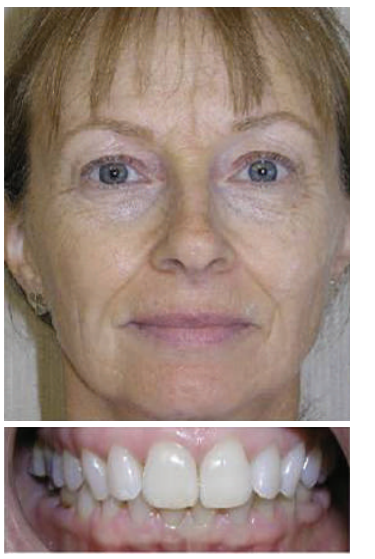


Fig. 1 Pretreatment facial and anterior intra-oral photographs (note deep dental overbite).

Editorial note:
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Figs. 7a & b: Before and after facial photographs.

Indirect bonding: Digital technique vs conventional method

By Drs Arturo Fortini, Alvise Caburlotto, Elisabetta Carli, Giulia Fortini & Francesca Scilla Smith, Italy

One of the peculiar features of straight-wire techniques is the in-built tip, torque and in-out adjustments in the brackets, which reduces the need for making first-, second- and third-order bends on the arch. It follows that the precision in the positioning of the brackets is of fundamental importance for making the correct adjustments and for the consequent predictability of the result, thus making bonding one of the most important steps of the whole treatment.

With direct bonding, there is a high margin of error in bracket positioning, due both to the dental professional's experience and to difficulty with visualisation. The positioning errors that can be made are on the horizontal, vertical and mesiodistal axes, and can create the need to reposition the brackets during orthodontic treatment, resulting in a waste of time. Over the years, indirect positioning techniques have been developed to make positioning more precise and to make the procedure as fast as possible. The aim of this study was to compare a new, digitally assisted method of indirect bonding (Transfer Bite Leone) with the conventional clear two-tray technique, using the split-mouth method to evaluate the amount of remaining composite around the base of the bracket in both procedures.

In order to avoid differences due to placement, we used the same dedicated programme for both methods. STL files, obtained from intra-oral arch scanning or stone model scanning, were loaded and processed with the Leone Maestro 3D Ortho Studio software (AGE Solutions). This digital tool permits the segmentation and width and height measurement of the teeth, and the subsequent determination of the long axis and the average height of the clinical crowns, in order to virtually arrange the brackets in the correct position. The dentist can later change the positioning height, the torque, the tip and the rotation to obtain an absolutely individualised and strategic positioning of the brackets for the case (Fig. 1).

Once the ideal position of the brackets had been obtained, we used the Maestro 3D software to obtain a file that allowed the 3-D printing of the model in which, in the left hemi-arch, the brackets were integrated to be able to use it to produce the conventional thermoformed clear trays that would contain the brackets to be placed in the mouth. In the right hemi-arch, using the software, we designed a Transfer Bite that permitted precise positioning of the brackets. The Transfer Bite is made of biocompatible material and is produced using a high-precision 3-D printer according to specific parameters.

Our split-mouth clinical investigation protocol was accepted by the American Association of Orthodontists committee for the table clinics that we presented at the 2017 annual congress in San Diego in the US (Fig. 2). This procedure clearly demonstrated the limitations of the conventional two-tray technique: inconsistent accuracy, an excess of composite around the base of the bracket that cannot be removed during the bonding step, and difficulty in removing the thermo-printed support (Figs. 3 & 4).

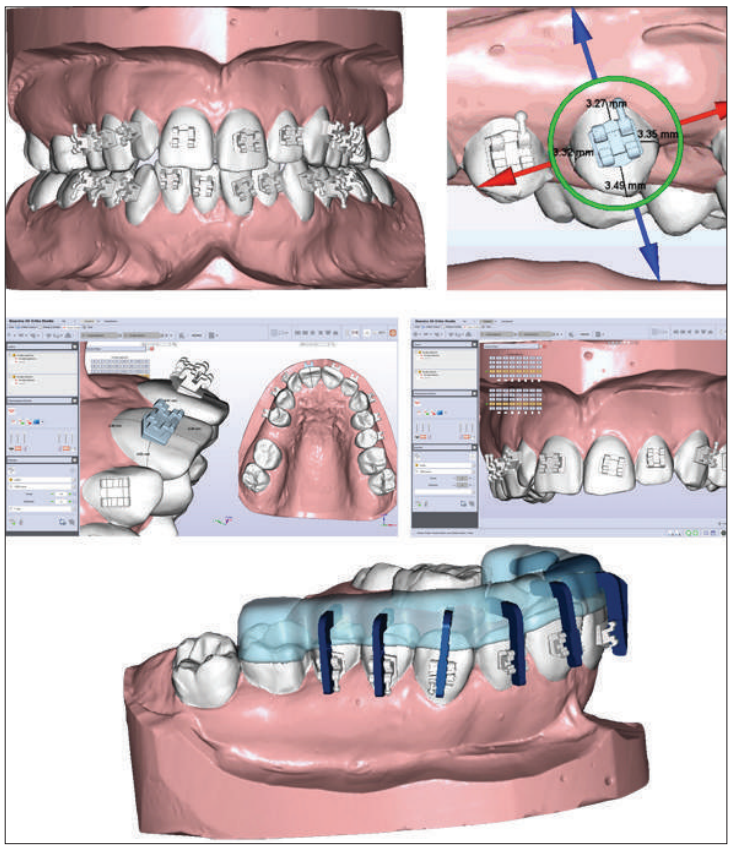
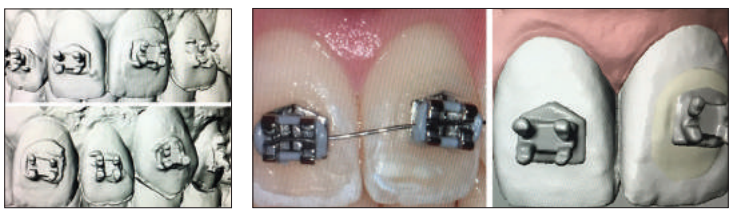


Fig. 1: Dental studio-Ortho Studio Module.

Fig. 2: Indirect bonding though Leone's JIG and brackets.



Figs. 3 & 4: Limitations of the conventional method, such as non-constant accuracy and excess of composite around the base of the attachment.

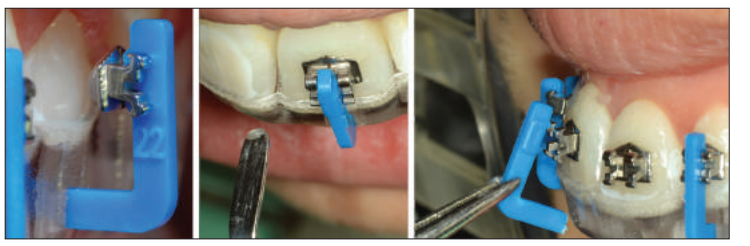


Fig. 5: Leone's Transfer Bite system.

The Transfer Bite system with positioning devices was found to be better because it allows the clinician to have a complete view of the base of the brackets, optimising the removal of excess composite (Fig. 5). In addition, the Transfer Bite, compared with the thermoformed trays, has greater stability on the dental arches, with an even better precision result, and aids the dentist in repositioning the brackets in a detachment case.

Our experience of using the Transfer Bite system on 12 patients allows us to confirm that this new indirect bonding method is simpler, easier and more accurate than the conventional method. Furthermore, it proved to be a less operator-dependent technique, allowing even less-experienced clinicians to achieve optimal results.

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Happy patient with durable, natural outcome

Andy Wallace describes a case that successfully combines fixed orthodontics and bleaching with the strength of composite edge-bonding restorations

By Dr Andy Wallace, UK

A 49-year-old female attended Bachelors Walk Dental because she was unhappy with the appearance of her upper and lower front teeth (Figures 1a and 1b). She wanted them straightened to create a more attractive smile and was hoping to have removable orthodontic appliances.

I explained to the patient that without treatment, the malalignment might worsen but there were a range of options she could consider.

'Instant orthodontics' could be accomplished with veneers but this method would require heavy preparation, which could result in significant damage to the tooth structure and possible loss of vitality. Veneers placed after invasive preparation would probably have a lifespan of less than ten years. She was also advised that her teeth could continue to crowd, even after veneers were fitted. Therefore, retainers might still be required.

Orthodontic choices

The Inman Aligner, clear aligners or fixed appliances were the options offered to the patient. The Inman Aligner would be a quick and inexpensive way to correct the incisors, but would have limited success with the canines and gum levels.

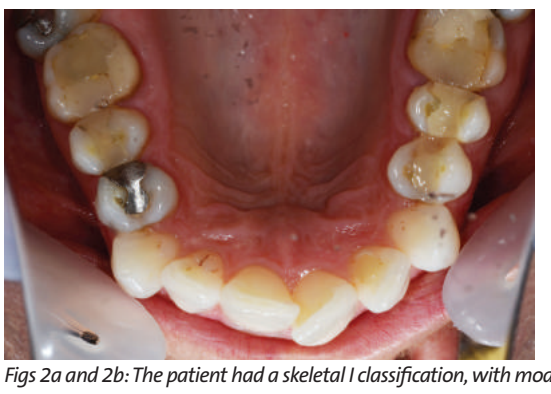
Clear aligners could potentially result in a similar outcome to fixed braces. They are discrete, but have a longer treatment time and are more expensive.

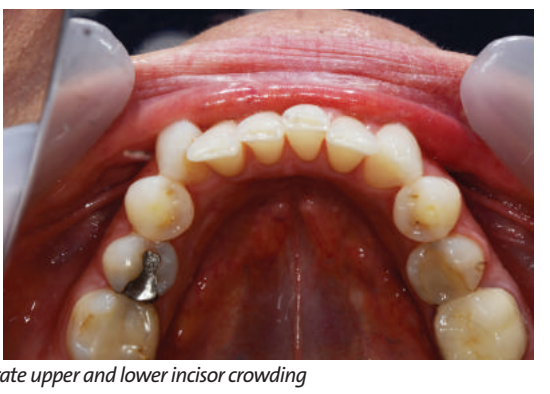
Fixed appliances offered the most potential for improving the aesthetics, and could be used to achieve the most controllable and predictable outcome.

A full orthodontic and diagnostic assessment was undertaken. The patient had a skeletal I classification, with moderate upper and lower incisor crowding (Figures 2a and 2b). She wanted the final outcome to be as successful and efficient as possible, so opted for fixed braces using clear brackets (Figures 3a and 3b). The patient was made aware that interproximal reduction (IPR) was needed to avoid excessive proclination of the incisors.

Permanent fixed and removable retainers were also required after treatment, as her teeth would continue to move throughout her lifetime.

Figs 1a and 1b: The patient was unhappy with the appearance of her upper and lower front teeth





Figs 2a and 2b: The patient had a skeletal I classification, with moderate upper and lower incisor crowding

Figs 3a and 3b: The patient opted for fixed braces, using clear brackets

Fig 4: After alignment, additional composite bonding would be required

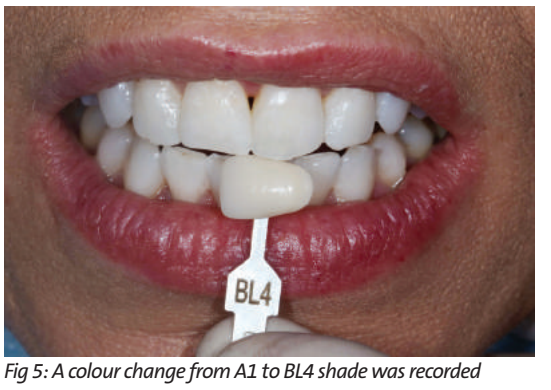


Fig 5: A colour change from A1 to BL4 shade was recorded

Effective alignment

It was clear that the wear on the teeth would result in an irregular incisal edge, once the teeth had aligned.

The patient was informed that after alignment, additional composite bonding would be required (Figure 4), using the align, bleach and bond (ABB) protocol, pioneered by Tif Qureshi (Qureshi, 2011).

The relative positions of the teeth, lips and face were recorded using Spacewize, the diagnostic dental crowding software developed by Intelligent Alignment Systems (IAS). This calculates the space requirements and serves as a prescription to the laboratory for the Archwize digital preview.

Monocrystalline sapphire brackets were pre-positioned and transferred into indirect bonding trays, ready to be bonded intraorally. The brackets were placed in the ideal position outside the mouth to save time and reduce the possibility of any errors during the bonding process. The teeth were isolated and the brackets attached, following standard resin cementation protocols.

A series of nickel titanium wires were used, ranging from .012 to .016 to 20 x 20, as the arches aligned. The patient was seen for review at monthly intervals. The teeth were shaped progressively with IPR strips to create the necessary space. IPR of 1.4 mm was carried out on the upper arch and 1.6 mm on the lower arch.

Alignment was completed after seven months and the patient approved the end result.

Whitening and retention

Following bracket removal, impressions were taken to allow temporary vacuum-formed retainers and bleaching trays to be manufactured. Chairside whitening was completed with Philips Zoom 6% hydrogen peroxide gel and the Philips Whitespeed lamp. A colour-change from A1 to BL4 shade was recorded (Figure 5). In order to enhance the chairside result, the patient was provided with home-whitening trays and Philips Zoom Daywhite 6% hydrogen peroxide, take-home whitening treatment to use for one week.

At the three-week review, the final shade was recorded as BL3/BL4, and the fixed retainer wires were bonded. To ensure correct positioning during cementation, the retainer wires were fabricated by the laboratory on an acrylic placement jig. Before bonding, I checked the passive fit of the retainer and jig. I assessed where the wire was going to sit, then removed both the wire and jig.

The back of the teeth were 'tickled' with a bur to roughen and remove some of the outer layer of enamel, which cannot be etched well. At this stage, I sometimes sandblast with aluminium oxide to remove any biofilm and the highly-fluoridated surface layer of enamel. This reduces surface tension, allowing a better etch pattern. The teeth were etched with 37% phosphoric acid etch gel and bonded using Kulzer Ibond Universal. Ibond was used because of its simple bonding protocol.

The wires and jig were put back in the mouth and a thin layer of Kulzer Venus Diamond Flow was placed, just deep enough to cover the wire. The composite was light -cured, as per the manufacturer's instructions.

The jig was cut off and more Diamond Flow was applied to the rough edges of the wire, followed by further curing. Venus Diamond Flow offers ideal viscosity, making it perfect for the placement of indirect fixed-wire retainers (Figures 6a and 6b).

Composite aesthetics and strength

The edge-bonding was completed using Kulzer Venus Pearl (Figures 7a and 7b) during the same appointment. The shade was selected from the Venus Pearl shade guide and judged to be between Bleach Light (BL) and Bleach Extra Light (BXL).

Tooth preparation using a diamond bur included the removal of unsupported enamel and minimal roughening beyond the enamel composite interface. Venus Pearl Opaque Light Chromatic (OLC) shade was placed in a triangular section, following the 'reverse triangle technique', as described by Tif Qureshi (Qureshi, 2016).

The BL enamel shade, with small BXL highlights, was placed in a single layer. This technique offers an aesthetically pleasing outcome by helping to address irregularities and incisal edge wear, as well as minimising chair time and increasing the strength of the restoration. Both applying a single layer of the opaque dentine shades and the chosen shade of the enamel composite reduces the risk of introducing errors or bubbles.

I have been using Kulzer Venus composites for a number of years. Venus Pearl lends itself very well to the reverse triangle technique. The enamel shades are sufficiently opaque to

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Figs 6a and 6b: Venus Diamond Flow offers ideal viscosity, making it perfect for the placement of indirect fixed-wire retainers

Figs 7a and 7b: The edge-bonding was completed using Kulzer Venus Pearl

Fig 8: At the three-year recall appointment, only the very slightest loss of shine can be seen

Fig 9: The patient was so pleased with the final result, she has since recommended several new patients to the practice

mask the joins when edge bonding and lengthening teeth. They blend well to the natural enamel and adapt perfectly to the colour of the surrounding dentition.

Durable result

Polishing was completed using the Kulzer Venus Supra Polishing kit. Its extensive silicone range is filled with microfine diamond powder. The pink pre-polishers are effective for removing scratches and creating secondary anatomy, while the grey ones give a great, long-lasting finish. A final lustre was achieved using aluminium oxide paste on a felt wheel.
New vacuum-formed retainers and bleaching trays were fabricated for the new shape of the teeth. They would help to retain the treatment outcome and maintain teeth whitening. I recommended three to four days of top-up bleaching, using Philips Zoom Daywhite, three times per year.

At the three-month follow-up appointment, I found that the upper retainer wire had debonded. The patient was instructed to wear the removable retainer full-time while the laboratory made a new wire.

The patient attended the surgery the following week and the new retainer wire was bonded in place. New vacuum-formed retainers were fabricated after approximately two years. The patient continues to be seen every six months for her examination and review.

We were both delighted with the ABB treatment outcome. The composite provided a long-lasting, natural restoration. At the three-year recall appointment, the edge-bonding had no chips or appreciable wear. No further polishing had been undertaken since the original treatment and only the very slightest loss of shine can be seen (Figure 8). At the next appointment, I plan to spend a few minutes re-polishing.

The patient has maintained the whitening beautifully, using the 'three by three' protocol - three days whitening, three times per year.

The patient was so pleased with the final result, she has since recommended several new patients to the practice (Figure 9). Most have proceeded with similar minimally-invasive treatment. Offering alignment, bleaching and bonding is a very effective way of attracting new clients.

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