COLOGNE, Germany: Held terminally in Cologne, Germany, the International Dental Show (IDS) is the largest and most important event for the global dental industry. At the 2017 edition, which took place from 23 to 25 March, over 2,300 companies from around the world exhibited, including international market leaders, among them Dentsply Sirona, Ivoclar Vivadent, 3Shape, Planmeca, VITA Zahndteknik, Colosse, Ammann.

By Dental Tribune MEA / CAPPmea
exceedingly lightweight and fast—the Planmeca Romexis software suite, and the Planmeca PlanMill 45 milling unit for dental clinics. According to the company, it combines superior usability with accurate, high-speed milling and is the most powerful unit for chairside fabrication the dental market has seen. With these products, Planmeca provides a full clinical digital workflow. Also at IDS, the family-owned business based in Finland premiered its Dream Clinic Show, which includes all of the latest Planmeca equipment and takes users through a case in which it is all applied.

VITA

VITA Zahndfabrik, a family-owned company now run by the fourth generation, presented new process-safe solutions for highly aesthetic results, as well as efficient and smooth clinical workflows. Among these were two materials based on the well-established restorative VITA ENAMIC ENAMIC multilayer and the highly translucent VITA ENAMIC SI; the space-saving VITA SMART.FIRE furnace for the dental practice that allows for more efficient ceramic chairside restorations, and the compact VITA ADV-A CUTING SOLUTIONS cmentation system. For the dental laboratory, VITA introduced its first full digital system, VITA VIONIC SOLUTIONS, which makes complete dental restorations practicable and economical, as well as VITAFAN EXCELL, a leafless type of VITA MBP compared to the VITA VM.LC flow veneering composite.

COLTENE

COLTENE is a global leader in the development, manufacture and sale of consumables and small equipment for dental treatment applications. At IDS, the Swiss specialist presented its Endo Highlight Kit, which combines its most important new products in a practical and compact set, including flexible HyFlex EEM NITI files for preparation, the corresponding gutta-percha points and GuttaFlow biofilm for obturation. On contact with bodily fluids, the bioactive filling material generates hydroxyapatite crystals, which can promote natural healing in the root canal and the regeneration of bone and dentine. The company highlighted its CAD/CAM block BRIILLIANT Crios, which is compatible with Dentistry Simon’s CEREC system, and introduced its novel and smart BioSonic UCryo ultrasonic cleaner.

At IDS, Austria-based company Amann Girrbach highlighted its continuing success as a manufacturer of innovative CAD/CAM equipment and materials. Formed in 1974 through a merger of two companies, it has quickly become a pioneer in dental technology and launched a number of new products in just the last year. The Ceramill DNA Generation, for example, has revolutionised CAD/CAM processing through its unique carving mode, which reduces the time needed to mill materials such as glass-ceramics and hybrid ceramics. In addition to this, the Ceramill Mikro Xc and Ceramill Motion 2 units have been equipped with a spindle designed for carving mode. Amann Girrbach announced that the recent growth in sales of its CAD/CAM equipment and consumables has led to the building of a second assembly site.

North American company Carestream Dental provides imaging, CAD/CAM, software and practice management solutions for dental professionals. At its IDS booth, Carestream showcased its comprehensive dental imaging and processing portfolio, including the CS Crossfire 3D, an advanced system for the CS iQ 3D Imaging Platform that can cover 90 per cent of what the general practitioner does in daily practice. The system consists of a hand-held instrument and a reusable MultiTip. It measures the resonance frequency of the MultiTip, which corresponds to the stability of the implant, according to the implant Stability Quotient scale.

At IDS, UK-based global dental implant company Neoss showcased the Neoss Penguin/Neos instrument for measuring implant stability. According to the company, the pentagonal, short-taper design offers a consistently reliable measurement of implant stability at an affordable price, finalising with the optimal accuracy of use of resonance frequency analysis in daily practice. The system is made up of a hand-held instrument and a re-usable MultiTip. It measures the resonance frequency of the MultiTip, which corresponds to the stability of the implant according to the implant Stability Quotient scale.

Dentistry Simon (Photograph: Koenemann)

During the event, FONA introduced ten new products, including the complete chairside CAD/CAM solution MyCrown that enables dentists to cover crowns, veneers, inlays, onlays and small-span bridges in just one visit. The company’s latest state-of-the-art addition consists of an open-format intra-oral scanner, design software that guides the dentist step by step and a milling unit targeted at the general dentist, the system’s functions are intended to cover 90 per cent of what the general practitioner does in daily practice, purposely excluding specialist functions, such as for implantology and orthodontics. The system is very intuitive, according to the company, allowing the dental assistant to work with it easily as well, and thus enabling the dentist to focus on the most important parts of the procedure. By offering a top-notch system at a room affordable price, FONA aims to be the top choice for dentists wishing to enter into CAD/CAM. Also exhibited were the new Campine and Durham treatment centres. Stel- lantis 3D sensor, Aquamarine diode processing, and S2 Digital Milling Unit, a revolutionary unit for chairside milling.

The annual conference is organised by the Centre for Advanced Professional Practices (CAPP) and covers many of which will be showcased for the first time in the Middle East. The pre- and post-event hands-on programmes are offered by many of the leading dental companies, it has quickly become a pioneer in dental technology and launched a number of new products in just the last year. The Ceramill DNA Generation, for example, has revolutionised CAD/CAM processing through its unique carving mode, which reduces the time needed to mill materials such as glass-ceramics and hybrid ceramics. In addition to this, the Ceramill Mikro Xc and Ceramill Motion 2 units have been equipped with a spindle designed for carving mode. Amann Girrbach announced that the recent growth in sales of its CAD/CAM equipment and consumables has led to the building of a second assembly site.

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Solutions for better, safer, faster dental care

Dentsply and Sirona have joined forces to become the world’s largest provider of professional dental solutions. Our trusted brands have empowered dental professionals to provide better, safer and faster care in all fields of dentistry for over 100 years. However, as advanced as dentistry is today, together we are committed to making it even better. Everything we do is about helping you deliver the best possible dental care, for the benefit of your patients and practice.

Find out more on dentsplysirona.com
Establishing Bulk Fill Composite in Your Direct Restorative Procedure

By Dr Jeff Blank, USA

Over the last decade, the science and technology of composite materials have been advancing at a rapid rate. Today’s materials help me perform better dentistry and allow me to do it more efficiently than ever, which is extremely important for my busy practice. Like a majority of dentists, a large part of my day is spent doing composite dentistry, so I need products that work quickly. The products I have in my armamentarium were chosen carefully and were chosen based on significant research. I don’t want to use something on a patient that could cause issues later just because I didn’t do my due diligence.

With my current mix of materials and products, I can perform procedures that I wouldn’t have attempted years ago, or at least would have struggled through!

The Advancement of Bulk Fills

There has long been a quest for a “white amalgam” in dentistry. Many dentists like to use amalgam because it’s easy to place and can last extremely long, but patients don’t like it because it doesn’t offer the esthetics of a composite. In the early 2000s, bulk fill composites began entering the market, and in my opinion, the properties of these materials were not up to par.

Today’s bulk fill materials have evolved to provide clinicians a fast and easy option for deep cavities and take away the tedious work required for incremental layering. With these advancements, the likelihood of voids can be reduced, and the amount of shrinkage can be reduced, which makes bulk fill composites very appealing to me.

My go-to bulk fill is Filtek™ Bulk Fill Posterior Restorative, and I can honestly say that I use it in every case in my practice. This material works exactly as it says it should. I can place up to 4mm increments and feel confident in a full cure. Research done by Oregon Health and Science University has shown Filtek Bulk Fill Posterior’s excellent cure capabilities and validates an optimized curing protocol.

The Introduction of Workflows

A large part of how I choose products is through research, but it’s also based on how well they fit into a specific workflow. I look for products that work together and provide synergies throughout the workflow. Recently, I’ve been using a set of products from 3M for my direct restorations that provide improved efficiency.

My go-to adhesive is Single Bond Universal Adhesive, which truly is universal and can be used in all three etch modes. The adhesive’s properties provide a strong bond and give me virtually no post-op sensitivity. I use a Filtek Bulk Fill Primer for my deep restorations, as I can place one increment up to 3mm. I don’t need to use an additional layering cap, as the composite has excellent wear resistance.

I recently began using the Elipar™ Deep Cure S 5LED Curing light and have achieved a reliable light curing procedure. For finishing and polishing a restoration, my favorite product is the Sof-Lex™ Spiral Finishing and Polishing Wheels. This two-step system features a unique, flexible shape that adapts to irregular, convex and concave tooth surfaces, making finishing and polishing easier.

With these products, I am able to improve productivity, while saving valuable chair-time. I can perform direct restorations with speed and simplicity.

Case Study

The patient was in her mid-twenties. She had deep mesio-distal decay on teeth #13 and #14. Due to limited financial resources, a crown was placed on #13 and #14 immediately following.

Step 1

Initial access was made on tooth #13 (Fig. 2). Upon initial access, the extent of the decay became clear, and additional decay was removed to create the final preparation of 5mm. The preparation was then selectively etched (Fig. 2) (Scotchbond™ Universal Etchant), and after 15 seconds the etchant gel was rinsed off and dried.

Step 2

Filtek Bulk Fill Primer was then placed in the preparation up to 5mm (Fig. 4). Tip of the composite was placed in the interproximal box and slowly raised while material was dispensed (Fig. 5). The composite was packed with an instrument to adapt to the preparation wall and floor (Fig. 6). The composite was then light-cured.

Step 3

Filtek Bulk Fill Paston was then placed in the preparation up to 5mm (Fig. 4). Tip of the composite was placed in the interproximal box and slowly raised while material was dispensed (Fig. 5). The composite was packed with an instrument to adapt to the preparation wall and floor (Fig. 6). The composite was then light-cured.

Step 4

Initial contouring was completed with a diamond bur to blend the composite with the surrounding dentition (Fig. 7). Sof-Lex™ Spiral Finishing and Polishing wheels were then used. The burger wheel removed initial surface scratches (Fig. 8), and the white wheel provided a final polish (Fig. 9). The final restoration was completed (Fig. 10).

To learn more about 3M Oral Care products, visit: www.3M.com/oralcare

Dr. Jeff Blank, USA

He has graduated from the Medical University of South Carolina, College of Dental Medicine in 1989 and maintains a full-time private practice in the Carolina Smiles Center in Fort Mill, South Carolina. He is the founder of New Millennium Education, which offers personalized mentoring programs for those seeking to advance their careers as orthodontic and cosmetic dentistry. He has lectured extensively both domestically and abroad since 1999, published numerous clinical manuscripts, and has spoken at national and international dental conferences. For questions, comments, or to arrange for Dr. Blank to speak at your upcoming local, regional or national dental program, he can be reached at jblank@compassion.net or by visiting www.newmillenniumedu.com and www.carolinaeclinic.com.

3M Oral Care at 37th International Dental Show

By 3M

On 22-25 March 3M Oral Care participated in one of the leading trade fairs of the dental industry - IDS 2017, Cologne. During the five days of the show the booth was visited by the large number of doctors of various specializations coming from various countries from all across the globe.

The main theme of the booth was dedicated to “Science Applied to Life” concept and dentists could get acquainted with various new products and technologies in various dedicated areas in the Direct Procedure section and in the Indirect Procedure section. Using the patient MARC simulator the technique of polymerization was demonstrated in the Indirect Procedure section the main parts of the Success Simplified procedure were demonstrated to show the benefits of precision of materials, various range of cements and temperature materials in the Orthodontic and Preventive section doctors could learn more about the Esthetic solutions with Clarity™ Advanced ceramic brackets complemented with AFC Flash Free adhesive coated appliance system, as well as visit hands-on sessions on Clin Cure™ Preventive procedure.

The Digital area was equipped with mobile 3M True Definition scanners complemented with APC Flash Free mobile 3M True Definition scanners complemented with APC Flash Free enabling to carry our demonstration on Clinpro™ Preventive procedure. For finishing and polishing a restoration, my favorite product is the Sof-Lex™ Spiral Finishing and Polishing Wheels. This two-step system features a unique, flexible shape that adapts to irregular, convex and concave tooth surfaces, making finishing and polishing easier. With these products, I am able to improve productivity, while saving valuable chair-time. I can perform direct restorations with speed and simplicity.

3M Oral Care at 37th International Dental Show

Please see Instructions for Use for additional information, including curing protocols.


3M Booth at IDS Cologne 2017

Fig. 1 Fig. 2 Fig. 3 Fig. 4 Fig. 5 Fig. 6 Fig. 7 Fig. 8 Fig. 9 Fig. 10

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To learn more about 3M Oral Care please visit: www.3MCo.jar/esp

Dental Tribune Middle East & Africa Edition | 3/2017
3M Oral Care

Takes less time, so you have more time.

There are things in life you don’t want to miss. And the more complicated a procedure is, the greater chance there is for something to go wrong and disrupt your day. That’s why 3M Oral Care has simplified posterior restorations ... the most frequently performed direct restoration. By using Filtek™ Bulk Fill Posterior Restorative with three other innovative products, you’ll move through posterior restorations with speed and simplicity. See how our Posterior Restorative Procedure can help keep you on schedule ... because we know your time outside of work matters.

www.3MGulf.com/espe
EVO.15 - The world's safest contra-angle, developed by Bien-Air

By Bien Air

BIENNE, Switzerland: In response to public health authorities’ growing concern over patient burns caused by rotary dental instruments, Swiss medical technologies company Bien-Air Dental has developed the EVO.15, the safest contra-angle on the market today.

In procedures involving contra-angles, the slightest contact between the instrument’s push-button and the inside of the patient’s cheek may cause the instrument to overheat, resulting in possible burn injuries. While overheating can be an indication of a damaged or plugged instrument, laboratory evaluations reveal that this hazard is just as prevalent in new and properly-maintained handpieces,” says Clementine Favre, Chief Technical Officer. She goes on to specify that the most severe cases have caused third-degree burns requiring reconstructive surgery, and potentially exposing the practitioner to lengthy legal action.

Equipped with patented Cool-Touch™ heat-arresting technology, the EVO.15 is the only contra-angle proven never to exceed human body temperature. After years of research and development, this technology works to protect both the patient and the clinician during some of the profession’s most frequently performed procedures. Additionally, the EVO.15 features a considerably lighter and lighter shockproof head and premieres technological innovations ranging from a new spray/lighting system to an improved bur-locking system. Committed to safety, the EVO.15 gives progressive dental practitioners peace of mind in all situations.

For more information, please contact:
Bien-Air Dental SA
Länggasse 60, 2500 Bienne, Switzerland
dental@bien-air.com

W&H and Planmeca approach the Indian market together

By DTI

BANGALORE, India: European dental manufacturers W&H Dentalwerk and Planmeca have joined forces on the dental market in India. Comprising a shared office centre in Bangalore and a specialised customer service network, the collaboration between the two companies is aimed at exploiting synergies in offering a comprehensive and unique product portfolio to dental professionals in the country.

According to the companies, Bangalore was chosen in order to create a strong base for sustainable growth in the high-potential Indian market. Equipped with a state-of-the-art showroom and facilities for local customer support and service, the office centre, which began operating in November, will be an important contact point for Indian customers.

“With the local presence of our sales and service team we can establish a direct link to the Indian customers. This is an important basis to build up a good reputation and create confidence of our Indian users with the W&H and Planmeca products we sell,” said Ashok V. Radhakrishnan, W&H Managing Director for India. “We are extremely excited about this new partnership and the potential it offers in the growing Indian dental market.”

Commenting on the cooperation, W&H Managing Director Peter Alatia remarked: “The collaboration with Planmeca, also a family-run enterprise with advanced technology, allows for synergies of two strong brands. The purpose of establishing a subsidiary in India is to be able to learn first-hand the needs of dentistry in India. The sharing of office space and infrastructure by Planmeca and W&H will allow us to offer perfect solutions for dental clinics in India. This is what we strive for.”

“With the local presence of our sales and service team we can establish a direct link to the Indian customers. This is an important basis to build up a good reputation and create confidence of our Indian users with the W&H and Planmeca products we sell,” said Ashok V. Radhakrishnan, W&H Managing Director for India. “We are extremely excited about this new partnership and the potential it offers in the growing Indian dental market.”

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EMS at AEEDC 2017

By EMS

DUBAI, UAE: Preventive dentistry and oral hygiene was at the center of attention for visitors at the 21st AEEDC Exhibition and Conference in Dubai. Preventive dentistry is a growing field and EMS centers all resources on this topic to help dentists and clinics manage it in a professional way.

This greater emphasis on prevention will translate into fewer cavities and periodontal disease, and shorter treatment times.

As the global leader in Professional Prophylaxis and Periodontology, EMS launched the Guided Biofilm Therapy (GBT) concept in UAE and all GCC countries in during AEEDC.

The GBT concept was the central theme of EMS presence at AEEDC. This concept not only includes the most innovative and state-of-the-art products but also clinical protocols supported by scientific evidence.

The Swiss Dental Academy courses are also included in the concept. These renowned courses cover clinicians a complete education on how to use the latest methods and products to deliver effective and comfortable results to patients.

Learn more about this innovative concept today or register for a Swiss Dental Academy course! Contact your local authorized EMS distributor or email Mr. Hans Obermeier, your regional EMS representative via hobermeier@ems.ch.com.

The lucky winner of the raffle for an EMS Handy 3.0 Pento is Dr. Zaher from UAE. He is looking forward to treating his patients with his new device and making them smile.

Raghavan Radhakrishnan, General Manager of the office centre in Bangalore, (left) and W&H Managing Director Peter Alatia. (Photograph: W&H)
MIND BLOWING
MyCrown

- Fully Integrated System
- Fast and Easy to Use
- Grow Your Clinic

Find out more on www.fonadental.com
The ProTaper® Upgrade: ProTaper® Turns to Gold

By Dentsply Sirona

ProTaper Gold™ is the latest addition to the world famous ProTaper® family developed by Dentsply Sirona Endodontics (formerly Dentsply Maillefer) in collaboration with international endodontic opinion leaders. This new solution comes in addition to the ProTaper Next™ offering and has been developed as an upgrade for our loyal ProTaper® Universal customers who do not wish to change their technique.

ProTaper Gold™ is an upgrade from ProTaper® Universal, keeping the same philosophy and technique as the first generation of ProTaper®, with strong additional benefits like extended flexibility and greater resistance to cyclic fatigue.

Same ProTaper® Philosophy
• Same sequence of shapers and finishers.
• Same rotary motion (compatibility X-Smart®, X-Smart® Plus and X-Smart IQ™).
• A complete solution with dedicated obturation products, including new variable tapered gutta percha points specially moulded to fit canals prepared with ProTaper Gold™ files.

Strong Additional Benefits
• Covers a wider range of canal morphologies thanks to:
  o Higher flexibility (new metallurgy): +24% on average vs. ProTaper® Universal files.
  o Increased memory shape and flexibility on all files.
• Reinforced safety for the patient thanks to:
  o Higher cyclic fatigue resistance: ProTaper Gold™ F3 file lasts x 2.6 times longer than a ProTaper® Universal F3 file. On average, all files last x 2.4 times longer than ProTaper® Universal files.
• No new shaping technique to learn, simply a better tool to do it with.

To learn more and try a sample, please contact your Dentsply Sirona representative.

Pink & White Aesthetics with BEAUTIFIL II

By Shofu

BEAUTIFIL II ENAMEL and GINGIVA from Shofu are developed as a complementary line extension of BEAUTIFIL II series to easily create life-like direct aesthetic restorations. A special one-push syringe ensures controlled dispensing of the smooth and creamy material that is easy to sculpt into fine details and re-create the surface textures seen in natural teeth & gums.

Integration of nanofillers and newly developed organic-inorganic filler complex into a unique silanized modified resin network imparts Beautifil II Enamel and Gingiva with exceptional handling characteristics, longer working time, high abrasion/wear resistance, stable shades, effortless and superior polish with sustained polish retention for lasting aesthetics. Shofu’s proprietary S-PRG fillers offer additional fluoride benefits and anti-plaque effect on the restoration surface.

BEAUTIFIL II ENAMEL is available in 4 naturally translucent and opalescent, Value based shades that facilitate life-like shade reproduction and value adjustment in the final restoration to meet individual clinical needs.

BEAUTIFIL II GINGIVA is available in 5 natural shade variations of pink to match all ethnicities and easily mimic patient’s individual gum while restoring areas with receded or missing gums/papilla, cervical defects, root caries/erosion, exposed PFM margins and abutments to achieve red and white aesthetic harmony.
03-04 Nov 2017 | CONFERENCE
03-04 Nov 2017 | EXHIBITION
03 Nov 2017 | DENTALL HYGIENIST SEMINAR
31 Oct-06 Nov 2017 | HANDS-OFF COURSES

9TH DENTAL FACIAL COSMETIC CONFERENCE & EXHIBITION

Joint Meeting with

6TH AAID GLOBAL CONFERENCE DENTAL HYGIENIST SEMINAR (DHS)

Hands-On Courses

Digital Smile Design Day 1 & Day 2
Dr. Eduardo Mahn, Chile

The New Concept of ABB - Certification Course
Dr. Andrew Wallace, UK

Non-Prep Veneers and Modified Non-Prep Veneers
Dr. Eduardo Mahn, Chile

Direct Veneers: How to Create the Right Shape...
Dr. Eduardo Mahn, Chile

Indirect Veneers
Dr. Munir Silwadi, UAE

Inlays, Onlays and Occlusal Veneers
Dr. Eduardo Mahn, Chile

Closing Diastemas and Correction of Peg Laterals
Dr. Eduardo Mahn, Chile

Veneers Vs Crowns: the Challenge in Smile Design
Dr. Eduardo Mahn, Chile

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The treatment of traumatic dental injuries

mCME articles in Dental Tribune have been approved by:
HAAD as having educational content for 1 CME Credit Hours
DHA awarded this program for 1 CPD Credit Points

By Dr Aeoge Sigurdsson, USA

When treating dental trauma, the timeliness of care is key to saving the tooth in many cases. It is, therefore, important for all dentists to have an understanding of how to diagnose and treat the most common dental injuries. This is especially critical in the emergency phase of treatment. Proper management of dental trauma is most often a team effort with general dentists, pediatric dentists or oral surgeons on the front line of the emergency service, and endodontic specialists joining the effort to preserve the tooth with respect to the pulp, pulpal space and root. An informed and coordinated effort from all team members ensures that the patient receives the most efficient and effective care.

Recently, a panel of expert members of the American Association of Endodontists prepared an updated version of Guidelines for the Treatment of Traumatic Dental Injuries. These guidelines were based in part, on the current recommendations of the International Association of Dental Traumatology (see www.iadtdental-trauma.org for more information). This article provides an overview of the AAE guidelines; the complete guidelines are available for free download at www.aae.org/clinical-resources/trama-resources.aspx. The benefit of adhering to guidelines for treatment of dental trauma was recently shown in a study by Bucher et al.1 The study found that, compared with cases treated without compliance to guidelines, cases that adhered to guidelines produced more favorable outcomes, including significantly lower complication rates. The study also found that early follow-up visits were essential to ensure prompt treatment of complications when they arose.2

Emergency care

Prior to any treatment, one must evaluate the injury thoroughly by careful clinical and radiographic investigation.

It is recommended to follow a check list to ensure that all necessary information regarding the patient and the injury is gathered, including:

1. Patient’s name, age, sex, address and contact numbers (include weight for young patients).
2. Central nervous system symptoms exhibited after the injury.
3. Patient’s general health.
4. When, where and how the injury occurred.
5. Treatment the patient received elsewhere.
6. History of previous dental injuries.
7. Disturbances in the bite.
8. Tooth reactions to thermal changes or sensitivity to sweet/acid.
9. If the teeth are sore to touch or during eating.
10. If the patient is experiencing spontaneous pain in the teeth.

Once all of this information is gathered, a diagnosis can be made and appropriate treatment rendered. If the injured individual is not a patient of record, all necessary demographic information should be gathered as soon as the patient arrives and prior to any assessment.

In the case of avulsion and the tooth being out of its socket, one should immediately place the tooth in a physiological solution of specialized media (such as Hank’s Balanced Salt Solution) or milk, or saline if those are not available. Only after the tooth is secured in solution should one obtain the patient’s information. Once the patient is seated in the dental chair, it is necessary to do a quick central nervous system (CNS) evaluation before proceeding with further assessments.

Often, the dentist is the first health care provider to see the patient after a head injury (any dental trauma is, by definition, a head injury) and must assess the risk of concussion or hematoma. It has been estimated by a meta-analysis that the prevalence of intracranial hematoma after a mild head injury is 8 percent, and the onset of symptoms can be delayed for minutes to hours.3 The most common signs of serious cerebral concussion or hematoma are loss of consciousness or post-traumatic amnesia. Nausea/vomiting, fluids from the ear/nose, situational confusion, blurred vision or unsteady pupils, and difficulty of speech and/or slurred speech may also indicate serious injury.4

Once the patient has been cleared of any CNS injuries, the dental trauma should be assessed. The key is to obtain comprehensive information about the injury and, to do so, one must conduct thorough extra-oral and intraoral clinical exams as well as appropriate radiographic evaluations.

The new AAE guidelines recommend taking one occlusal and two periapical radiographs with different lateral angulations for all dental injuries, including crown fractures. If cone-beam computed tomography is available, it should be considered for more serious injuries, such as crown/root and alveolar fractures, as well as all luxation injuries.

Table 1. Follow-Up Procedures for Fractured Permanent Teeth and Alveolar Fractures

<table>
<thead>
<tr>
<th>TIME</th>
<th>Uncomplicated</th>
<th>Complicated</th>
<th>Uncomplicated</th>
<th>Complicated</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 Weeks</td>
<td>Clinical and radiographic control</td>
<td>Clinical and radiographic control</td>
<td>Clinical and radiographic control</td>
<td>Clinical and radiographic control</td>
</tr>
<tr>
<td>4-8 Weeks</td>
<td>Clinical and radiographic control</td>
<td>Clinical and radiographic control</td>
<td>Clinical and radiographic control</td>
<td>Clinical and radiographic control</td>
</tr>
<tr>
<td>4-8 Weeks</td>
<td>Clinical and radiographic control</td>
<td>Clinical and radiographic control</td>
<td>Clinical and radiographic control</td>
<td>Clinical and radiographic control</td>
</tr>
<tr>
<td>4-8 Weeks</td>
<td>Clinical and radiographic control</td>
<td>Clinical and radiographic control</td>
<td>Clinical and radiographic control</td>
<td>Clinical and radiographic control</td>
</tr>
<tr>
<td>6 Months</td>
<td>Clinical and radiographic control</td>
<td>Clinical and radiographic control</td>
<td>Clinical and radiographic control</td>
<td>Clinical and radiographic control</td>
</tr>
<tr>
<td>1 Year</td>
<td>Clinical and radiographic control</td>
<td>Clinical and radiographic control</td>
<td>Clinical and radiographic control</td>
<td>Clinical and radiographic control</td>
</tr>
<tr>
<td>1 Year</td>
<td>Clinical and radiographic control</td>
<td>Clinical and radiographic control</td>
<td>Clinical and radiographic control</td>
<td>Clinical and radiographic control</td>
</tr>
<tr>
<td>1 Year</td>
<td>Clinical and radiographic control</td>
<td>Clinical and radiographic control</td>
<td>Clinical and radiographic control</td>
<td>Clinical and radiographic control</td>
</tr>
</tbody>
</table>

*Tooth removal in case of third and real root fractures; **Tooth removal with a root fracture near the cervical area

The answers and critiques published herein have been checked carefully and represent authoritative opinions on the questions concerned.

Articles are available on www.cappmea.com after the publication.

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FOR INTERACTION WITH THE AUTHORS FIND THE CONTACT DETAILS AT THE END OF EACH ARTICLE.
Table 1: Follow-Up Procedures for Fractured Permanent Teeth and Alveolar Fractures

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical and radiographic examination</td>
<td>6-8 Weeks</td>
</tr>
<tr>
<td>Splint removal*</td>
<td>As needed for 2 weeks</td>
</tr>
</tbody>
</table>

- **Clinical**
  - If the pulp is not exposed, all accessible exposed dentin areas should be protected in the same fashion as complicated crown fractures.
  - If it is not exposed, all accessible exposed dentin areas should be protected in the same fashion as complicated crown fractures.
  - If it is not exposed, all accessible exposed dentin areas should be protected in the same fashion as complicated crown fractures.

- **Radiographic**
  - At four-month recall, internal root resorption was noted, but no definitive root filling was performed, indicating the necessity of a molar crown.
  - At five-month recall, no endodontic treatment was needed.

- **Surgical**
  - Surgical procedures may be necessary for teeth that are still movable after manipulations. In all types of trauma cases, a splint must allow for physiological movement.
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  - Surgical procedures may be necessary for teeth that are still movable after manipulations. In all types of trauma cases, a splint must allow for physiological movement.

**Clinical examples**
- Death trauma can be roughly divided into two groups: fractures and luxation injuries. The fractures are then either simple or complicated crown fractures, and root fractures. If the pulp is exposed to the oral environment, it is called a complicated fracture; if not exposed, it is called an uncomplicated fracture.
- **Crown fractures**
  - The fracture line may be in any crown or crown-root fracture is to look for the broken off tooth fragment.
  - With modern bonding technology it is possible to refit the fragment to the tooth, which is esthetically the best solution. Prior to refitting the tooth fragment, the remaining dentin needs to be immediately covering the pulp needs to be assessed radiographically and clinically and it is possible to do this if there are at least 1/3 of the crown.
  - If the pulp is not exposed, all accessible exposed dentin areas should be protected for the patient’s comfort.

- **Luxation injuries**
  - Intrusion of the tooth is intruded up to 7 mm, it is recommended to wait three weeks and watch for signs of re-eruption if any signs exist, one can initiate orodontic repositioning. For intrusion of more than 7 mm, surgical or orthodontic repositioning should be performed with in three weeks.
  - In the case of an intruded tooth with a closed apex, there is a possibility of re-eruption if the tooth is slightly intruded (less than 1 mm) and the patient is younger than 17 years old.
  - If the tooth is not moving after two or three weeks, however, orthodontic extrusion or extraction and reimplantation is recommended. If a tooth has been intruded more than 3 mm, orthodontic or surgical repositioning should be performed within three weeks.
  - The risk with all intrusions is that the intruded tooth may undergo ankylosis. Once that begins, the tooth may not be movable except possibly surgically. It is well to advise the patient and the parents/guardians that the long-term prognosis of an intruded tooth is unpredictable, as it is likely to eventually be lost due to ankylosis.

- **Avulsion**
  - Avulsion is the time outside of the socket for an avulsed tooth injury to the PREDICTED time of its survival. If the tooth is replanted within 30 minutes or alternatively if kept in a physiological solution of specialized media or milk for a few days, it may survive up to 10 days. If the tooth has been for more than one hour, the periodontal ligament will not be able to revascularize the tissue and the tooth will likely become nonvital within 7 days. The patient needs to be stabilized with a physiological splint for two weeks.

- **Endodontic treatment**
  - Endodontic treatment should be performed later only if signs of pulpal necrosis and/or resorption are frequently treated and are indicative of endodontic treatment.

**Table 2. Follow-Up Procedures for Luxated Permanent Teeth**

<table>
<thead>
<tr>
<th>Time (weeks)</th>
<th>Type of Injury</th>
<th>Concussion/Subluxation</th>
<th>Extrusion</th>
<th>Lateral Luxation</th>
<th>Intrusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Splint removal</td>
<td>Clinical and radiographic examination</td>
<td>Clinical and radiographic examination</td>
<td>Clinical and radiographic examination</td>
<td>Clinical and radiographic examination</td>
</tr>
<tr>
<td>4</td>
<td>Splint removal</td>
<td>Clinical and radiographic examination</td>
<td>Clinical and radiographic examination</td>
<td>Clinical and radiographic examination</td>
<td>Clinical and radiographic examination</td>
</tr>
<tr>
<td>6-8</td>
<td>Splint removal</td>
<td>Clinical and radiographic examination</td>
<td>Clinical and radiographic examination</td>
<td>Clinical and radiographic examination</td>
<td>Clinical and radiographic examination</td>
</tr>
<tr>
<td>6-8</td>
<td>Splint removal</td>
<td>Clinical and radiographic examination</td>
<td>Clinical and radiographic examination</td>
<td>Clinical and radiographic examination</td>
<td>Clinical and radiographic examination</td>
</tr>
<tr>
<td>1</td>
<td>Splint removal</td>
<td>Clinical and radiographic examination</td>
<td>Clinical and radiographic examination</td>
<td>Clinical and radiographic examination</td>
<td>Clinical and radiographic examination</td>
</tr>
<tr>
<td>2-5</td>
<td>Splint removal</td>
<td>Clinical and radiographic examination</td>
<td>Clinical and radiographic examination</td>
<td>Clinical and radiographic examination</td>
<td>Clinical and radiographic examination</td>
</tr>
</tbody>
</table>

**Table 3. Splitting Time for Various Types of Luxations**

<table>
<thead>
<tr>
<th>Type of Injury</th>
<th>Splinting Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subluxation</td>
<td>2 weeks</td>
</tr>
<tr>
<td>Extrusion</td>
<td>2 weeks</td>
</tr>
<tr>
<td>Avulsion</td>
<td>2 weeks</td>
</tr>
<tr>
<td>Lateral Luxation</td>
<td>2 weeks</td>
</tr>
<tr>
<td>Intrusion</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Root fracture</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Alveolar fracture</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Root fracture</td>
<td>4 months</td>
</tr>
</tbody>
</table>

### Clinical and radiographic examination

Fig. 4c: To reposition the tooth, it has to be released prior to moving the crown forward.

Fig. 5: Once the tooth has been repositioned, the patient bites into a softened wax plug that has been previously placed on the affected area. This allows the tooth to be replaced gently as soon as possible.

- **Clinical and radiographic examination**
  - Once the diagnosis is confirmed and the clinical and radiographic examination is performed, it is called a complicated fracture.
  - This process will increase its bone density and root resistance. Once the diagnosis is confirmed and the clinical and radiographic examination is performed, it is called a complicated fracture.
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Minimally invasive implant placement without the use of biomaterials using the bone expansion technique

By Dr Gilles Chaumanet, France

The success rate in implantology is close to 96 percent. Thanks to well-established implant placement protocols, a few differences according to the implant system used, the predictability of the result under optimum tissue conditions is quite significant. It is very different when these conditions do not meet the recognized standards in terms of volume and quality for reproducibility in implantology. For example, thin ridges, which are frequent occurrences, will require a long and costly process for patients because they entail bone augmentation or possibly support tissue grafts.

Is there a minimally invasive alternative for these patients that allows them to be treated without these problems? One line of thinking is to consider the biomechanical properties of bone tissue and its capacity to regenerate. Respected guiding regeneration principles, which means the implantation of physical barriers to isolate the epithelial and connective tissue cells from the operating site, enables regeneration of the different tissues.

The general surgical principle of modern implantology, called osteotomy, as close as possible to the dimensions of the implant that will be placed. This principle is still widely prevalent. However, soft-tissue management has evolved, and the trend is to use of osteotomes (a, b). Choice of healing screw that fits the diameter and height of the residual bone to be modelled (Fig. 1).

These principles are (Fig. 2):
1. Primary closure of the surgical site to enable undisturbed and uninterrupted healing.
2. Completion of the best possible angio genesis to provide the required vasculization and undifferentiated mesenchymal cells.
3. Creation and maintenance of a space to facilitate bone formation inside this space.
4. Stabilization of the surgical site to induce blood clot formation and facilitate healing.

Thanks to the careful choice of the healing screw or the implant abutment/temporary crown pair, these two entities with different regeneration potentials can be hermetically separated, thereby avoiding cell competition, which we know contributes to the growth of epithelial cells which develop more rapidly.

Case 1
The patient presented with a fracture of #16 (Fig. 3) and periapical cysts. With the patient’s consent, the decision was made to perform an extraction, debridement, socket decontamination and immediate placement of a non-submerged implant (implant and healing screw) using Summers’ method (crestal sinus lift). The patient was on standard premedication with amoxicillin and corticosteroids.

The #16 was carefully extracted by radicular separation to avoid bone fracture especially in the vestibule where the cortical bone is very thin. The lamina dura, which enables the attachment of collagen and Sharp-ey’s fibres, presents a high potential for contamination. Consequently, a light manual curettage of the socket was carried out, followed by a superficial debridement (vaporisation) of the entire ‘lamina dura’ with an Erbium laser (2,940 nm) followed by decontamination with a diode laser (940 nm).

This was a flapless surgery. The expansion osteotomy was performed through the inter-radicular septum. It was initiated with a very thin manual bone tap (pointed) and then an automatic mechanical osteotome (Figs. 4-5) (Osteo Safe®-Anthogyr) was used. The use of convex inserts in the beginning enables lateral expansion of the native or healed bone and then concave inserts during the breaking of the last sub-sinus millimetre, enables lateral bone recovery of this bone socket while projecting it apically.

During sinus progression PRF membranes (or native collagen membranes) are placed in the osteotomy opening to fill the intra-sinus space that is thereby gained (they also provide protection of the sinus membrane).

The Erbium laser is again passed through the osteotomy socket to vaporize the bone debris and sludge along the walls of this osteotomy. The implant is placed according to the manufacturer’s recommendations but with an even slightly higher torque if the titanium grade so allows. A healing screw that fits the diameter and height of the residual gap to be closed is carefully chosen (Fig. 6).

If the healing screw does not enable primary closure of soft tissue, PRF membranes are used to fill the gap. If this gap is too big, a mucoperiosteal detachment of 6-10 mm and then a horizontal incision of the peristium of 6-8 mm are made. This technique serves to pull the gum around the healing screw by maintaining it with two sutures. The control X-rays clearly showed good osseointegration of the implant, significant filling and regeneration in only three months, and then perfect filling and regeneration four months after surgery.

The bone remodeling around and above the implant neck also seemed...
to be well executed. The cone beam 3-D imaging in the first place showed a healthy sinus without inflammation or infection as well as bone reconstruction at the apex and around the implant (Fig. 7-8).

In the case of a trans-alveolar sinus lift combined with the placement of an implant by bone expansion, convex-tipped inserts should be used first to enable lateral expansion, and then conical inserts enable scrap- ing of the bones of the lateral walls of the ostectomy to enable apical projection after breaking the last millimeter under the sinus floor. If a mandibular implant is to be placed completely in native bone, convex inserts suffice. The last insert that is placed is smaller in diameter than the implant that is chosen.

The advantage of this technique was noted starting in 1996 by Summers himself with the use of conical osteotomes as opposed to cylindrical os-

Fig. 12. Laser denervation

Fig. 13. Use of OdontoSpine™ in the extraction socket after detachment and decontamination

totomes, which were all that were available up until then. The idea was actually to enable lateral peri-implant bone conduction in order to increase noto- bly, primary stability and compensate for the lack of vertical dimension of the sub-sinus native bone.

The objective of this technique is to maintain, if possible, the entire maxillary bone by laterally pushing back the bone with minimal trauma while creating a precise osteotomy that breaks the last millimeter of the sinus floor while protecting the si-

nus membrane. The consequence is the notable increase in peri-implant bone density with a high elevation of BIC (Bone Implant Contact) and, therefore, bone stability.

Fig. 14. Positioning of the implant

Case 2

The patient presented with a fracture of #24 with significant periodontal in-

fection (Figs. 9-10). It was decided that an extraction would be performed with immedi-

ate placement and loading of an implant after complete decontami-

nation of the extraction socket using lasers (Figs. 11, 12). Next, OsteoSafe® was used (Fig. 13) to enable gentle trabecular expansion and placement of a self-tapping conical implant (Anatomic Taper® Anthogyr).

In this case, where bone re-

covery along the ostectomy walls was not necessary, only convex inserts were used. The palatal and subcemental portion of the implant is respected (Fig. 14). The gap between the implant and the vestib-

ular cortical bone is not filled. Care-

ful choice of the implant abutment is crucial for the integration and function of the basic principles of this bone regen-

eration is respected, the conditions are adequate enough to enable bone growth without the use of biomate-

rials. These advantages are decisive due to immediately after reimplantation of the tooth, it is usual for resorp-

tion to be well executed. The cone beam 3-D imaging in the first place showed a healthy sinus without inflammation or infection as well as bone reconstruction at the apex and around the implant (Fig. 7-8).

In the case of a trans-alveolar sinus lift combined with the placement of an implant by bone expansion, convex-tipped inserts should be used first to enable lateral expansion, and then conical inserts enable scrap- ing of the bones of the lateral walls of the ostectomy to enable apical projection after breaking the last millimeter under the sinus floor. If a mandibular implant is to be placed completely in native bone, convex inserts suffice. The last insert that is placed is smaller in diameter than the implant that is chosen.

The advantage of this technique was noted starting in 1996 by Summers himself with the use of conical osteotomes as opposed to cylindrical os-

Fig. 17. Permanent crown at three months

totomes, which were all that were available up until then. The idea was actually to enable lateral peri-

Implant bone condensing

implant bone at the apical zone.

The gap is filled by slightly compressing the marginal gum (Fig. 15).

It is mounted out of functional oc-

clusion. Of course, the patient was advised to avoid voluntary chewing on this implant and only use local cleaning with cotton soaked in Chlor-
xellidine.

Following verification of the oste-

tosynthesis (Fig. 16), the impression was made eight to 10 weeks after sur-

gery, followed by placement of the permanent prosthesis (Fig. 17).

Conclusion

The implant placement technique with the use of osteotomes is not a new concept. On the other hand, using an automatic osteotome pro-

vides a better view of the site and makes it possible to practice flapless surgery, to position more precisely and obtain more homogeneous progression, in comparison to us-

ing bone taps with a surgical mallet.

From the patient’s perspective, sur-

gery, followed by placement of the permanent prosthesis (Fig. 17).

Conclusion

Traumatic dental injuries present dif-

cult challenges for both patients and their dentists. Current evidence allows the dental health care provid-

er to manage situations that, in the past, often resulted in crippled den-

tures and unsightly appearance. App-

ropriate treatment can turn what at first glance looks like a hopeless situation into a very satisfactory out-

come for patients. The endodontic specialist can play an important role in the team approach to treating pa-

ents with traumatic dental injuries.

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ontology. He is president of SLA France (Société Francaise pour l’Orale Laser Application), ambassador of Global Oral implant-winning, Crepi R, Cappatti P, Gher-

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Editorial note: The full list of referenc-

es available from the publisher.

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He is active in many professional organi-

zations and is past president of the Inter-

national Association for Dental Trauma-

ology (IADT). He received the Edward M. Oertel Educator Award from the Ameri-

can Association of Endodontists in 1998.
Beverly Hills Formula Black Toothpastes Proven to Give the Whitest Smile

Beverly Hills Formula Black toothpaste range ranks highest in stain removal after 5 minutes of treatment against other leading brands

By Beverly Hills Formula

Having a beautiful white smile is something most people aspire to achieve through the use of advanced whitening products and treatments, and more and more people are looking for inexpensive, safe and reliable products to help them acquire a cleaner, brighter smile for home use.

Beverly Hills Formula (BHF) is a brand synonymous with that perfect ‘Hollywood smile’. In existence for over 20 years, the company has dedicated itself to giving customers healthy and effective oral hygiene products which actually do the job of making teeth whiter through the use of its powerful stain removal ingredients.

Recent independent research has indicated just how effective Beverly Hills Formula products are at stain removal with several of its leading ‘black’ whitening products rated highest in stain removal compared with other brands; see chart.

A game changer for the oral hygiene market, the introduction of Beverly Hills Formula Perfect White Black Toothpaste in 2013 was the first ever black whitening toothpaste to hit UK shelves. Scientifically formulated with Activated Charcoal which is known for its love of tannins – a compound found in coffee, tea, wine, berries and spices, all of which stain your teeth. This toothpaste also helps eliminate bacteria which causes bad breath and neutralises remaining odours, leaving breath feeling fresh all day long. Most importantly, Beverly Hills Formula’s products are designed to provide maximum stain removal without damaging enamel, by using hydrated silica combined with Activated Charcoal it offers a high-performance whitening boost that is safe for daily use.

Following the overwhelming success of Perfect White Black, Perfect White Black Sensitive was launched and also scored highly for its stain removal properties. Designed specifically for teeth with extra sensitivity this stain removal toothpaste combines the advanced hydrated silica for high performance whitening and potassium citrate for rapid sensitivity action. So, Perfect White Black Sensitive toothpaste allows people to enjoy rich, acidic foods and drinks whilst leaving teeth looking whiter and brighter.

Beverly Hills Formula then ventured into new territory when they created the first black mouthwash. The ‘shake to activate’ charcoal mouthwash keeps breath fresh for up to 12 hours, whilst removing stains. Perfect White Black mouthwash was acknowledged at the Grocer Magazine Awards as the Best New Personal Care product in 2016. The highly prestigious Grocer Awards celebrates and rewards outstanding innovation in the UK’s Fast Moving Consumer Goods sector in non-food and food categories.

New Professional White

The recently launched Professional White range that was showcased at this year’s International Dental Exhibition (AEDIC) in Dubai, also came out on top of the chart for stain removal. Incorporating their latest black toothpaste, Black Pearl, the new products have been in development for two years and aim to provide premium professional oral hygiene products that offer superior results.

The new Beverly Hills Formula Professional White range includes, Black Pearl whitening toothpaste, Pink Pearl Sensitive whitening toothpaste, Precious Pearl Enamel remineralising toothpaste and Fresh Pearl mouthwash containing chlorhexidine and xylitol to combat bad breath and neutralize the bacteria. In addition, is their first Professional White teeth whitening kit consisting of strips and a whitening pen which will help people achieve a whiter smile, safely and easily in their own home using proven whitening ingredients.

Chris Dodd, CEO of Beverly Hills Formula, which is based in Ireland and distributed in over 30 countries, said: “We are very excited about our new Professional White range which has taken over two years in development, but it’s been well worth it because we believe we’ve created the best teeth whitening products which aren’t harmful to enamel and are aimed at consumers who expect superior results from a whitening toothpaste.”

![Ranked percentage stain removal following 5 minutes of treatment](image-url)

**July 2016**
PINK and WHITE Aesthetics

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Interview: "Dubai Health Authority strives on the values of community wellbeing..."

By Dental Tribune MEA / CAPPmea

During this year’s World Oral Health Day, Dental Tribune MEA had an opportunity to talk to Dr. Hamda Sultan Al Mesmar, Director of Dental Services Department at Dubai Health Authority’s Primary Health-care Sector.

Could you please tell us why Dubai Health Authority is involved in World Oral Health Day and why is it so important for Dubai?

The dental services department at Dubai Health Authority identifies the need of enhancing awareness amongst school-going children to reduce the prevalence of caries. The World Oral Health Day (WOHD) is one of the many platforms we use to educate the public on the importance of good oral hygiene.

In addition, World Oral Health Day is celebrated globally every year on 20th March. It is an international day to celebrate the benefits of a healthy mouth and to promote awareness of oral health.

How can dentists in Dubai increase their own involvement with WOHD?

The dental services department at Dubai Health Authority has the opportunity of reaching out to dentists during events such as the World Oral Health Day. Everyone in the dental health profession can make a difference to reduce the prevalence of caries in the Emirate.

Is there enough awareness amongst students in Dubai on oral health, or overall wellbeing?

There is a need to increase awareness amongst students within the Emirate. Based on the survey done by the dental services department in 2013, the prevalence of caries of school students aged 5 years old was 56%, and this can still be improved. The dental services department in Dubai will be an achievement.

What kind of impact does this day have on public in general?

The community has a great role in reducing the number of dental cavities among children.

Parents, guardians, school nurses, administrators are vital in playing the role of mentors and educators in imparting good knowledge of dental care among the children.

Smile Like You Mean It. Or do you?

New research from GUM® reveals embarrassment about teeth and gums causes Europeans to hide their smiles

By GUM Sunstar

When you want to make a great first impression on a date or a job interview, be sure to smile! Research shows that our smiles are our most powerful emotional tool and that when we have a bright, healthy smile we not only appear more likeable, we’re perceived to be more competent too.

According to a new survey from interdental cleaning experts GUM®, around half of men and women polled across Europe like their smile, but nearly a quarter of men and women in each country say they are most likely to cover their smile when they’re in front of their partner and just 46% would be embarrassed when talking to a relative.

Healthy mouth, healthy smile

The research also revealed that despite the majority of respondents agreeing that oral care is ‘extremely important’, only a handful of people are aware of the importance of cleaning in-between their teeth using interdental products such as floss and toothpicks.

In all three countries, around three quarters of people (75% in France, 68% in Spain and 72% in Germany) believe that brushing twice daily is the most important thing they can do to improve their oral health. At most half of the French polled (45%) do not use interdental products at all, while only around a fifth of Spanish (19%) and Germans (15%) use them every day.

In fact, although interdental products such as NEW GUM® Advanced Soft Picks® can dislodge food from between teeth quickly and easily, people tend to brush much less than the previous 30 seconds, with 75% in France, 68% in Spain and 61% in Germany claiming brushing is not effective for removing leftovers or that the bristles are too soft.

All those surveyed in France, Germany and Spain for the launch of NEW GUM® Advanced Soft Picks® agreed that they are most likely to cover their smile when they’re in front of an audience or trying to impress someone they’re talking to.

Worrying that their teeth are crooked and discoloured was the main problem for most respondents – but 31% of French said they were conscious of their gums, while around one third of French (30%) and Germans (33%) said they cover their smile because they worry something is stuck in their teeth.

First impressions count

The majority of those polled (36%) in France, 34% in Spain and 26% in Germany agreed that they would be most embarrassed about having leftovers in their teeth while giving a presentation at work, closely followed by being on a first date for the French (29%) and Germans (26%) and flitting with a potential date for the Spanish (18%).

Using NEW GUM® Soft Picks® Advanced offers an easy, safe and effective way to discreetly clean between teeth and remove unwanted food from your teeth, whether you’re at home or out and about. The new superior design offers improved comfort and control, making it easier to reach and remove plaque and food from even the hardest to reach teeth.

NEW Soft Picks® Advanced can be used discreetly to quickly get rid of stuck food on important occasions such as a business meeting or first date or anytime you want to give your mouth an extra clean and get back your natural confidence, smile without inhibitions and radiate the real you. Between your teeth can actually remove more bacteria than simply brushing. GUM®’s interdental range contains highly effective flossing and gum health products that can prevent, control and treat the gum and oral health issues that can compromise your smile – giving you back your confidence to smile like you mean it.

References
2. Atomik Research: survey of 1000 men and women in France, Spain and Germany.
3. Atomik Research: survey of 1000 men and women in France, Spain and Germany. Question 8 (29% of respondents in France and Spain and 35% in Germany do not like the alignment of their teeth, while 48% in France, 35% in Spain and 49% in Germany do not like the colour of their teeth).
4. Atomik Research: survey of 1000 men and women in France, Spain and Germany. Question 12 (52% of French, 13% of Spanish and 14% of Germans would feel embarrassed about having food in their teeth in front of their partner, while only 15% of French, 6% of Spanish and 4% of Germans would be embarrassed in front of a relative).
5. Atomik Research: survey of 1000 men and women in France, Spain and Germany. Question 9 (87% in France, 56% in Spain, 50% in Germany)
6. Atomik Research: survey of 1000 men and women in France, Spain and Germany. Question 11 (52% of respondents in France and Spain and 36% in Germany that they are self-conscious about their teeth and gums).
7. Atomik Research: survey of 1000 men and women in France, Spain and Germany.
8. Atomik Research: survey of 1000 men and women in France, Spain and Germany. Question 10 (42% in France, 33% in Spain, 26% in Germany).
Where are you?

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By Dental Tribune MEA / CAPPmea

DUBAI, UAE: In more than 100 countries around the world, World Oral Health Day (WOHD) is celebrated on 20th of March each year. The main initiative of FDI is primarily to promote oral health and increase public awareness. This is also the case in the UAE.

This year’s main theme is "Live Mouth Smart" – encouraging the public to regularly check their teeth and mouths. The World Oral Health Day was established to turn people’s attention to the need for prevention and treatment of diseases.

On this year’s World Oral Health Day (WOHD), Dania Hamda, President of GEMS Academy Silicon Oasis together with Dr. Hamda Sultan Al Mesmar, Director of Dental Services Department at Dubai Health Authority (DHA) and Dr. Vincenzo Ventricelli, Vice President Philips Health and Wellness welcomed 70 students at the GEMS Wellington Silicon Oasis School.

Mr. Damian welcomed everyone present on this special day and encouraged the students to participate in all the activities that have been organized. Mr. Damian encouraged everyone to focus on thinking about health and healthy living.

Dr. Hamda, from Dubai Health Authority during the event spoke about Dubai Smiles Healthy Award programme, which is a school based programme in line with Dubai’s 2021 vision to improve oral health and decrease the level of caries among the students of Dubai. In her speech, Dr. Hamda also explained to the children that "Live Mouth Smart" theme stands for brushing teeth twice a day, eating healthy, visiting dentist and dental hygiene regularly and to invest in a toothbrush which can remove up to ten times more plaque than a manual toothbrush. Additionally, all students were invited to participate in the Tooth Brushing Challenge and writing and drawing competitions.

After Dr. Hamda’s speech, Mr. Ventricelli, Vice President Philips Health and Wellness explained the role of Philips in World Oral Health Day Mr. Ventricelli mentioned that oral hygiene is a global challenge and Philips is supporting this celebration to improve the lives of people worldwide. He said that for each challenge you need a solution, and the solution for oral health is involvement of the community through education and proper oral health.

It is important that oral health is taken care of from childhood to adulthood, prevention is easier and less painful than treatment. Therefore Philips Sonicare together with Dubai Health Authority (DHA), Dentist Direct and GEMS Wellington Academy Silicon Oasis organized several activities for the children to increase the size on proper tooth brushing and the importance of establishing daily good oral hygiene habits.

Interview: "Tooth decay is the most common chronic childhood disease"

By Dental Tribune MEA / CAPPmea

Dental Tribune MEA / CAPP had the pleasure to interview Dr Shamsa Al Mahshidani from Dental Services Department at Dubai Health Authority (DHA) about World Oral Health Day 2017.

Dental Tribune MEA / CAPP mea: Could you please introduce yourself to our readers?

Dr Shamsa Al Mahshidani: I have been working at DHA for the past 6 years. I was involved in the planning and implementation of the first oral health survey for the Emirate of Dubai. After establishing a baseline for the level of oral health in Dubai, the next step was to set up a preventive program that would help in improving the level of oral health among the population of Dubai. I am very passionate about enhancing the level of oral health, especially among the students of Dubai and my dream is a starting point to make Dubai the caries-free students.

You have been working on the school prevention program for already 4 years. Could you please tell us more about it and what exactly is the idea?

Oral health care is a critical component of good health. Tooth decay is the most common chronic childhood disease: five times more common than asthma. Untreated tooth decay can lead to pain and suffering, affecting a child’s ability to talk, speak and focus at school, resulting in absence and affecting the ability to learn and to develop physically and psychologically.

Dubai Smiles Healthy is the first national preventive and community-based program implemented in the Emirate of Dubai designed to improve the oral health of children in Dubai. It is adapted from the Childsmile program of NHS Scotland and follows the World Health Organization recommendations for preventive care.

It was based on the screening program conducted in 2011 in Dubai. "Dubai Smiles Healthy" (2011) includes national and international recommendations for better preventive care, overall wellbeing and happiness of the community and serves the Dubai Health Authority’s vision to have a healthy and happy community.

It has three main components - Dubai Smiles Healthy: School Practice Program Preschools and Schools provide an important base to promote oral health as they reach large numbers of students who pass on these messages to their families. Schools can make a substantial contribution to a student’s health and well-being.

This has been increasingly recognised by many international initiatives including those from the World Health Organization (WHO), UNICEF and UNESCO. This means that the oral health messages rendered in schools will eventually reach the whole community. The early years of a child’s life is the most influential time to reinforce habits and attitudes, therefore targeting the students at this age with proper oral health habits will have a lifelong effect. They will be healthier and more productive individuals in their community, having better quality of life with a potential to long term cost saving.

Implementation of the school dental preventive programme includes the following steps:

- Mobile dental vans visit the schools according to a schedule during the school calendar year, to carry out dental screening.
- School oral health screenings provide parents with information about their children’s oral health and the importance of regular dental treatment.
- School screening data identifies areas with high levels of dental disease. Preventive interventions can be implemented in these targeted areas to improve the oral health of Dubai school children.

Dubai Smiles Healthy – School Nurse Training Program The school nurse training program is a national initiative of Dubai Smiles Healthy preventive program. It aims at creating a school nurse workforce with the competencies to prioritise oral disease prevention and oral health promotion. The overarching goal of this training is to create an oral health educational infrastructure for the school nursing profession that empowers the nurses in reducing oral diseases across Dubai schools.

Dubai Smiles Healthy - Child Health Program Dental hygienists have had these sessions after they undergo proper training and educational sessions. There are set guidelines that the hygienists must follow to have a unified message sent to the public.

Parent education on proper oral health is the essence of the sessions. They attend with their children from the age of 6-8 weeks. Education on how to care for oral health, healthy diets and lifestyle are all part of this step. From six months of age, dental hygienists provide regular checkups and fluoride application for these children. The role of the hygienist includes oral health advice (e.g. oral habits, diet, etc...), tooth brushing instructions and regular dental check-ups from the age of 18 months.

What was the focus of celebrating WOHD on 20th of March at GEMS Wellington College?

In line with this year’s World Oral Health Day theme, “Live Mouth Smart” Live Mouth Smart speaks to you about the decisions you can take to safeguard your own and your family’s oral health so you can enjoy a healthy mouth throughout life. It is time to acknowledge that the mouth plays a vital role for our physical and psychological health and how Dubai Smiles Healthy can reinforce and enhance the level of oral health and raise the awareness of the importance of maintaining good oral hygiene.

The focus this year was to emphasise on the link between general health and oral health. Can you tell us what is the Dubai Smiles Healthy Award about?

The Dubai Smiles Healthy Award was set up to achieve Dubai Health Authority’s (DHA) 2021 strategy to raise awareness of oral health, prevention and screening in line with the goal of the DHA Dental Services Department to reduce caries and improve general oral health levels amongst students in Dubai.

As part of the program, the DHA, in cooperation with the private sector, will visit schools to carry out dental checks on students. The purpose of the screening, which will be done at the beginning and after the Dubai Smiles Healthy Brushing Challenge finishes, is to determine if the oral hygiene level has improved.

Do you think there is enough awareness among students in Dubai on oral health, or overall well-being?

No, we are just starting our first steps, a recent pilot questionnaire answered by 580 mothers asking about their knowledge of oral hygiene showed that 67% of their children were not consistent in brushing their teeth. We must reinforce good oral health habits, emphasising tooth brushing and a proper healthy diet. Homes, schools and the public media should work hand in hand to help raise the awareness to eliminate this silent epidemic.
Philips Sonicare DiamondClean removes 7x more plaque than a manual brush and eliminates surface stains to whiten smiles in just one week. And with accessories like an innovative glass charger for home use and a portable charging case, it’s the jewel of our collection for good reason.

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Qatar: Masar Medical Pharmaceuticals, Hospital, Laboratory, Dental, Equipment & Supplies, Tel. +974-40160552

*Versus a manual toothbrush
2. Data on file, 2010
Surgical management of peri-implantitis

Specialist Periodontist, Dr Jeremy Vo, explains how he has embraced AIR-FLOW® technology in the management of Peri-Implantitis

By Dr Jeremy Vo

Surgical intervention is often required in the treatment of advanced peri-implantitis lesions. Peri-implantitis is defined as an inflammatory process around an implant, with soft tissue inflammation and loss of supporting marginal bone.1

The aim of surgical therapy is to allow access for the decontamination of implant surfaces which have been exposed to oral biofilms. Several approaches for implant decontamination have been described and can be broadly categorised to include mechanical, chemical and laser instruments.2

Mechanical removal of hard and soft deposits can be achieved with rubber cups, curettes, and/or ultrasonic devices.3 Curettes of different materials have been manufactured, specifically for the debridement of implant surfaces. These materials include steel, titanium, carbon-fibre, Teflon and plastic. Ultrasonic devices with polyethylene/keratone (PEEK) coated tips are also specific for implant surfaces.4 A more aggressive approach has been proposed which involves intentional removal of the implant threads. This is known as ‘implantoplasty’ and the aim is to produce a polished, smooth collar which better supports oral hygiene compared with the original rough surface of the implant.

Chemical decontamination is aimed at disinfecting the implant surface by direct application during surgery.5 Following elevation of the soft tissues, the implant surface can be rinsed with several different substances including chlorhexidine, sodium chloride, hydrogen peroxide and citric acid. Unfortunately, no chemical agent has shown superior results when compared with others.6

Laser decontamination - including the use of Er:YAG and CO2 lasers - have also been utilised during surgery in an attempt to improve clinical outcomes. The evidence is, however, weak and has not shown significant improvement when compared with conventional mechanical therapy.7

There are 3 main approaches for surgical intervention including 3:

**Access surgery**

The primary aim of access surgery is to decontaminate the implant surface.8 Commonly, intrasulcular incisions will allow the conservation of the soft tissues around the implant once the mucoperiosteal flaps are elevated. Infraled peri-implant tissues are degranulated and the implant surface is decontaminated. A clinical study with 5 years follow up reported complete resolution of advanced peri-implantitis lesions in 42% of implants and 65% survival of implants.9

**Resective surgery**

This surgical technique allows implant decontamination to take place, but rather than conserving soft tissues, a reverse bevelled incision combined with osteoplasty reduces the pocket depths around the implant.10 As a result, the neck of the implant is usually left exposed to the oral cavity and therefore, this technique is only suggested for implant defects in non-aesthetic areas. The 2-year outcome of resective peri-implantitis surgery found complete resolution of clinical signs of disease in almost 60% of implants.11

**Regenerative surgery**

Regenerative surgery is aimed at improving hard tissue integration around the implant by osteointegration, as well as remodelling recession of the peri-implant mucosa.12 Following mucoperiosteal flap elevation, the implant surface is decontaminated and the intrabony defect is degranulated. Various approaches to bone grafting have been described. Bone substitute materials such as Bio-Oss® (Geistlich Biomaterials) can be used to fill the intrabony defect which is then covered with a resorbable or nonresorbable membrane. A 4-year clinical study found significant reductions in probing pocket depth and radiographic defect fill with a regenerative technique involving Bio-Oss® and Bio-Gide®.13

**The clinical approach**

The development of biofilms on the implant surface plays a significant role in the initiation and progression of peri-implantitis diseases. The bacterial microflora is composed predominantly of Gram-negative anaerobes and is similar to microflora found around teeth with severe periodontitis. Unfortunately, in the management of peri-implantitis, no definitive gold standard has been identified for implant decontamination. Implant surface roughness and irregularities can enhance bacterial attachment and prevent adequate instrumentation. The tips of the curettes are often too large to reach the deeper parts of the threads.

Recently, a powered air-abrasive system utilising Erythritol (a sugar substitute) has been proposed as an effective method of biofilm removal from the implant surface that is safe on hard and soft tissues (EMS AIR-FLO® EL® or CA, Electro Medical Systems (EMS)).14 The abrasiveness of Erythritol is low and it does not cause extensive damage to the surface topography of the implant compared with the use of conventional steel curettes or ultrasonic. Furthermore, in vitro data suggests that it has an antimicrobial effect.15

Once the implant surface has been decontaminated, the morphology of the bony defect may help determine the most suitable surgical approach. Generally, if the defect is circumferential with intact bony walls, or has an intrabony component, the use of a regenerative approach will provide improved clinical outcomes. On the other hand, if the defect is supra-bony or the implant presents with some degree of bursal dehiscence, an apically repositioned flap would be indicated in these non-aesthetic areas.
The following case study illustrates a protocol that was used to treat advanced peri-implantitis. The case was treated successfully with a 6-month follow-up. Success was defined by a reduction in probing pocket depths (≥4mm), along with a reduction of soft tissue redness and bleeding on probing.

**Case Study: Regenerative approach for treatment of peri-implantitis**

A 70-year-old female was referred for advanced peri-implantitis in the mandible. She presented complaining of pain and she also noticed discharge from one of the anterior implants. Her medical history was non-contributory and she was a non-smoker.

Clinical examination revealed 5 implants in the mandible supportive of the removable partial denture. The distal implants had normal probing depths with an intrabony component of 6.1mm for the implant in the 35 position, 4.2mm at the 41 implant and 3.1 at the 33 implant.

A preoperative phase was carried out, including assessment of oral hygiene and non-surgical implant decontamination in 1 session. After 6 weeks, the patient underwent surgical treatment. This comprised of full thickness mucoperiosteal flaps being raised and the chronic inflammatory tissue removed from the defects around the 3 implants with the use of teflon curettes. The implant surface was then decontaminated using EMS AIR-FLOW® technology with very fine erythritol powder (EMS AIR-FLOW® PLUS Powder). The implants were also irrigated and cleansed with saline-soaked cotton foam.

A crater shaped defect was present around all the implants at the proximal and lingual surfaces, however the implants had a depressions on the buccal aspect. The craters were filled with Bio-Oss granules (Geistlich) and Bio-Gide was placed to cover the defects. Lastly, the flaps were reposi-tioned and secured with mattress and 3/0 sutures. Systemic antibiotics were administered postoperatively. The full arch prosthesis was re-issued at the completion of surgery.

Clinical parameters and radiographie examinations were performed at 3 and 6 months. At both intervals, there was resolution of the clinical parameters for all 3 implants, including plaque index, bleeding on probing and probing pocket depth. At these visits, non-surgical maintenace was carried out, including oral hygiene reinforcement and removal of biofilm via EMS AIR-FLOW® technology and EMS AIR-FLOW® PLUS Powder.

**References**


The Concept of Progressive Smile Design

Dr. Tif Qureshi, Past President of the BACD and Director of IAS Academy, shows how a step-by-step approach to smile design can make things simpler and safer and is something many dentists can do.

By Dr. Tif Qureshi, UK

While I have been publishing articles on Progressive Smile Design for the past six years (1,2), this is a concept I actually discovered in 2006. However, while attending many conferences and witnessing fierce debates on Facebook, it has become clear to me that its potential significance has not quite yet sunk in amongst many practitioners of aesthetic and cosmetic dentistry.

It is also true that the subject of smile design commonly polarises readers. Some will think they know it all already, while others will think it is not relevant to their practice.

I’m hoping to prove both groups wrong by provoking some debate, focusing on three suggestions that I truly believe:

1. Every single dentist could carry out simple forms of aesthetic dentistry that can have dramatic effects with minimal risk.
2. Smile Design planning, as it has been known, is taught is back to front (I’ll explain this later) and only serves a niche market, which is disconnect-ed from most dentists.
3. The tools are now available for any dentist to create beautiful smiles without picking up a drill.

I would argue that cosmetic dentistry has traditionally focused on large, high-end cases and that this has actually been a very shortsighted approach. It effectively became a very well-publicised niche market that very few patients could afford. This also means that very few dentists have the option to offer this treatment, since many patients simply do not have the budget or, indeed, do not want to take the risk.

With Progressive Smile Design, a much wider range of patients could potentially be treated by a much larger number of dentists at much lower risk.

Traditional smile design focuses on an endpoint — now processed in a digital manner via computer software. This is translated to a wax-up and the patient is shown what could be achieved. This can even be tried in the mouth with a stent made from the wax-up.

Often, ideal smile design parameters are built into this set-up so a patient will commonly be shown their appearance with 8-10 different units in their mouth via simulation or a trial smile. These parameters will include golden proportion, connector harmony, wider bucal corridors, perfect incisal outlines and correct gingival zeniths.

But, if a patient is shown this at the start point, they will naturally assume that this is what they want. Irreversible treatment is then commonly carried out to achieve this, using porcelain, composite veneers or even no-prep veneers.

Currently, many patients are having the concept of no-prep, minimal prep or composite veneers promoted to them as the way to achieve a perfect smile. The big question is: Do these people really need these techniques at all?

Digital smile design, as clever as it is, does not allow patients to see small, in situ changes and, more often than not, means a patient will opt for a far more dramatic treatment plan than may actually be required to make them happy. Based on the huge number of cases I have been involved in, patients who initially thought they wanted ideal smile design changed their minds after seeing their teeth aligned/whitened and after receiving edge additions.

The cynical will commonly say, “Im-proving smiles in any way at all is completely unnecessary,” but that not only shows ignorance of the wishes of many patients, but also of the fact that restoring a smile can often have significant functional benefits.

In practical terms, we, as dentists, also commonly ignore factors beyond the purely clinical. Dentists are trained to make clinical judgments. Psychological and long-term judgments are not always discussed and/or have not, historically, been well-researched in dentistry.

In 2006, I actually discovered in 2006. How-ever, while attending many conferences and witnessing fierce debates on Facebook, it has become clear to me that its potential significance has not quite yet sunk in amongst many practitioners of aesthetic and cosmetic dentistry.

I’m hoping to prove both groups wrong by provoking some debate, focusing on three suggestions that I truly believe:

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Digital smile design, as clever as it is, does not allow patients to see small, in situ changes and, more often than not, means a patient will opt for a far more dramatic treatment plan than may actually be required to make them happy. Based on the huge number of cases I have been involved in, patients who initially thought they wanted ideal smile design changed their minds almost without fail, once they start to align/bleach and bond their teeth. They are commonly happy to accept compromises which they would not have appreciated if they had gone straight ahead to a final 8-10 unit result. Given the short amount of time required for Anterior Ortho cases, it is essential that patients fully understand these options, in order to make an informed choice. The argument of, “Patient did not want ortho,” simply does not wash, if it is later discovered that the only option they were given was a comprehensive one that might take a year or more.

**Case**

At one point, this patient had considered ceramic veneers to improve her smile, but was concerned about the amount of preparation needed. As a result, she was happy to try aligning and whitening her teeth beforehand.

**Assessment**

- Pt 25
- Skeletal 2

**Diagnostic Photoguide 001**

- Decreased FPA
- Canine Class
- Molar class 3/4 unit class 2 RHS mollar class 3/4 unit class LHS
- Incisor class 1 div 2 75% 08 and 49mm 01
- Upper laterals crowded centre lines coincident
- Soft tissues NAD, symmetrical, lips competent High lip line
- Lower face height slightly reduced
- No TMJD
- Canine guidance positive
- No Posterior interference on the anterior slide

On examination, her upper teeth were slightly retruded and the edges were chipped. Slightly worn, irregular lower edges on the lower teeth were causing chipping on the upper teeth because of some para-function.

All possible options were discussed with the patient, including a ceramic solution or orthodontics. All avail-

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**Images:**

- Pic 1: Before side retracted view
- Pic 2: Right side retracted view after alignment and whitening (20 weeks)
- Pic 3: Before upper model
- Pic 4: After 3D Print
- Pic 5: Before Upper Occlusal View
- Pic 6: After upper Occlusal View and Bleaching (20 weeks)
- Pic 7: After wire retainer
- Pic 8: Right side view before
- Pic 9: Wearing 46 Superners
- Pic 10: Right side retracted view after alignment and whitening (20 weeks)
- Pic 11: Right Side after edge bonding
- Pic 12: Front view
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Hands-on: Reciprocating NiTi and Carrier based thermoplastic obturation techniques.

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Hands-on: Placement of core restorations and post retained restorations.

Module 6 | 4 days | Management of Endodontic Failure
Programme outline: Endodontic retreatment, surgical endodontics.

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able orthodontics solutions were offered to the patient, including a referral to a specialist. A choice between a comprehensive plan and a compromise was offered, with the compromise plan including fixed, clear aligners and Inman Aligners. She decided that she did not want comprehensive treatment and chose the limited goal of anterior tooth alignment can actually be achieved far more quickly with many forms of orthodontics appliances than they might think. In this patient’s case, if she had expected the orthodontics to take a year, she would have chosen veneer preparations to save money. She could see her teeth in a comprehensive plan and chose to do this to avoid any tooth preparation, but to still have veneers any-

The upper teeth had exactly 1 mm of crowding, so IPR was carried out progressively over 3 appointments with strips, using the Super Slim Inman Aligner 16 hours a day. The lower teeth were aligned with a single Inman Aligner, also in 10 weeks. At week 8, simultaneous bleaching was started with 6% Daywhite by Phillips: using super-sealed trays and technique to ensure the teeth were dry before the trays were placed. This consisted of 2 weeks of day time whitening, 2 x 30 minute sessions a day while the IA was out. At week 10, alignment was virtually complete and, post-alignment and whitening, the patient very quickly decided against ceramics because the tools are now widely available: various forms of tooth alignment tools, suitable for a range of cases, effective whitening preparations and ideal, easy to use bonding materials. Given the current debate on tooth preparations, one must always consider what the patient is aware of. Orthodontics is not a binary solution; there are millions of potential outcomes that vary with time, teeth to be moved, and distance to be moved. Patients who chose veneers because they assume ortho will take a year or so must be aware that anterior tooth alignment can actually be achieved far more quickly with many forms of orthodontics appliances than they might think. In this patient’s case, if she had expected the orthodontics to take a year, she would have chosen veneer preparations. By having a limited goal, we were able to completely eliminate any tooth preparations altogether.

Discussion

The patient was delighted with the results as the treatment had effectively made her own teeth look better without removing any real tooth structure. The treatment also cost her far less financially and biologically, but still achieved a result she was more than happy with.

Conclusion

What could have been a complex ceramic case, only affordable for a tiny percentage of patients and only carried out by a minority of dentists, instead turned into a simple alignment, bleaching and edge bonding case that would be far more affordable for many more patients and would be achievable for many more dentists.

This is because the tools are now widely available: various forms of tooth alignment tools, suitable for a range of cases, effective whitening preparations and ideal, easy to use bonding materials. Given the current debate on tooth preparations, one must always consider what the patient is aware of. Orthodontics is not a binary solution; there are millions of potential outcomes that vary with time, teeth to be moved, and distance to be moved. Patients who chose veneers because they assume ortho will take a year or so must be aware that anterior tooth alignment can actually be achieved far more quickly with many forms of orthodontics appliances than they might think. In this patient’s case, if she had expected the orthodontics to take a year, she would have chosen veneer preparations. By having a limited goal, we were able to completely eliminate any tooth preparations altogether.

Acknowledgments

Inman Aligner supplied by IAS Ortho Lab Super Slim

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Editorial note: The full list of references are available on request.

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Periodontal Plastic Surgery: Treatment of a Gingival Recession using a Tunnelling Technique, Connective tissue graft and amelogenins
A clinical case report

By Dr. Laura Delgado Rodriguez, Spain

Abstract
The therapeutic approach to gingival recession requires a treatment plan involving basic therapy, which will focus on its etiologies and the most suitable periodontal plastic surgery treatment in each specific case. The Oral Biofilm control, previous periodontal stabilization, the use of magnification and microsurgical instruments to handle the tissues, bilaminar blood supply for the connective tissue graft, the release of the lower anterior frenulum, the root conditioning with enamel matrix derivative proteins, suture without tension and patient cooperation were key factors in the treatment outcome obtained. The aim of this paper is to present a clinical case of a gingival recession defect treated using a tunnelling technique with a connective tissue graft and amelogenins and its evaluation.

Introduction
Gingival recession (GR) has been defined as the exposure of the tooth root caused by the migration of the gingival margin to a point apical to the cemento-enamel junction. It can appear in its localized or generalized form and frequently compromises dental and gingival aesthetics, and causes dental hypersensitivity (1,2).

GR has a multifactorial etiology associated with different types of factors that aid their development. It has been demonstrated that at least four groups of factors can be associated with the development of GR: anatomical factors (lack of keratinized gingiva, muscle insertion close to gingival margin, inadequate tooth alignment, thin or absent vestibular table, prominent root); factors relative to inflammatory disease (Gum disease because of plaque build-up, Periodontitis); factors relative to iatrogenesis (e.g. prosthetics, orthodontic treatment); factors relative to trauma (traumatic brushing or other mechanical traumas) (3).

The elimination of causal factors and the detailed explanation provided to the patient are as important as the periodontal plastic surgery technique to implement (4-6).

According to the first European Periodontal meeting consensus in 1994 the indications for GR treatment are:
- Improvement of oral hygiene (prevention of gingivitis and root caries);
- Esthetic or orthodontic concerns;
- Hypersensitivity.

The root exposed in a GR is not necessarily compromising the tooth survival if the remanent bone is preserved and the oral biofilm is controlled. However, from a periodontal point of view, it is indicated to treat it when is progressive and/or difficult a correct oral hygiene (Freedman and cols, 1999).

In the last decades many surgical techniques for the treatment of GR have been developed (Sullivan & Atkins 1968, Langer & Langer 1985, Raetzke 1985, Allen 1994, Zabalegui 1999 among others).

The most widely accepted classification of gingival recession is Miller’s. It is based on the most apical gingival margin of the recession regarding the mucogingival junction, and on the amount of tissue loss (gingiva and bone) in interproximal areas adjacent to the recession site (7).

Complete coverage is achieved when the gingival margin is placed at the same level as the cemento-enamel junction, the gingival sulcus has a probing depth lower than 2 mm and when there is no bleeding on probing (8). The outcome of surgical treatment of gingival re-
The surgical technique selected was a tunnel-flap technique (MCAT) + connective tissue graft (subepithelial) + enamel matrix derivative proteins (Straumann Endrogide) to treat a multiple lower anterior gingival recession.

Clinical case description

A systemically healthy 35-year-old female patient, a nonsmoker, was referred to our Clinic. Her chief complaints were root sensitivity, discomfort and pain when brushing the lower anterior teeth.

The patient underwent orthodontic treatment between 2003 and 2009. The symptoms she relates started after such treatment. Upon examination, the following was observed on lower anterior sextant:

- Miller's Class II gingival recession in tooth #31 that showed a 2.50 mm width and 4 mm depth. Class I 1.43 mm, showing 2 mm x 2 mm. Localized gingival inflammation and tartar accumulation in the root surface #31.41.
- Periodontal biopsy; Lack of attached gingiva.

Diagnosis and suggested treatment plan was explained in detail to the patient. Basic periodontal therapy and periodontal plastic surgery - Modified coronally advanced tunnel technique (MCAT) in this case (Jahr et al. 1999, Arco et al. 2010, Sculean et al. 2014, 2015) + connective tissue graft and enamel matrix derivative proteins. Other grafting material options such as xenografts and allografts were discussed.

The basic therapy included:

- Instructing the patient regarding dental plaque control, tartar removal.
- Good oral hygiene habits.
- Root conditioning using EDTA 24% 2 minutes.
- Root coverage procedures: Practical applications.等内容。

The patient was instructed to brush thoroughly 600x2 minutes before surgery, 6 hours after and every 12 hours as necessary during the following days and to use mouth-rinse (0.12% chlorhexidine digluconate) twice a day for 15 days. Sutures in the donor area were removed after 1 week and all the rest 14 days after the procedure.

The patient was followed up weekly during the first month and monthly up to the third month. Healing was uneventful. The patient did not report pain or major discomfort during the postoperative period. The color of the tissue was homogenous 2 weeks following the surgical procedure (Fig. 10). Six months after the treatment, gingival stability and thickness seem adequate, which shows good hygiene of the sector and gingival tissue stability achieved with the graft (Fig. 12, 13).

Conclusions

Successful treatment outcomes require the management of all the etiological factors. Basic periodontal therapy is fundamental when treating gingival recession. Appropriate oral hygiene techniques should be implemented. In cases where the recession causes aesthetic concerns or root hypersensitivity, surgical treatment should be recommended. Subepithelial connective tissue grafts are the gold standard in periodontal plastic surgery as they modify tissue thickness, increase keratinized gingiva and improve root coverage. The MCAT can lead to predictable recession coverage of single and multiple recessions. Periodontal maintenance is essential to avoid inflammatory events which might increase recession recurrence.

References

The Minimal Invasive Smart Smile Design

By Asst. Prof. Dr. Cagdas Kislaoglu, Turkey

We live in an era where patients are becoming more specific about how they would like their anterior teeth to be restored. Not only are they requesting an aesthetic solution to their dental problems, but they are also seeking procedures that will have a limited effect on the remaining tooth structures. Porcelian Laminar Veneers are one of the most conservative and aesthetic techniques that we can apply. The life span of the veneers is long and they are durable, especially if the right indications are chosen and the correct techniques are applied. The most important thing is the conservation of sound tooth structure, so we should limit our preparations on enamel. When we limit our preparations on enamel, the tooth will not flex and it will stay as rigid as a tooth can be. Even if our preparation line passes through the dentin enamel junction margin and enters into dentin, minor invasions won’t create a major problem. However, if the finished preparation is in contact with large amounts of dentin, this will create complex bonding issues with the dentin and will also increase the flexing factor on the tooth structure. If a tooth, which has been aggressively prepared and is more flexible as a result, is subjected to different occlusal forces and keeps on flexing, the luting resin at the margin will start coming off slowly and this situation will result in micro leakage or even de-lamination.

Analysing The Smile

In order to understand and visualise the desired outcome clearly and to produce the final smile design, the existing smile should be analysed carefully, using a 3-dimensional view. We should follow a video and photo protocol (Fig. 1).

Facial View

When we analyse the smile using a facial view, we see the mesiodistal and vertical problems. We can also see the midline, the occlusal plane and the length and axes of the incisal teeth and can determine the desired future smile curve and the length of the future incisors (Fig. 2).

45-degree-angle view

This angle gives us the opportunity to check the buccal-lingual position of the teeth and their crowding. It also gives us an idea of how the lips are supported by the teeth (Fig. 3).

The View according to the Lip

This view can determine the buccal-lingual position of the teeth from a different angle (Fig. 4).

Digital Scan of the Upper and Lower Jaw

This gives us a chance to observe all aspects of the teeth in different angles from a 3-dimensional viewpoint (Fig. 5).

Treatment Planning with Digital Wax Mock-Up

The digital scan of the patient is opened in software that can produce a wax-up digitally. In order to enhance each patient’s facial features and create a pleasing restoration, harmony in the size, shape and arrangement of the teeth is required. The dentist designs the new wax-up digitally and can also use pre-existing tooth templates from the software; this helps to speed up the digital wax-up. (Fig. 6).

The finalised digital mock-up is printed as a 3-dimensional acrylic model (Fig. 7).

Aesthetic Communication with the Patient with the Acrylic Template

The dentist should be able to understand all the signals coming from the patient, whether verbal or non-verbal. Using all these signals, the dentist designs the digital wax-up, so that the design can be tried in the mouth. The silicone index, made from the digital wax-up model, is placed over the dental arch in order to allow the visualisation of the existing positions of those teeth on the dental arch, relative to the final outcome of the wax-up and veneers (Fig. 8). The lip support of those restorations and the aesthetic length can be easily evaluated and should be approved by the patient. Also, we want to evaluate the functional movements of the patient to see whether the design would create an anterior construction or not. The patient can easily look at the new smile design in the mouth and will be able to determine what he/she likes and dislikes. At this stage, minor changes can be made to the acrylic. If the patient wants longer teeth, free-hand composite can be added to the existing acrylic template to make the teeth longer. If the patient wants shorter teeth, the teeth can be shortened and arranged to the length the patient wants, using a composite shaping disc. In rare cases, we cannot satisfy the patient and we spend hours on the design. This is not because the dentist does not know his job, but because the patient does not know what he wants. The ability to say no to such patients will save the dentist many sleepless nights! If the aesthetic dentist and patient find it difficult to agree on the objectives, it is in the best interests of everyone not to begin the treatment. Since, by using this additive technique, you have not touched the sound tooth structure, you can easily consider not going on with the case. But, as I said, this kind of case is very rare. Most of the patients are very happy with the design in the mouth. Then, a suitable tooth shade is chosen and we go on to the next step.

Tooth Preparation Through the Acrylic

The beauty of these Aesthetic Acrylic teeth is that, besides the evaluation of the aesthetic functions and phasic aspects, we have a great tool in our hands now to prepare the teeth. Since this Acrylic resembles the exact final contours of the final outcome, such as the incisal-edge position and the facial contours of the teeth, now...
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we can start preparing the teeth using the Acrylic. We prepare our teeth using depth cutter burs and, according to the shade we have chosen, we determine the depth of our preparation and paint over the acrylic guide with a felt tip pen (Fig. 10a, Fig. 10b, Fig. 10c).

After that, the Acrylic guide is removed from the tooth surface and the areas that need to be prepared more are clearly seen because of the marked areas that we already painted (Fig. 11). The preparation depth is limited until we take off all of the remaining paint on the tooth. On some occasions, the tooth doesn’t have any depth is limited until we take off all of the margins and enable a healthy peri-odontal state.

The Lab Procedures

There are two fabrication options to carry on from here: the 'conventional way' or the 'digital way.' In the conventional way, two impressions are taken from the patient. One impression is of the tooth preparation and the other impression is of the impression of the acrylic template on the patient’s teeth. The technician can use this as a guide and build up his veneers using pressable ceramics with external staining or layering techniques.

In our case, we continued with the digital way and only used digital impression techniques from the start to the finalisation of the case. We took a digital impression of the tooth preparation (Fig. 15) and then we took a digital impression of the patient’s chosen acrylic smile design (Fig. 14). Then, using a digital copying technique, the veneers were designed digitally (Fig. 13). The veneers were then milled, externally stained and glazed (Fig. 16).

Try In

When the veneers are fabricated they should be first tried out in the mouth. The veneers should be tried out one by one in order to check the margins fit accurately, and then together, to see their overall integra-
tion with each other, with the lips and finally, with the face.

Bonding

I prefer a sectional rubber dam placed in the mouth, because it is much easier for the patient and the dentist to isolate the teeth. Once the teeth and the inside of the veneers are surface-treated, they can now be bonded. Preferably, the bonding should start with the centrals, proceeding with the lateral, canine on one side and the other lateral, canine on the other side. The soft tissues should be handled very gently. The easiest way to do that is to place the veneer on the tooth and, once it is completely seated, spot tack it from the middle with a 2mm tip. This will hold the veneer in place intact and then the tip of the light source can be switched to a larger diameter. Light cure the excess flash around the gingiva for only 1 or 2 seconds. This will not fully polymerise the luting resin but will bring it to a jelly consistency. That will be very easy cleaned with an explorer or a number 12 blade for the narrow areas. Then, go in between the veneers with a dental floss to cleanse the interproximal contacts. Then a full polymerisation is done, after applying a gel on the margins for the oxygen inhibition layer of the composite cement. Then, the margins should be finished with a rubber cup, but never with a diamond bur since this will totally ruin the glaze and the polish of the porcelain on the margins (Fig. 17). The final results of the cemented veneers are seen from different angles (Fig. 18a, Fig. 18b, Fig. 18c).

The techniques explained above will help to make communication between the patient and the lab more reliable and solid. It will be helpful in achieving the best aesthetic results with minimal tooth reduction. □
Interview: “Applying the 3D printing technologies of tomorrow to the supply chain problems of today”

Julian Callanan, Managing Director of Sinterex

By Dental Tribune MEA / CAPPmea

Sinterex is a manufacturing company which specializes in the mass production of customised products using 3D printing technology (Additive Manufacturing). Dental Tribune MEA had the opportunity to meet with Julian Callanan, founder of Sinterex, and ask more about the company.

Dental Tribune MEA/CAPPmea: What is the story behind the idea of Sinterex?

Julian Callanan: Sinterex was created out of a passion for metal 3D printing technology. Metal 3D printing has been the fastest growing subset of the 3D printing phenomenon for several years now. Nearly all new Airbus and Boeing planes contain metal 3D printed parts. Elon Musk’s SpaceX rocket even has a metal 3D printed engine combustion chamber. We were excited by the tremendous potential of this technology and wanted to build a company to channel this innovation in the Middle East.

Dental Tribune MEA/CAPPmea: What is the manufacturing process?

Metal 3D printing works through a process called Powder Bed Fusion. Powder Bed Fusion uses a fine layer of metal powder, in our case a CE-certified bio-compatible Chrome Cobalt, rolled onto a plate. A laser high-precision fibre laser is then used to selectively melt the metal powder to create the first layer of the desired shape. The accuracy of this laser is +/- 20 microns. To put this in context, a human red blood cell is about 5 microns, whilst a human hair is on average 75 microns wide.

After the layer has selectively melted the first layer, the plate drops, a new layer of powder is rolled, and the laser fires again. This process is repeated layer by layer, step by step, until the desired part is finished.

Dental Tribune MEA/CAPPmea: Why did you decide to do what you do in the UAE?

A number of factors meant that the UAE was a great home for Sinterex. Firstly, there are some fantastic clinics and dental laboratories here which are pushing further towards digital dentistry and embracing new production techniques. We felt that we could build good partnerships. Secondly, Dubai recently set out a strategic vision to create a 3D printing hub. We see ourselves as a supplier to these dental labs and our objective is to enable them to offer digital metal CAD/CAM solutions and to move away from time-consuming and potentially error-prone manual metal work.

Dental Tribune MEA/CAPPmea: What is your target market at the moment and what are your expansion plans?

For future expansion, we are listening carefully to our customers in the dental industry and having some great conversations about areas of further collaboration. At some stage in the future, we are also interested in stepping out into medical customised implant manufacturing. For now though, we remain focused on delivering great products and service to our existing customers and looking to add new customers.

Dental Tribune MEA/CAPPmea: How can the region benefit from this technology?

Both clinics and laboratories in the region can benefit significantly from this technology. For digitally-erased companies, those with 3D scanners and 3D design software, we offer localised production at very short lead-times and much smaller prices than milling centres in Europe. For those companies which have not yet digitalised, we can help them to gain the benefits of digital production - accuracy, speed, reliability - without having to carry the costs of purchasing production equipment.

Sinterex is dental laboratories in the Middle East region. We see ourselves as a supplier to those dental labs and our objective is to enable them to offer digital metal CAD/CAM solutions and to move away from time-consuming and potentially error-prone manual metal work.

Dental Tribune MEA/CAPPmea: How does your technology benefit patients?

Patients benefit from gaining access to a technology which provides quicker and more accurate results than traditional manual techniques.

For those patients who are interested in technology, they also benefit from being able to tell their friends that they have a 3D printed smile!

What is the future of 3D printing in dentistry?

3D printing and dentistry are a perfect fit for one another. 3D printing enables the mass production of customised parts with high degrees of accuracy. Dentistry requires small and accurate patient-specific solutions. Therefore, the two are very well aligned. As time goes on, we may see the 3D printing of models becoming obsolete as intra-oral scanning and digital design improve. However, 3D printing for patient applications is here to stay.

What is your target market at the moment and what are your expansion plans?

Our target market at the moment is dental laboratories in the Middle East region. We see ourselves as a supplier to these dental labs and our objective is to enable them to offer digital metal CAD/CAM solutions and to move away from time-consuming and potentially error-prone manual metal work.

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Interview: How chairside CAD/CAM (MyCrown) changed my everyday practice

By FONA

IDS 2017 is the biennial exhibition where dental companies get the chance to showcase their latest products and shape the next 2 years of dentistry. And this time, FONA came with the biggest news it has ever announced – a complete integrated chairside CAD/CAM system for dentists – MyCrown. We interviewed MDDr. Marek Šupler, MPH, one of the pioneers of MyCrown, on how he found using the system.

FONA: How long are you using MyCrown now for?
MDDr. Marek Šupler: I am using MyCrown since October 2016, for 6 months now.

How did you find the workflow? Was it easy to learn?
First, I made 2-3 cases on models, to get familiar with it – the software, how to scan. Then I used it for my first patient. It was my friend and it was a very easy case – just a filling. But it took me 3 hours! It was too long but it was the first time. I used half of the spray can, I wanted to scan every detail – which is why it was so long. The software was very intuitive from the beginning, I love the touch screen! In 5 steps you have a new crown. Even if you have a new crown, MyCrown.

The biggest challenge for you was if you scanned the treatment area well enough?
Yes, because the other things I had done before – cementation, preparation, isolation of the saliva. The scanning and software creation was the challenge. But it is normal as with any new technology.

How did you find the support you received from the FONA team?
Perfect. First, I had a training which lasted 2 days. I learned how the software works and how to scan first on a model and then on a patient. They answered every question I asked. I received continuous support. Then, 4-5 months later I received advanced training. It was on different materials I could use and glazing, staining the material and colour. After the milling, with some materials the crown is rough. Then you have to make it look natural.

How did MyCrown change your practice? When did you start to see the change?
From the very beginning. I used to think differently. Now I started to think strategically how to treat my patients better. This kind of restorations are usually created for endodontically treated teeth. Before MyCrown, I mostly did fillings – so direct restorations, and small overlays. Now my approach was changing. As a crown can protect an endodontically treated tooth better and would last longer, while still completed in one session, it is my first choice instead of a filling. I discuss this option with my patients and they are happy. For them, to get a traditionally made crown on endodontically treated tooth is more complicated. They have to come more times, which takes extra time for them and me, parking in Bratislava city center is terrible, so they are happy. Same as me. Additionally, often there is complexity working with the lab. MyCrown changed my dental practice completely.

Do you find that you can see more patients now?
Yes, definitely. People love new technologies and they talk to each other. They tell their friends and the word spreads quickly. Also, people tell me I am improving. One patient that I have since the beginning of my practice told me: “I can see you are improving, every next time I see you.”

Who would you recommend MyCrown to as a professional in the field?
I think every dentist should have it. Because it’s a perfect tool for me to improve myself. I can see my restoration, preparation 40 times more than before. My first scans were horrible and now I am improving in that area also. But not only from this side. It is also great for patients. Every dentist who cares about their patients should give MyCrown a try.
Preserve and protect gums and teeth for the long-term without compromising your patients’ oral health

Free of sulfate, alcohol, parabens, chlorhexidine, cetypyridinium chloride and triclosan, limiting the risk of uncomfortable sensations. Does not stain teeth. Preserves the oral flora for the long-term.

With fluoride
(toothpaste: 1450ppm, mouthrinse 248ppm).

Coenzyme Q10 and pomegranate contribute to the long-term protection of the gingival and dental tissues4-8.

INNOVATIVE ANTIPLAQUE SYSTEM
DISRUPTS THE BACTERIAL BIOFILM AND PREVENTS THE MICROORGANISMS TO READHERE TO ENAMEL1-3
Advanced Restorative Techniques
And The Full Mouth Reconstruction
- Full arch bridge design on implants
Part 9

In part nine, Paul Tipton looks at bridge design and describes a new technique for improving the aesthetics, maintenance and fit of the full arch porcelain-fused-to-metal implant retained restoration.

By Prof Paul Tipton, UK

Introduction
For many years the holy grail of implant prosthodontics has been a passive fit of the bridge framework onto titanium implants. The original ‘framework’ protocol (1981) relied heavily on this goal to ensure a long lasting restoration and longevity of the implants. Whilst a passive fit may have been achieved on many traditional acrylic on gold, screw-retained restorations, several further difficulties were encountered achieving the same passive fit with a porcelain-fused-to-metal bridge. Jemt (1996) stated that in fact none of the prostheses he tested presented a completely passive fit. His study indicated that a certain biologic tolerance for misfit may be present in most restorations and in conclusion that an absolute passive fit was impossible to attain for a traditional screw retained restoration.

Casting Techniques
Carr (1991) and Hsu (1993) have shown that full arch impression techniques using either pick up or transfer style impression copings are also inaccurate and many hours have been spent in sectioning framework from an inaccurate case, picking up these sections in the mouth prior to soldering in an attempt to achieve an adequately fitting framework. Shiffleger (1985) showed that large one-piece castings are not accurate and that these need to be sectioned and soldered for a more accurate casting and as soon as porcelain is added onto the framework, Bridger (1985) showed that the framework will distort leading to further inaccuracies in the fit. These inaccuracies tend to be larger, more posteriorly in the arch.

Cement Restoration
Misch (1995) suggested that a cement-retained implant supported...
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Module 1  |  05-07 October 2017  |  Prof. Paul Tipton
Treatment Planning in Advanced Restorative Dentistry | The Principles of Occlusion in Advanced Restorative Dentistry | Tooth Preparation in Advanced Restorative Dentistry

Module 2  |  22-25 November 2017  |  Prof. Paul Tipton
Master the Art of Composites Part 1 - Adhesion Composites & Anterior Composite Restorations | Master the Art of Composites Part 2 - Composite Veneers | Master the Art Composites Part 3 - Posterior Composites | Porcelain Inlays & Onlays

Module 3  |  14-17 February 2018  |  Prof. Paul Tipton & Prof. Goran Urde & Mr. Bill Sharpning

Module 4  |  09-12 May 2018  |  Prof. Paul Tipton & Prof. James Prichard & Dr. James Russell & Mr. Jonathan Parkinson
Enhance Your Expertise in Endo Part 1 & 2 | Minimally Invasive Veneer Preparations | Emax & Zirconia Anterior Restorations

Diploma  |  4 Modules  |  15 Days
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Module 5  |  September 2018  |  Prof. Paul Tipton
Occlusal Examination | Modern Ortho Combined | Digital Dentistry and Lab Flow

Module 6  |  November 2018  |  Prof. Paul Tipton & Prof. Crawford Bain
Articulator selection in Restorative Dentistry | Aesthetic Perio Connective Tissue Grafting | Modern Post and Core Techniques Aesthetic Perio Crown Lengthening

Module 7  |  February 2019  |  Prof. Paul Tipton & Prof. Edward Lynch
TMD, It's Diagnosis and Treatment | Veneer Cementation | Techniques Practical | Gold and Zirconia Posterior Crown and Partial Crown Prep Techniques | Minimally Invasive Dentistry

Module 8  |  May 2019  |  Prof. Paul Tipton

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prosthesis offers several advantages when compared to a screw retained, in that the super-structure may be more passively attached. A screw is a combination of inclined planes and wedges, and one of the most efficient machine designs. Much described that a torque force of twenty Newtons per centimeter squared applied to a screw when screwing down, a framework is sufficient to move two railway cars apart! The same forces on a non-passive casting has a tendency to distort the super-structure and the bone / or the implant. As a result, the fabrication of a passive final restoration is highly unlikely when the screw retention is the method of fixation.

Passive fit

The cement retained restoration may offer a better chance of a passive fit in some areas of the implant abutment crown interface, because of the distortion previously described during impression techniques, casting and then porcelain application, very often spaces need to be incorporated under the framework to achieve adequate fit leaving large cement spaces in the posterior areas of the bridge. Alternatively, by means of a fit checker, the internal aspects of the bridge can be adjusted to achieve optimum fit with the same result of open cement margins and loss of retention. In order to achieve retrievability of the restoration, the cemented prosthesis is usually cemented with a soft cement, but unfortunately one of the problems of the softer cement is that of cement washout. Patel (2000) has maintained that this can then lead to excess stress being placed on certain abutments and implants due to cement washout under the crowns on top of other abutments. Again, this leads to potential problems with over stressing of implants.

Aesthetics

A further problem that has been observed with the large porcelain-fused-to-metal full arch bridge, is that of less than ideal aesthetics. It is a daunting task for the technician to build a porcelain to restore the lost tissue spaces combined with the need to restore functioning prosthetic teeth at the same time (Figures 1 & 2). A technician only has a limited number of options available to him to build up this final fixed restoration prior to the porcelain becoming too transluscent and losing its natural colour. The final result is that the aesthetics may not be as good as possible with individual crowns in a full mouth reconstruction, because of these constraints.

Maintenance

Porcelain is a very brittle material and has the potential to fracture under parafunctional and / or impact loading. Although acrylic has been recommended by Chipper (1991) as the veneering material for a full arch bridge because of its dapple-y effect, this has been questioned by Davis (1988), as porcelain has been shown to be more beneficial under static loading. Changing from a screw retained design of restoration with acrylic to one with zirconia in the occlusal and palatal surfaces, to a cement retained restoration, will increase the strength of the final porcelain fused-to-metal bridge.

However, there is still the potential for fracture or cracking during long term function. Should this occur then it may be impossible to retrieve this from the mouth and repair the porcelain in the laboratory due to the contamination of the porcelain by saliva. This contamination makes the porcelain more liable to explode whilst in the furnace. Very often, re-shaping of the bridge or composite repair have been the only options to maintain the bridge long-term in function, with again loss of form, function and aesthetics. The alternative, which is both time-consuming and expensive, is stripping the porcelain and remaking it on the same framework.

This paper now describes a brand new technique for improving the aesthetics, maintenance and most importantly, the final porcelain fused-to-metal implant retained restoration using a pick-up coping technique over the custom made abutments.

Case Study

This male patient was referred to me from his general dental practitioner in Leeds for placement of implants and a fixed bridge in his lower jaw. The patient has most of his upper dentition and the referring practitioner had previously reconstructed this as a porcelain fused-to-metal restoration. The patient was anxious to have a similar style of restoration in the lower jaw to oppose his upper porcelain fused-to-metal bridge. It was the intention that the final restoration would have individual crowns cemented to a passive fitting pink porcelain fused-to-metal frame, cemented over eight custom made UCLA abutments.

Implants

Eight Branemark implants (Nobel-Biocare) were inserted into the lower jaw with a view to fabricating a fixed porcelain fused-to-metal bridge as the final reconstruction (Figures 3 & 4). Three months after placement of the implants and prior to uncovering a closed mouth impression was taken to allow the fabrication of a gothic arch trac-
Monolithic restoration: inside and out

Composite materials have undergone significant improvements to allow enhanced esthetic results in recent years. The advent of bulk-fill materials and universal adhesives has resulted in a streamlined application procedure.

By Dr Eduardo Mahn, Chile

Restoring teeth after endodontic root canal therapy has always presented a challenge. The wide range of materials available for post-endodontic treatment is paralleled by an equally wide range of selection criteria. Glass ionomer cements and composite resin materials are generally the materials of choice for clinical situations that need no endodontic posts. Sometimes amalgam is also employed because of longevity. When endodontic posts are required, the treatment options are available as the pulp chamber is filled with an adhesive, or an endodontic post or without. More remaining walls often diminish in thickness of up to 4mm. This means that technicians were for the first time able to create a monoblock, consisting of the core build-up material and the endodontic post. For this purpose, the core build-up material is required to feature a low flow consistency that is suitable for cementing the endodontic post. At the same time, the material should offer a sufficiently high level of strength and stability to be used as a core build-up. The second approach is to fill the tooth with a universal composite using a rather time-consuming layering technique either in conjunction with an endodontic post or without.

Most users prefer the first option because this approach affords a more efficient method than the second. It should be noted that the use of an endodontic post is in many cases often necessary. The indication for insertion of a root canal post is based on the extension of the contact surface. This is often the case in molars because of their large pulp chambers. Without a post, appropriate retention can often not be achieved in these teeth. The need for a post is often diminished in teeth with two or more remaining walls in particular.

Bulk-fill composites

What are known as bulk-fill composites were introduced a few years ago. Given the increased transluency of these materials, clinicians were for the first time able to place single increments in a thickness of up to 4mm. This means that most pulp chambers can be filled using one or at maximum two steps.

Hands-On Training in Dubai

Digital Smile Design Part 1 & 2

Tutor: Dr. Eduardo Mahn, Chile

Date: 01 & 02 May 2017  |  09:00 - 18:00

Accreditation: 14 CE Credits  |  HAAD 14 CME

Closing Diastemas and Correction of Peg Lateral

Tutor: Dr. Eduardo Mahn, Chile

Date: 03 May 2017  |  09:00 - 18:00

Accreditation: 7 CE Credits  |  HAAD 7 CME

Inlays, Onlays and Occlusal Veneers (Preparation and Cementation)

Tutor: Dr. Eduardo Mahn, Chile

Date: 04 May 2017  |  09:00 - 18:00

Accreditation: 7 CE Credits  |  HAAD 7 CME

Post-endodontic treatment: Should we place posts, do crowns or just composites and onlays?

Tutor: Dr. Eduardo Mahn, Chile

Date: 05 May 2017  |  09:00 - 18:00

Accreditation: 14 CE Credits  |  HAAD 14 CME

Non-Prep Veneers and Modified Non-Prep Veneers

Tutor: Dr. Eduardo Mahn, Chile

Date: 06 May 2017  |  09:00 - 18:00

Accreditation: 7 CE Credits  |  HAAD 7 CME

Direct Veneers: How to Create the Right Shape...

Tutor: Dr. Eduardo Mahn, Chile

Date: 08 May 2017  |  09:00 - 18:00

Accreditation: 7 CE Credits  |  HAAD 7.25 CME
Tetric EvoCeram® Bulk Fill is a posterior composite designed for the fabrication of direct restorations and is part of this new category of materials. The filler composition contains patented shrinkage stress relievers to reduce polymerization shrinkage and shrinkage stress. The composite is characterized by a filler content of 53 to 54 % (by volume) with particle sizes ranging from 40nm to 3,000nm. To accelerate the polymerization process, Tetric EvoCeram Bulk Fill contains the new patented initiator Ivocent® in addition to standard initiator systems (camphorquinone and Lucirin® TPO). As a result, 4mm increments, high esthetics and short curing times are no longer mutually exclusive. If a high-performance curing light (e.g. Bluephase® Style) is used, the bulk-fill composite can be cured in 10 seconds.

Combined with a universal adhesive

A new generation of universal adhesives have recently gained in popularity due to their flexible application possibilities, efficiency and ease of use. The new Adhese® Universal is a light-curing, universal single-component adhesive for direct and indirect restorations. Adhese Universal can be ideally combined with Tetric EvoCeram Bulk Fill. The universally applicable Adhese Universal establishes a strong bond to various types of restorative materials. The material’s low film thickness minimizes the risk of fitting inaccuracies after cementation. No dual-cure activator is required for the cementation of indirect restorations. Adhese Universal combines hydrophilic and hydrophobic properties. It is tolerant of moisture and penetrates open dentin tubules effectively. Since Adhese Universal is moderately acidic, it is compatible with all etching methods and ensures an optimum bond between the tooth structure and the restoration.

The simple “Click” activation of the VivaPen® delivery form allows the exact amount of material to be dispensed each time, eliminating the need for dispensing the material into a dish prior to applying it. As a result, considerably less material is wasted. The VivaPen contains 2ml of adhesive, which is sufficient for approx. 300 single-tooth applications. Compared to conventional bottle delivery forms, this amounts to almost three times more applications per millilitre (Source: Berndt & Partner, VivaPen Benchmarking Study, August 2013).

Clinical case

The following clinical case describes the use of Tetric EvoCeram Bulk Fill as a core build-up material in combination with Adhese Universal. The report outlines an efficient procedure for building up a tooth after endodontic treatment and restoring it with a monolithic crown (IPS Empress® CAD/CAM). Click to read the case study.

Conclusion

By using a modern bulk-fill composite in combination with a universal adhesive, endodontically treated teeth can be restored easily, effectively and reliably. Root canal posts are, in many cases, no longer required, for instance when restoring a molar with two or more residual cavity walls.

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Realizing efficient and predictable posterior quadrant restorations

Efficiency and long-lasting stability of the result are important requirements that are placed upon direct restorative procedures with composite. In this context, a system of well-coordinated materials is the definite key to success.

By Michael R. Sesemann, USA

It is not uncommon for middle-aged and older patients to present with multiple failing amalgam restorations in a single quadrant. Many such restorations can be replaced conservatively with direct composites. Unfortunately, however, many of the placement and accompanying adhesive protocols required for predictability can be time-consuming and technique sensitive. Therefore, it is important to understand the historical development of adhesive dentistry when considering today’s etching and adhesive protocol options.

In the beginning

Conceptualized more than 30 years ago, Buonocore proposed bonding to enamel and dentin by first treating those surfaces with phosphoric acid before applying resins. Although he considered resin tag formation in the micro-porosities of etched enamel to be principally responsible for adhesion to enamel, bonding to dentin was less predictable due to dentin’s composition, water content and smear layer. Not surprisingly, the first dental adhesives were resins that only bonded to enamel; there was little to no dentin bonding. On going changes in material composition, adhesive mechanism, application method and overall adhesive techniques fueled the evolution of adhesive dentistry and the introduction of increasingly esthetic restorative materials. They also led to different adhesive etching products and protocols.

“Total-etch” or “etch-and-rinse” technique

In “total-etch” or “etch-and-rinse” techniques, both enamel and dentin are etched with phosphoric acid to remove the smear layer and condition the preparation prior to bonding, with enamel being etched longer than dentin. The etchant and smear layer are then rinsed off with water and dried. Because dentin should remain moist and slightly glossy in appearance, care must be taken to not overdry the dentin. This prevents collagen fibers from collapsing, which would create a less permeable surface for hydrophilic monomers in the adhesive, as well as a weak interface, potentially leading to a poor bond and postoperative sensitivity. Although well-established and clinically proven, total-etch adhesives and their associated multistep techniques are often considered to be technique sensitive.

Selective-etch technique

With selective etching, only the etched enamel margins with less probability of postoperative sensitivity, since the dentinal tubules are not completely opened.

My preferred adhesive for such techniques is Adhese Universal, which is available in traditional bottle and unique VivaPen® delivery. For me, the ergonomic, pen-like VivaPen design and angled brush cannula enhance comfort, control and speed during direct intraoral application while reducing material waste. Containing 2 milliliters of adhesive, the VivaPen can accommodate approximately 150 single-tooth applications, which is almost 3 times the applications per milliliter compared to conventional bottle delivery. As a result, the Adhese Universal VivaPen cost per application is considered to be lower than that of all other leading universal adhesives.

Also contributing to more cost-effective and time efficient posterior restorations is the use of a bulk-filled composite (e.g. Tetric EvoCeram® Bulk Fill, Tetric EvoFlow® Bulk Fill). Because they can be placed in a single increment or layer of up to 4 mm, they are fully cured, they help eliminate time-consuming techniques.

Materials of choice

When replacing multiple failing amalgam restorations in a single quadrant using direct composite, I prefer using the selective-etch technique because it delivers the “best of both worlds”. It provides strong micro-mechanical retention at the enamel margin with less probability of postoperative sensitivity, since the dentinal tubules are not completely opened.

First, tooth 17 was restored. A segmented matrix set-up with two 37-32 YXR rings (Garrison Dental Solutions) and a 5.5-mm Slick Band was placed to facilitate predictable and ideal interproximal contacts. The preparation was selectively acid-etched with 37 % phosphoric acid for 20 seconds. After a universal adhesive (Adhese Universal) had been applied and light cured, a layer of Tetric EvoFlow Bulk Fill in shade IVW was placed, then light-cured for 40 seconds. The cured Tetric EvoFlow Bulk Fill layer exhibited dentin opacity (Fig. 3).

The restoration for tooth 17 was completed with a capping layer using Tetric EvoCeram Bulk Fill, which was smoothed with a modelling instrument designed for composite materials and light-cured for 20 seconds. Next, the restoration was contoured using a fine diamond and polished using discs and points. The cavity of tooth 14 was also conditioned with universal adhesive (Fig. 3). Then a single increment of Tetric EvoCeram Bulk Fill composite in shade A2A was placed into the cavity. The restoration was finished and polished using a silicone brush and diamond paste.
Clinical Endo Diploma Starting in Dubai with Fundamentals of Endodontics

By Dental Tribune MEA / CAPPmea

CAPP-Tipton Dental Academy and the British Academy of Restorative Dentistry (BARD) are launching the Clinical Endodontics Dentistry Certificate and Diploma programme in Dubai, UAE on 20 April 2017 with faculty lead Prof. James Prichard, UK. The organisers will welcome 24 delegates from Bahrain, Hong Kong, India, Iran, Iraq, Oman, Pakistan, Saudi Arabia, Qatar and UAE for the first module which will take place in the CAPP Training Institute between 20-23 April 2017. The four days will cover “Fundamentals of contemporary endodontics” which will include “Understanding of instrument design and its effect on prevention of iatrogenic errors” and a hands-on training on “hand filing and lateral compaction techniques.”

The programme prepares the delegates to treat complex and challenging cases such as retreatment which have higher failure rates when performed by dentists who have not received specialist training. The programme will employ several methods of delivering education.

The core of the course falls in to two areas of training: academic and hands-on training, skill enhancement with traditional and contemporary endodontic techniques. In the academic part, the education will be delivered via didactic lectures, seminars and student presentations.

The Certificate consists of three modules which will take place every three months. Each module is four days long. The course offers the participants a chance to obtain a Certificate in Clinical Endodontics from the British Academy of Restorative Dentistry (BARD). After a successful completion of the Certificate course, the participants will have the chance to sign up for the Diploma course which will lead to Post-Graduate Diploma in Clinical Endodontics from the British Academy of Restorative Dentistry (BARD). The Diploma consists of additional three modules which will take place every three months. Each module will be four days long.

After completion of the Diploma, there is an option for delegates to take the pathway to Masters in Clinical Dentistry (MClinDent) in Endodontology with City of London Dental School (CallD) and BPP University. Registration is now open for group 2 which will start later in 2017.

For more information about the programme visit: www.cappmea.com/endo

This is the second programme that CAPP-Tipton Dental Academy and the British Academy of Restorative Dentistry (BARD) have started in Dubai, UAE. There are two groups totaling 37 delegates already participating in the Restorative & Aesthetic Dentistry Diploma which started in 2016 and a third group starting in October 2017.

For more information about the programme visit: www.cappmea.com/capptipton
Implant Prosthodontics and Anterior/Posterior Diagnostic Waxing during Module 3 of the Restorative & Aesthetic Diploma

By Dental Tribune MEA / CAPPmea

CAPP Tipton Dental Academy and The British Academy of Restorative Dentistry (BARD) welcomed two groups of dentists from 18 different countries to Module 3 of the Restorative and Aesthetic Dentistry Certificate and Diploma programme between 10-15 February 2017 (Group 1) and 15-18 February 2017 (Group 2) in Dubai, UAE at the CAPP Training Institute.

The first two days of the module began with Implant Prosthodontics presented by Prof. Göran Urde from Malmö University in Sweden where he is also the Director at Future Clinic, Bridging Innovation & Research. The delegates placed implants on the Phantom Heads in the CAPP Training Institute during the hands-on training of the module. The third and fourth days comprised of lectures from Prof. Paul Tipton on The Art & Science of Smile Design and a hands-on training from Bill Sharpling from Kings College London Dental Institute on Anterior and Posterior Diagnostic Waxing.

The next modules are scheduled for May 2017. After Module 4, delegates will be graduating from Year 1 Certificate. Participants then have the opportunity to continue to Year 2 where they can obtain a Diploma in Restorative and Aesthetic Dentistry issued by BARD and also serving as a pathway to Masters in Clinical Dentistry (MClinDent) Restorative and Cosmetic Dentistry with City of London Dental School and BPP University or Master of Science (MSc) in Restorative and Aesthetic Dentistry with The University of Manchester and Healthcare Learning.

"Prof Tipton's lectures are wonderful, I enjoyed all of them and learned a lot. During the hands-on I enjoyed most waxing up veneers. Staff is welcoming and helpful."

"Prof. Urde is an amazing speaker with in depth knowledge who spends the time to answer every single question. The hands-on implant placement on the Phantom Heads was great..."
Minimally invasive inlay restoration from the hybrid ceramic VITA ENAMIC

By VITA

Inlay restorations using CEREC procedures have been an established process in digital dentistry for decades. However, due to the required minimum wall thickness, a lot of tooth substance frequently had to be dissected in reconstructions of traditional ceramics. Due to reduced minimum wall thicknesses, VITA ENAMIC (VITA Zahnfabrik, Bad Säckingen, Germany) allows minimally invasive restorations and can be precisely ground in thinly taping edge areas. In the report, Dr. Gerhard Werling (Bellheim, Germany) explains the clinical procedures for an inlay-restoration of hybrid ceramic in region 24-26.

Initial situation

Figures 1 and 2 show the initial situation. On the basis of the patient’s history and according to the patient’s request (male, 38 years), he was not treated with alternative methods (infiltration technique, fluoridation, regular controls, etc.). Instead, a filling cavity was carefully dissected on the tooth in which the cavity had already penetrated the approximal enamel in the X-ray image. Surprisingly, in the clinical image, the caries had penetrated deep into the dentine, so that after extensive excavation, a considerable defect in the substance was present.

Material selection

Since the patient wanted a permanent enamel-like and tooth-like restoration, composite could not be used as a restoration material. It was decided to proceed according to the “extension for prevention” rule - but as minimally invasive as possible. The hybrid ceramic VITA ENAMIC is very advantageous in this case. The unique network structure in which ceramic and acrylate polymers interpenetrate, provides for enormous resilience and offers more freedom than traditional restoration materials.

CAD/CAM workflow

Three VITA ENAMIC inlays were fabricated using the CEREC System (Sirona Dental, Bensheim, Germany). The intraoral scan was done using the CEREC Omnicam. With the biogeneric software, the reconstruction was done analogously to the missing chewing surfaces. In the grinding preview, the inlays were placed in the material blanks. The geometry EM-10 (8 x 10 x 15 mm) was chosen according to the shade determination with VITA Easyshade (VITA Zahnfabrik) in the color teo-S.T. The hybrid ceramic can be processed very simply and quickly by machine as well as manually. Thanks to the high load-bearing capacity and edge stability, constructions with comparably small wall thicknesses and thin running edges are also feasible. Edge chipping, which can occur in traditional ceramics, are rare with this material.

Processing and integration

It is advantageous that there is no firing process, and a shade characterization is possible if desired. The available shade selection (EM-1 to EM-4) in two translucent steps, plus the good light transmission of the material allow for esthetically pleasing results. The inlays have been polished to a high gloss with the VITA ENAMIC Polishing Set in the clinic. The hybrid ceramic can also be easily polished intraorally. With VITA polishing instruments, the restoration edges can be polished in a unique, fine manner so that virtually no transition between the tooth and the restoration remains visible. Bonding is performed adhesively.

VITA® and other VITA products mentioned are registered trademarks of VITA Zahnfabrik H. Rauter GmbH & Co. KG, Bad Säckingen, Germany.

Dr. Gerhard Werling, Dentist, Bellheim, DE

King's College London ranked top university in Europe for dentistry

By King's College London

The 2017 QS World University Rankings by subject have scored Dentistry at King’s College London first in Europe, and number 4 in the world for the second year running.

The QS rankings highlight the world’s top universities across 42 popular subject areas. Institutions are assessed on academic reputation, citations to publications and employer reputation to give an overall score. Executive Dean Professor Mark Woolford said: ‘Rising to first in Europe in the global rankings reaffirms our position as a world-class institution and reflects the dedication, commitment and innovation of our academic and professional staff, our students, and our alumni.’

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King’s College London

Dental Institute

London SE1 9RT

United Kingdom

W: www.kcl.ac.uk/dentistry
Ivoclar Vivadent launches comprehensive CAD/CAM product portfolio under new brand

By DTI

COLOGNE, Germany: Increasing digitalisation of the dental treatment workflow requires all the different components used in a process to be optimally coordinated. To meet this demand, Ivoclar Vivadent has extended its long-standing materials and processing expertise to the entire digital process chain with a comprehensive portfolio of CAD/CAM products for both dental laboratories and practices. The new range, under the brand Ivoclar Digital, is being presented for the first time at IDS 2017, the company announced during a press conference in Cologne in Germany today.

Increasing the reliability and efficiency of fully digitally produced restorations quickly and easily with four new PrograMill digital milling units that are suited for laboratories of all sizes. The range of high-end scanners from 3Shape has also been extended to include the new 3Shape E series, which, together with the Dental Designer software and exclusively developed Ivoclar Digital software add-ons, is aimed at increasing the reliability and efficiency of fully digitally produced restorations.

For Ivoclar Digital, new products have been added to the company’s range of aesthetic, state-of-the-art CAD/CAM materials for fixed, removable and implant-supported prosthetic restorations, including versatile ZirCAD blocks and a range of discs for the IPS e.max system.

Dentists and laboratories will be able to digitally produce dental restorations quickly and easily with four new PrograMill digital milling units that are suited for laboratories of all sizes. The range of high-end scanners from 3Shape has also been extended to include the new 3Shape E series, which, together with the Dental Designer software and exclusively developed Ivoclar Digital software add-ons, is aimed at increasing the reliability and efficiency of fully digitally produced restorations.

As an IDS tradition, DTI hosts an event every evening under a new theme. Throughout the dental industry, these invitation-only nights are known as an exclusive opportunity to receive business updates on international markets and connect with leaders from the dental industry.

The media lounge was hosted by the company Kulzer. The second evening was Russian Night, Kulzer’s career club for dentists and dentists aiming to open their first dental practice. Every evening, traditional cuisine and beverages relevant to the respective theme were served.

The Dental Tribune Middle East & Africa Edition  |  3/2017

Who’s who of the dental industry gather at DTI Media Lounge

By DTI

COLOGNE, Germany: The 2017 International Dental Show (IDS), which took place from 21 to 25 March, was a show of superlatives in many respects. One of the numerous highlights on the exhibition floor this year was the Media Lounge, the booth of Dental Tribune International (DTI) and its German publishing partner OEMUS MEDIA. It gave representatives of the global dental business a 290 m² space in which to relax and network.

With a unique design that changes every two years, the Media Lounge provides an oasis during the busy IDS week. Accessible via a personalised invitation card, which members of the dental industry receive ahead of the show, the Media Lounge offers delicious à la carte dishes, as well as coffee and other drinks, prepared by a high-end culinary crew.

As an IDS tradition, DTI hosts an event every evening under a new theme. Throughout the dental industry, these invitation-only nights are known as an exclusive opportunity to receive business updates on international markets and connect with leaders from the dental industry.

On 23 March, Russian Night was organised in collaboration with DTI’s media partner DENTALEXPO. The second evening was Brazilian Night, the third Channel 3 Night and the fourth Russian Night, which took place from 22 to 24 March, was organised in close collaboration with DTI’s local partner in Iran. On the evening of 25 March, dental company Kulzer hosted an information session for dental students about dentXperts, Kulzer’s career club for dental students, young assistant dentists and dentists aiming to open their first dental practice. Every evening, traditional cuisine and beverages relevant to the respective theme were served.

The Media Lounge featured a fully equipped editorial office, where editors, graphic designers and video specialists produced up-to-the-minute content during the show. The result was six daily issues of the today trade show newspaper, which published product news, interviews and other highlights of the previous day. More than 30 hostesses distributed 10,000 issues daily to the around 155,000 visitors to the show.

In addition, the online editorial team informed e-mail subscribers about the latest at IDS through newsletters sent throughout the day. For the first time in the history of its participation at IDS, DTI hosted a lecture space. From 22 to 24 March, visitors had the opportunity to attend 30-minute presentations by dentists, product developers, dental experts and other representatives of the global dental industry. The interactive lectures took place every hour and were broadcast live online.

Go to Topics to read more news from IDS
Latest CAD/CAM materials less likely to be stained by coffee than conventional resins

By DTI

BANGKOK, Thailand/TOKYO, Japan: With the development of new materials and technology in dentistry, expectations for durable and aesthetically pleasing restorations are ever increasing. In a recent study, researchers from Thailand and Japan investigated how sensitive various restorative materials were to discoloration from coffee.

Leaving a lasting impression may be desirable in a job interview, but is certainly not what one wants from one’s morning coffee. Just like natural teeth, restorative materials are susceptible to discoloration from certain foods and beverages with high staining properties, including coffee, tea and red wine. In order to avoid discoloration over time, surface quality is thus essential for the success of restorative treatments.

New CAD/CAM composite resin blocks are industrially polymerised under standardised parameters at high temperature and pressure to achieve optimum properties at the macrostructural level and a high degree of conversion. As a result, material characteristics have improved compared with direct restorative composite resin.

In the study, researchers from the Tokyo Medical and Dental University in Japan and the Chulalongkorn University in Bangkok aimed to evaluate how modern composite resin block materials developed for CAD/CAM systems react to coffee exposure compared with conventional resin materials.

The researchers measured the change in colour in eight CAD/CAM blocks, including five composite resin blocks (Block HC, Shofu; CER- A SMART, GC; GRADIA Block, GC; KZR-CAD Hybrid Resin Black, Yama- moto; Precision Metal, Lava Ultimate, 3M ESPE), one hybrid ceramic block (VITA ENAMIC VITA, Zhafnabrik), one PMMA block (Tello CAD, Ivoclar Vin- vident) and one feldspathic ceramic block (VITABLOCK Mark II, VITA Zahn- fabrik), and four conventional composite resin blocks. The latter included one hybrid composite (CLEARFIL AP-X, Kuraray), one macro-filled composite (Durafill V5, Kulzer) and two nano-hybrid composites (ESTELITE SIGMA PRECIOUS Metal; Lava Ultimate, 3M Espe).

They created 10 mm discs from each of the restorative materials and then calculated the discs’ initial colour measurements before placing them in an instant coffee solution, which was changed daily. Colour changes were measured after one day, one week and one month.

The results showed that the coffee solution significantly discoloured all of the discs over time; however, CAD/CAM materials were generally less affected than the conventional resin materials. After one month, the change in colour of CAD/CAM composite resin blocks and restorative composites ranged from 1.6 to 3.7 and from 21 to 7.9, respectively. According to the researchers, only one material, Durafill V5, was not significantly more discoloured after one month than after one day.

However, in testing whether the coffee solution was restored after polishing with prophylastics paste for 20 seconds. Of the conventional composite resins, Durafill and Filtek Supreme Ultra still showed some noticeable discoloration after polishing.

The authors noted that, owing to the study’s in vitro design, it is unknown how external factors, including regular tooth brushing, might affect the long-term discoloration of the materials when used in patients. They further pointed out that one month of immersion might have exaggerated the results beyond what would be seen in vivo, as immersing materials in coffee for one week is the equivalent of about seven months of coffee drinking.

The study, titled “Discoloration of various CAD/CAM blocks after immersion in coffee,” was published in the February issue of the Restorative Dentistry and Endodontics journal.

Coffee is one of the world’s most popular beverages. However, it is known for its tooth staining properties. A study has now tested how various CAD/CAM materials reacted to immersion in coffee. (Photograph: Pexels/PixaBay)
IDS 2017 sets new record

By DTI

COLOGNE, Germany: More than 155,000 people from 157 countries visited the International Dental Show (IDS) this year, according to the latest figures released by organiser KoelnMesse. This is an increase of 12 per cent compared with IDS 2015. Furthermore, the number of international attendees rose by almost 20 per cent to around 60 per cent. There was also a slight increase in national visitors.

There was a significant increase in visitor numbers from almost all regions: the Americas (+52.9 per cent), eastern Europe (+43.0 per cent), the Middle East (+31.7 per cent) and Asia (+28.0 per cent). The number of attendees from Germany (+23.5 per cent, compared with 39, respectively, in 2015), as well as 1,617 exhibitors and 44 additionally represented companies from abroad (1,406 and 44, respectively, in 2015). The proportion of foreign companies was 72 per cent (compared with 51 per cent in 2015) came from abroad. Of the more than 155,000 visitors from 157 countries (187,500 visitors from 152 countries in 2015), around 60 per cent (compared with 51 per cent in 2015) came from abroad. IDS 2017 focused on digital production and diagnostics, intelligent networking solutions for practices and laboratories, smart services for dentists and dental technicians, as well as the further improvement of patient care and thus oral health worldwide.

The next IDS will take place from 12 to 16 March 2019.

Interview: “Our new products are game-changing”

By Yvonne Bachmann, DTI

On Monday night, global leader in dental manufacturing Planmeca welcomed around 700 international distributors to its Dealer Event at the Musical Dome in Cologne in Germany. In a groundbreaking and visually impressive show, participants were introduced to the company’s latest inventions, including a new CBCT unit, a lightweight oral scanner, a milling unit, state-of-the-art software and an operating light. At the event, Dental Tribune Online had the opportunity to speak to Planmeca Group Senior Vice President Tuomas Lokki about the game-changing products and the Dream Clinic Show, which the company is presenting at its booth during the International Dental Show (IDS) this week.

Dental Tribune Online:

Mr Lokki, Planmeca has developed a large number of new products that are all being launched during IDS. Which of them are especially noteworthy?

Tuomas Lokki: That is difficult, but if I had to pick three, it would be Planmeca Viso, the next-generation CBCT unit, which is capable of capturing outstanding images at a low radiation dose even during longer working days and introduces a renewed imaging workflow; Planmeca Emerald, a new iTi g intra-oral scanner that is small, lightweight and exceedingly fast with superior accuracy; and the entire Planmeca Romexis software suite. What makes these products special is that we can now provide a full clinical digital workflow, and that is important. There are many modules and there have been different software programs, but now this has all been combined into one program and a comprehensive workflow. We think that our new products are game-changing because the ultimate goal is efficiency in the dental clinic, and if we can help clinicians improve their workflow, I think they will trust us.

Planmeca equipment and takes us through a case in which it is all applied. It features everything the clinician needs to have and know. The show is being presented in a closed environment, so it can be enjoyed without interruption. In between those sessions, we are introducing Planmeca Viso and informing visitors about this 3-D imaging platform of the future.

The Planmeca Group employs 2,800 people worldwide. How many of them were involved in the development of the new products being showcased this week in Cologne?

We work with dentists and we have 200 engineers involved in the development, but, naturally, this is a team effort. Everybody in the company contributed. We start preparing for IDS when the last one has ended—after IDS is before IDS. However, the last six months have been particularly busy. About 250 people from various divisions are now here at the trade show to present the company and its portfolio.

Thank you very much for the interview.
Study finds Zendium toothpaste to promote healthy balance of mouth bacteria

By DTI

SAN FRANCISCO, USA: Good oral health depends to a large extent on the balance between health-associated and disease-associated bacteria in the mouth. New research, presented at the General Session and Exhibition of the International Association for Dental Research in San Francisco in March, has proven that Zendium, a Unilever toothpaste brand available in most of Europe and the Middle East, promotes such a balanced oral microbiome as the first of its kind.

According to the study, which was published in the Scientific Reports journal earlier this year, the enzyme- and protein-containing toothpaste significantly increased health-associated bacteria and reduced disease-associated bacteria in the oral plaque microbiome in subjects brushing with Zendium over a period of 14 weeks. As a result, a microbial community with a stronger association with health was formed, compared with baseline, the researchers said in their report.

It is the first time that a toothpaste has been shown to significantly shift the oral microbiome at species level, according to Unilever. For their study, the researchers used the Human Oral Microbiome Database and next-generation DNA sequencing techniques in order to characterise the oral plaque microbiome.

The research was also conducted in cooperation with internationally leading genomic research centres.

“The mouth houses the second-most diverse microbiome in the body, and now advanced molecular techniques have enabled us to better understand how it is possible to promote a balanced microbiome,” commented Dr Alison Green, Director of Oral Care Research at Unilever, on the results.

Available on the market since the 1970s, Zendium has a formulation that boasts a number of natural enzymes and proteins that are similar to those found in saliva, where they are known to promote a healthy microbiome.

The study, titled “A randomised clinical study to determine the effect of a toothpaste containing enzymes and proteins on plaque oral microbiome ecology”, was published online on 27 February in Scientific Reports.
Eleven tips for success in your dental clinic

Part IV: ROI and PEST

By Dr Anna Maria Yiannikos, Germany & Cyprus

Welcome to the fourth part of the series Eleven tips for success in your dental clinic. Our new tips are about knowing how to choose the right investment for your clinic in order to have the greatest possible ROI.

Now what is ROI? ROI stands for the acronym Return on Investment. Let’s explain the term a little bit further. It shows our clinic’s ability to use its assets to generate profits. How many of you have bought a new equipment bursting with excitement and six months later, had completely forgotten about it and never used it? How many of you bought an intra-oral camera and are still using it?

We are responsible to choose the investment with the highest ROI and we can do it by asking our patients for their needs based on an efficient protocol, for example by asking them questions such as: What are the most important treatments for you? Are you getting what you are expecting from us? What new treatments and trends are you interested in?

Never ever buy a new piece of technology because your friend/competitor/colleague has done it! Why? Because he does not have your patients. Please always remember this! It is very important!

Furthermore, you can assess your patients by yourself! What is your main target group? To which society groups do they belong? Are they afraid of the dental procedures or are they comfortable with them? Do you have a lot of patients and need to make more fillings in less time?

Know thyself and thy clinic

You can achieve this by learning in which areas we should improve ourselves (clinic) and in which areas we are in advantage. We can do that by using a very essential tool every six or twelve months, the so-called SWOT analysis. This is composed of four elements: our strengths, weaknesses, opportunities and threats as dentists. And we have already talked about it in the first part of this series (please see laser 9/2015).

Analyse your environment

The third component of the protocol that I would love to share with you is PEST analysis. PEST stands for political, economic, social and technological environment. By knowing potential problems in advance, you will be more prepared and capable of finding the correct solutions. By making effective use of PEST analysis, you ensure that what you are doing is positively aligned with the forces of change that are affecting our world. By taking advantage of change, you are much more likely to be successful than if your activities oppose it.

By choosing a laser treatment instead of buying a new piece of laser equipment at my clinic. This shows our clinic’s ability to use its assets to generate profits. How many of you bought an investment for your clinic in order to have the greatest possible ROI?

The above protocol is one of the tools that you can be taught by the DBA educational programme full courses and seminars, including how to design your own ELT. In the next issue, we will reveal two brand new tips and practical solutions that will help you access new opportunities and potentials of your dental clinic and change the way you see and make business in dentistry. Until then, please remember that not only are you the dentist in your clinic, but you are also its manager and leader. You can always send me your questions and request for more information and guidance at dba@yiannikosdental.com or via our Facebook account.

Looking forward to our next trip of business growth and educational development!
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References:

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Root canal treatments overhauled through new device to detect untreated bacteria

By King’s College London

A new method of detecting bacteria during root canal treatments could eradicate the need for follow up appointments and prevent treatments from failing, according to a study published today in the Journal of Dental Research. The SafeRoot device, created by a team of researchers at King’s College London, enables rapid bacterial detection inside the root canal, ensuring the procedure has been successful and reducing the need for tooth extraction or surgical intervention.

Root canal treatments remove bacterial infections from the root canal space, while retaining as much of the natural tooth as possible. Around a quarter fail over time due to secondary infections, and most procedures require one or two visits to the dentist.

The first appointment is used to remove infected material in the tooth, and to administer an antibacterial treatment. During the second appointment, dentists visually assess the canal to check if the infection has been removed, but this process cannot guarantee that treatment has been successful. Each visit involves drilling and the removal of part of the tooth.

The SafeRoot device was created to detect any existing bacteria once the root canal treatment has been completed, with the aim of eliminating persistent or secondary infections and reducing the need for further treatments. Through fluorescent dyes and fluorescence microscopy/spectroscopy, SafeRoot can optically detect minute amounts of residual bacteria in the root canal space. Indeed, during trials the team were able to successfully detect bacterial cells after just three minutes of testing.

Using conventional sterile endodontic paper points which are routinely used in root canal treatments, the process is performed during the treatment, preventing any impact on clinical treatment time and minimising additional clinical steps.

"The resilient nature of bacteria, combined with often complex root canal structures, make disinfection challenging, leading to a considerable number of persistent infections. This is one of the main causes of root canal treatment failures," explained Professor Francesco Mannocci, Professor of Endodontics from the Dental Institute at King’s College London.

"SafeRoot will reduce the time for root canal completion and will increase the success rate of treatments by letting the dentist know when it’s safe to proceed with filling the tooth. This should produce fewer acute ‘flare-ups’ and failed root treatments, as any residual infection in the root canal will be identified," said Professor Tim Watson from the Dental Institute.

One million root canal treatments are conducted under the National Health Service each year, costing the General Dental Service £50.5 million.

"The treatments are not only time consuming and painful for the patients, but cost the NHS a significant amount. If we can reduce the number of root canal treatments and re-treatments required, it could mean sizeable savings to the NHS," added lead researcher, Dr Frederic Festy from the Dental Institute at King’s College London.

"SafeRoot could be applied to a wide range of biological infections as well, ranging from wound or respiratory, to dental infections. This is the first step in a new era of treatment for root canal infections. Future iterations of SafeRoot may be able to detect any microorganism with an anti-bacterial effect," added Dr Festy.

The treatments are not only time consuming and painful for the patients, but cost the NHS a significant amount. If we can reduce the number of root canal treatments and re-treatments required, it could mean sizeable savings to the NHS.
to implant related infections and contaminations.” Funding for this project was received from the EPSRC, CRIS PhD studentship and the Guy’s and St Thomas’ NHS Foundation Trust.

Notes
The SafeRoot project was chosen by the Design Council to participate in their 2016 Spark Programme, a funding and support programme designed to help entrepreneurs turn their bright ideas into commercially successful products. Over the course of 16 weeks, the research group were provided with specialist expertise and one-to-one mentoring. The SafeRoot project has been a collaboration between the Biophotonics Research group in the Dental Institute and clinical specialist endodontists in Guy’s and St Thomas’. Dr Fredric Festy, Senior Lecturer in Biophotonics; Prof Francesco Mannocci, Professor of Endodontology; Dr Neveen Hosney: Research Associate; Dylan Herzog, PhD student; Prof. Tim Watson: Professor of Biomaterials & Restorative Dentistry; Dr Federico Foschi, Consultant Endodontist; Dr Garrt Koller: Research Associate; Dr Richard Cook, Reader in Oral Medicine.

Papers mentioned in this news article

Rediscovering operative dentistry
By Awa Alani, UK

The first thing to come to mind when dentistry is mentioned is the delivery of fillings or the need for crowns, the management of the bite or the improvement of colour or shape of teeth. This is our core business and is the basis upon which the public is likely to measure the skill of the clinician. Indeed, many a dentist may cover behind the X-ray machine if asked to show them a patient complaining in the waiting room that “the filling fell out an hour later” nothing humble us more than this sort of dissatisfaction.

Operative dentistry appears to be a lost art among a contract that does not reward and more lucrative cosmetic sidelines of dentistry. Indeed, fillings or crowns or methods of achieving maximal benefit from minimal intervention are not marketed as “sexy” in the same way Botox or aligners are. Despite what the dental spindoctors want one to believe, restoring teeth optimally and properly will forever remain our utmost and required skill set. Conserving tooth tissue and protecting the patient from a tooth tissue after root canal treatment is a remarkable where implants are less successful than we thought and veneers are more invasive than we would ideally like to provide. Selling health as opposed to selling a product is the successful business model shared across all professions. Indeed, the value of health is priceless for a patient. The maximally invasive movement is often more acute and life threatening situations than dentistry ever was and could be in the future. How many of us would truly prefer open heart surgery through the slow splitting expansion of a rib cage, like a cooking oyster, as opposed to a stent fed through the femoral vein with the wound the size of a plaster? Dentistry and operative dentistry serves because there are those among us who prefer to let our technical (or more talented) colleagues do the creative work while they vaporise teeth to oblivion.

Like many paradoxical things in life, ignorance is bliss. Ask yourselves what your patients would choose if they understood the difference between conserving tooth tissue and conserving it and the associated biological costs. They would gladly pay more for a procedure that will guarantee less pain and likely prolong the longevity of the tooth as opposed to the restoration. We have to be wary of the root canal treatment crisis at the current time. Secondary care units are oversubscribed with the aim of providing physical and written information entirely with the aim of providing physical and written information. Care units are oversubscribed with the aim of providing physical and written information. For many, the value of health is priceless and requires skill set. Continuing Education should be the best place in the world to Rediscover and Innovate. By investing £60 million a year in research and postgraduate training, we are building the knowledge and skills base needed to address the scientific and technological challenges facing the nation. Our portfolio covers a vast range of fields from healthcare technologies, to manufacturing to mathematics, advanced materials to chemistry.

As the main funding agency for engineering and physical sciences research, our vision is for the UK to be the best place in the world to Rediscover and Innovate. By investing £60 million a year in research and postgraduate training, we are building the knowledge and skills base needed to address the scientific and technological challenges facing the nation. Our portfolio covers a vast range of fields from healthcare technologies, to manufacturing to mathematics, advanced materials to chemistry.

By Awa Alani, UK

"Ask yourselves what your patients would choose if they understood the difference between destroying tooth tissue and conserving it and the associated biological costs.”
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Making endo work in practice: is it worth it?

By Dr. Bob Philpott, UK

When we look at our outcomes in endodontics, ‘is it actually worth it?’ is a question I often ask myself. Having worked in NHS, private, general and specialist endodontics both in the UK and abroad, I understand the stresses and strains on practitioners and my aim is to try and apply some of this knowledge in order to come up with solutions for dentists to see how we can improve efficiency during endodontic treatment.

Endodontic ‘four-handed dentistry’ requires reassurance and efficiency

With patient expectations set pretty low, endodontics is a rarely appreciated discipline. There’s no doubt that root canal treatment is a ‘hard sell’ and we have to make the experience for patients as pleasant as possible. Involving your team to help reassure patients helps to reduce stress, improve efficiency and deliver better outcomes. Ensure your set up is simple, maximise your kit and have your nurse working closely with you. Think of endodontics as ‘four-handed dentistry’, especially when working under magnification; without your nurse on board you’ll struggle to do a good job.

Ethically bound to our patients – know your ability and limitations

If endodontics is the best treatment option, we are duty-bound to carry out that treatment for our patients, maximising productivity in practice in order to get the best possible outcomes. A good starting point to achieve this is knowing your own ability and limitations – only take on cases that you can comfortably treat and refer cases that you can’t. For accurate diagnosis you will not only need reliable eyes, a peri- probe and pulp tester, but also good light, magnification and a DG16 endodontic probe to locate canal orifices.

Creating an adequate glide path

Clamp the tooth and quickly apply the rubber dam. This offers several advantages, including keeping the area free from bacteria and saliva, improving visibility and stopping the patient’s cheeks encroaching upon the tooth and providing a fast and efficient sealing procedure. In practice, the tooth is, how much dentine remains, and importantly, what the patient’s occlusion looks like are all important considerations.

I usually find it’s better to prepare the post base at the obturation stage, because you’re more familiar with the actual root canal system. For me personally, fibre post systems perform very well as opposed to metal posts and cores. They preserve the aesthetics of the tooth and provide a fast and efficient sealing procedure. In practice I only use Radix fibre posts (Dentsply Sirona). I love their simplicity, the taper of the posts and the fact that they tend to fit the vast majority of root canals very well.

To help ensure successful clinical outcomes and patient satisfaction I look for comprehensive restorative solutions, which is why I use Core X-flow (Dentsply Sirona), consisting of a base and catalyst, which when mixed forms a dual-cured, highly filled composite resin core build-up and post cementation material, which is very easy to apply. Using ceramics on top gets a good, easily polished aesthetic restoration. I could not practice without a sectional matrix system for placement of restorations in the posterior region and I also like to use E-ครัว (Dentsply Sirona) bulk fill as a base in class I and II restorations.

What I love about modern endodontic systems is their simplicity and ease of use, making straightforward endodontic treatment a real option for the majority of general dentists. By knowing your limitations and only treating the cases you can do efficiently, you can adhere to biologi- cal principles and most importantly, you can get the best technical and healing outcomes for your patients.

Rotary or reciprocation?

For me reciprocation is the way forward. Look at Waveone Gold (Dentsply Sirona) – one of the best improvements in endodontic file systems I’ve ever seen. Reciprocation also helps to reduce costs as the majority of cases can be completed using just one single primary file. For the correct obturation strategy you will need gutta percha, the gold standard for filling the canal, with hand clinical evidence behind its suc- cess.

Think about the patient

The restorative phase of endodontics has a big effect on the final outcome and no root canal treatment is complete until the restoration is placed. Indirect composite restorations may offer a secure outcome, in which it’s easier to control the margins and contacts, but one question remains: do we want to leave the tooth uncovered? You must think about the patient; the particular case will determine whether you use composite or amalgam, how badly broken down the tooth is, how much dentine remains, and importantly, what the patient’s occlusion looks like are all important considerations.

I prefer to use Start X Tips (Dentsply Sirona), as they offer a wide range of options and are much less likely to break than diamond-coated tips. You need to be efficient in the use of instrumentation and understand how your endodontic tools work to avoid instrument fracture. nickel titanium files offer huge advantages over stainless steel hand files, as the taper enables removal of coronal interferences. They’re also more resistant to cyclic fatigue and allow you to work in a safe, more professional and effective way.

The same winning technique with greater flexibility

The restorative phase of endodontics is often overlooked and as such can significantly affect the final outcome. The ‘four-handed’ team can add an extra dimension to the procedure, allowing the clinician to focus on the root canal treatment while the nurse prepares the set up and the patient is kept comfortable.

Creating an adequate glide path

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Team players: function and esthetics
A systematic approach to full-mouth rehabilitation with all-ceramics

IPS e.max Smile Award 2016: The following article describes the complex full-mouth rehabilitation of a female patient who consulted our practice because she was dissatisfied with the appearance of her smile. A reliable and efficient approach made the most of the interplay of esthetics and function and all-ceramic materials.

By Anna Giorgadze and Ilias Psarris, DT, Greece

Esthetics and function – these two requirements are inseparable in restorative dentistry. The case outlined in this article highlights just how tightly these two aspects are connected. The patient primarily wanted the treatment to enhance her appearance. The dental team, however, could not fulfill these esthetic demands without taking into account the functional considerations. Their aim from the time of the treatment planning stage was to achieve a harmonious result. The extensive prosthetic work required a systematic treatment approach.

Case presentation
The young female patient consulted our dental practice about a smile enhancement. Her upper and lower anterior teeth were severely abraded and stained (Fig. 1). Moreover, she had received inadequate restorations in the past. The metal-reinforced bridges in the posterior region did not provide suitable function and esthetics. The patient was dissatisfied with the entire situation (Fig. 2). The unesthetic appearance of her teeth was an embarrassment to her, especially when she smiled.

Diagnosis and planning

The first general diagnosis was based on the needs of the patient. Furthermore, specific aspects of the situation were assessed. A corresponding diagnosis was made and the patient was presented with a preliminary treatment plan. In accordance with our protocol, the plan focused on attaining a satisfactory balance between the functional and esthetic requirements. Furthermore, mainly additive measures were planned, which would make the treatment minimally invasive.

The clinical diagnosis revealed the extent of the damage. Severe abrasion had considerably shortened the front teeth, which showed well-defined wear facets. The vertical dimension of occlusion was clearly too low. The patient’s smile line was not ideal and therefore, it negatively impacted her expression. The patient was in good general health. She did not complain of any temporomandibular joint pain or of tight jaw muscles. In the development of the final treatment plan, we first concentrated on the functional requirements. In the process, we established that the vertical dimension of occlusion needed to be raised by one millimetre and a new occlusal scheme created. Therefore, we proposed the following steps: stabilize the situation with the help of long-term temporaries before starting the prosthetic treatment; place two implants to close the gaps left by the loss of tooth 46 and 36; restore the dentition with all-ceramic crowns, bridges and veneers (IPS e.max Press, Ivoclar Vivadent) and provide the patient with a bite guard to protect the teeth after the treatment. The patient agreed to this plan.

Prosthetic pretreatment

Portrait pictures and video clips showing the patient when she is speaking and smiling constituted important diagnostic tools in the treatment process. They provided us with valuable information for the design of the diagnostic wax-up. Impressions were taken for the fabrication of the models. A facebow record was taken for the skull-related transfer of the situation into the articul-
From wax-up to mock-up

The models were articulated and a diagnostic wax-up (Figs 3 to 5) was created. The teeth were built up according to the new vertical dimension of occlusion. The anterior teeth were designed in such a way that the functional requirements of both function and esthetics were considered. The premolars and molars for receiving the prosthetic restorations were prepared. The occlusion was checked in detail. The anterior teeth were prepared for 360° veneers and the lower anterior teeth for ultra-thin veneers (Fig. 8). We pursued a minimally invasive strategy, which was quite easy to implement due to the additive approach of the treatment plan. An impression of the situation was taken based on the mock-up, long-term composite resin temporaries (Teilo Lab, Ivoclar Vivadent) were fabricated. During the next three months, the patient was able to acclimatize herself to the new conditions. She was given the opportunity to test the new vertical dimension of occlusion and inform us about any esthetic and functional needs.

Permanent prosthetic restorations

The patient had no trouble adjusting to the new situation. She eagerly anticipated the placement of the permanent restorations. At this stage, she emphasized her requirements again: beautiful and above all, light teeth. We decided to create the veneers with the press technique using a very light material (IPS e.max Press, HT BL 3). The copings for the crowns in the upper and lower jaw were fabricated with the press technique (IPS e.max Press, LT BL 3) and they were individually veneered (IPS e.max Ceram). The long-term temporary crowns served as a template. The restorations were produced according to the established protocol. The requirements of both function and esthetics were fulfilled. As requested by the patient, the anterior teeth were given a bold shape. The surface of the ceramic was imparted with a distinctive micro- and macro-texture, which produced a play of light similar to that of natural teeth (Figs 9 and 10).

Placement of the restorations

In preparation for the adhesive cementation of the restorations, the provisional veneers were removed and the teeth were cleaned. The anterior restorations were checked in the mouth using a try-in paste and the esthetic results were subsequently assessed. The occlusion was checked in detail before the ceramic restorations were etched with 5% hydrofluoric acid for 20 seconds. They were cleaned in an ultrasonic bath and dried. Their contact surfaces were silanized (Monobond Plus). Thereafter, a bonding agent (Silux N) was applied. The individual ceramic components were temporarily stored in a container which protected them from light and contamination. Then the teeth were conditioned. A rubber dam was placed and the teeth were carefully air-abraded with aluminum oxide (0.50 microns). Subsequently, phosphoric acid gel (15%) was applied and thoroughly rinsed off after a reaction time of 15 to 20 seconds. The preparations were dried to the extent that a slightly moist shimmering dentin surface was visible. The application of the bonding agent (Syntac) followed. The restorations were placed with the light-curing luting composite Variolink Veneer (Ivoclar Vivadent). The veneers of the two central incisors were seated and their fit was checked. Then one restoration after the other was placed on both sides. Before the restorations were light cured for the last time, the margins were coated with glycerine gel to prevent the formation of an inhibition layer. We removed excess with fine diamonds and polishers and then we polished and smoothed the margins. After the final examination, we checked the esthetic and functional parameters in particular (Figs 11 and 12). We provided the patient with a protective bite-guard and then released her from the practice.

Result

Esthetic results that work. The all-ceramic restorations look completely natural in the patient’s face. Her facial expression has completely changed. The young woman appears relaxed and enjoying her new smile (Fig. 13). The first recall examination took place three days after the restorations were placed. At that stage, the condition of the soft tissue was excellent. It had fully adapted to the ceramic surfaces (Figs 14 and 15). The success of the treatment was confirmed after the six-month and the twelve-month recalls (Fig. 16).

Conclusion

Sound functional principles, excellent esthetic design skills and an outstanding materials system teamed up to fulfill the patient’s ardent wish for a smile makeover. The restorations have given her new zest for life and they have improved her health at the same time.

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Full range of product offering for dental technicians at Dentsply Sirona

By Dentsply Sirona

As the world’s largest manufacturer of dental products, Dentsply Sirona has a variety of intelligent solutions that have been developed to meet the requirements of dental laboratories. Thanks to the combined power of the business units Dentsply Sirona CAD/CAM, Dentsply Sirona Prosthetics and Dentsply Sirona Implants, these solutions include both materials and devices for conventional manufacturing procedures and materials as well as hardware and software solutions for digital work processes. This results in a decisive advantage for dental technicians: At Dentsply Sirona, dental technicians can find the entire world of dental technology under one roof, and can take advantage of products and workflows that have been co-ordinated with each other.

As one of the central subjects in the area of modern dental technology, CAD/CAM-supported production of dental restorations for the laboratory is playing an ever more important role. With its three business units – CAD/CAM, Prosthetics and Implants – focusing on dental technology, Dentsply Sirona possesses concentrated competence in dental technology and is focused on all steps within this production process. This brings clear added value to the dental laboratory, as it combines specialists for the digital workflow and the inhouse production of restorations: one for dental materials and the inhouse production of restorations and one for the centralized fabrication of abutments and implant-supported structures. In this way the whole process from impression taking to the final restoration can be handled with products from Dentsply Sirona – while still allowing for the freedom to include components from other open CAD/CAM systems. In all branches of dental technology, Dentsply Sirona’s innovation leadership is a benefit to the lab.

Software updates for new possibilities

The current software updates in Lab CAD SW 16.0 and inLab CAM SW 16.0 are perfect examples of such possibilities. They expand the range of indications and provide new functions for an even more efficient computer-aided production process that is oriented towards dental requirements. Now, for the first time, occlusal splints and individual impression trays can be designed with the inLab software via the new plugin inLab Split in the “Removal of Dentures” module. The new inLab Check plugin is being used in dentistry for the first time. The program supports the user via the VEM analysis of the restorations designed for critical stress-sensitive areas, and visualizes them. With screw-retained bridges and bars at the implant level, there is an additional indication that makes the immediate synergy effect with the central production service Atlantis from Dentsply Sirona useful for the laboratory for the first time. With the accurate infoX X-ray scanner and the Atlantis FPD-5 cassette body, inLab SW users can scan cases from all major implant systems for ordering of Atlantis substrucutres. Additional new production possibilities arise from the manufacture of one-piece individual titanium abutments with the inLab MC X5 milling units. The STL/XMI function for implant restorations with screw channels from other CAD software has been expanded to include the current inLab CAM SW 16.0.

New opportunities with Atlantis solutions

The Atlantis solutions line offers a range of digital services that are continuously developed. The possibility to order Atlantis abutments and Atlantis suprastructures via the Dentsply Sirona lab-design software creates new opportunities for the dental laboratory to offer more implant-based restorations to the dentist. The latest innovation from Atlantis is the Atlantis CustomBase solution for single tooth screw-retained restorations. It combines an Atlantis Abutment and an Atlantis Crown with a screw access hole. The crown is cemented to the abutment extracorally and screw-retained into the implant, avoiding potential complications caused by excess cement. The Atlantis Crown can be ordered as a physical crown or as a digital unique file. The digital file is either a “ready-to-null crown” that can be imported directly into the inLab-CAM SW or an Atlantis Core File. This file includes the abutment designed by Atlantis, which can be used by the lab team as the basis for their own crown design. The Atlantis CustomBase solution is available in gold-shaded titanium and titanium, and is available for all major implant systems.1

In addition, the Atlantis patient-specific suprastructure has state-of-the-art design software and additive manufacturing of titanium and cobalt-chrome implant retained fixed restorations.

High performance materials for new materials

Materials are also a part of the range of products from Dentsply Sirona, along with the new denture base material Lutuxion HPPA (High im- pact pour acrylic) that is being pre- sented at the IDS. This new denture material offers extraordinarily high strength, color stability and filling accuracy. At the same time, the material specialist also has a new development in the area of zirconia ready for the ceramic sector. Cercon xt is available with a level of transpareny that is around 10% higher than that of Cercon. xtr. Cercon xt provides the dental laboratory with an even better level of esthetics, particularly for monolithic restorations. True Color Technology ensures a pronounced level of color reliability and reproducibility. As was the case with the Cercon ht, the Cercon xt blanks are available in pre-colored variants in the classic 16 VITA1 colors and in white. Thanks to the standard format (8 mm disks), the new material can be used in all common open CAD/CAM systems, and inLab check plugin is being used in dentistry for the first time. The digital file is either a “ready-to-null crown” that can be imported directly into the inLab-CAM SW or an Atlantis Core File. This file includes the abutment designed by Atlantis, which can be used by the lab team as the basis for their own crown design. The Atlantis CustomBase solution is available in gold-shaded titanium and titanium, and is available for all major implant systems.1

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Conventional procedures, new chances

But the path of progress does not necessarily always move from analog towards digital. Using the example of an additional ceramic innovation from Dentsply-Sirona, i.e. Celtra Press, it is clear that benefits for the dental laboratory can equally result from a contrary development. This is actually a material version of the zirconia-reinforced lithium silicate (ZLS) Celtra Doo that had been developed for CAD/CAM processing. As the name suggests, Celtra Press is now suitable for the traditional press method. Hence the benefits of the special micro-strucure of ZLS can now also be used in this processing method that is used in nearly every laboratory. This includes a particularly high strength of over 500 MPa as well as outstanding mechanical and light-optical properties that in particular achieve a profoundly near-natural chameleon effect. The system components that have been specially matched with the new material ensure rapid processing and outstanding results when using Celtra Press. The Celtra Press investment material is partially responsible for the fact that only a minimal mashing layer is formed during pressing, and this layer is removed by sandblasting during drying. The Celtra Ceram veneering ceramic is available to the laboratory for esthetic individualization.

In addition to this variety of interesting new products, Dentsply Sirona’s range of products of course also includes just as many long-established materials and hardware and software solutions. They allow the labo- ratory to benefit from workflows and products that have been coordinated with each other with a particularly wide range of indications. Due to various certifi- cation and registration periods, not all prod- ucts are immediately available in all coun- tries.

References
1 For details see the Atlantis implant compat- ibility charts
2VITA is a registered trademark of VITA Zahnfabrik H. Rauter GmbH & Co. KG, Bad Säckingen.
Study estimates increase in healthy life years through sugar, fat and salt taxes

By DTI

MELBOURNE, Australia: Modelling the effect of different combinations of taxes on sugar, salt and fat and a subsidy on fruits and vegetables on the death and morbidity rates of Australians, a new study has found that imposing a tax on sugar could avert about 270,000 disability-adjusted life years. In addition, the research estimated that, when combined to maximise benefits, taxes and subsidies could reduce the country’s health care spending by A$3.4 billion (€2.5 billion).

In the Western world, non-communicable diseases, such as obesity, diabetes, cardiovascular disease and dental caries, are mainly attributable to an unbalanced intake of fats, sugars and salt. In order to tackle the burden of these diseases, an increasing number of countries have already implemented or proposed taxes on unhealthy foods and drinks. However, the actual cost-effectiveness of levies and subsidies on certain nutritional items to reduce the burden of diet-induced diseases is uncertain and can only be estimated.

In the current study, researchers at the University of Melbourne simulated the effect of different combinations of taxes on unhealthy foods and a subsidy on fruits and vegetables based on the Australian population of 22 million in 2010. The model analysis set the sizes of the taxes and subsidy such that combined there would be less than a 1 per cent change in total food expenditure by the average household.

The results showed that a tax on sugar had the greatest impact among the taxes simulated. A sugar tax could avert 270,000 disability-adjusted life years (DALYs), the researchers calculated. DALYs are years of a healthy lifespan that are lost to disease. This equals a gain of 1.2 years of healthy life for every 100 Australians alive in 2010, which is a health outcome that few other public health interventions could deliver across the whole population, according to the researchers.

In comparison, a salt tax was estimated to save 130,000 DALYs, a saturated fat tax 97,000 DALYs and a sugar-sweetened beverage tax 12,000 DALYs. As for a fruit and vegetable subsidy, the study was unable to determine an isolated clear health benefit, although it too made for additional averted DALYs and reduced health sector spending, the researchers wrote.

The study adds to growing evidence of large health benefits and cost-effectiveness of using taxes and regulatory measures to influence the consumption of healthy foods. Based on the results of the models, the formulation of a tax and subsidy package should therefore be given more prominent and serious consideration in public health nutrition strategy, they concluded.

The study, titled “Taxes and subsidies for improving diet and population health in Australia: A cost-effectiveness modelling study”, was published online on 14 February in the PLOS Medicine journal.

The findings of a new Australian study suggest that taxes on foods containing unhealthy levels of sugars, salt and fat could help curb health care spending and extend people’s healthy life years. (Photograph: Pixabay/Pexels)
Sunstar supports first European Perio-Diabetes Workshop

By DTI

MADRID, Spain: The link between periodontal disease and diabetes has often been a topic of scientific research. In collaboration with oral health care provider Sunstar, the European Federation of Periodontology (EFP) and the International Diabetes Federation (IDF) recently hosted a workshop in Madrid to address the connection between both diseases and other topics.

Seven periodontics experts and seven specialists in diabetes attended the first European Perio-Diabetes Workshop. The 14 participants represented both the EFP and the IDF, two of the most important international organisations in their respective fields.

In collaboration with Sunstar, the meeting aimed to delve deeper into the relationship between periodontitis and diabetes—a topic that the company has been working on for some time, both on a research and promotional level. Over the course of two days, the panel of experts held wide-ranging debates regarding the existing connections between these two diseases, current epidemiological evidence and the effect of intervention trials on metabolic parameters.

The conclusions drawn from the workshop will be reported on at the end of the year with the aim of new advancements in research on the bi-directional relationship between dental health and diabetes. Sunstar has been promoting and supporting this research for more than 20 years, owing to several of the company’s founding members being involved in the study of diabetes and to the company’s firm commitment to providing the best oral care.

Sunstar drives research

As proof of its commitment, Sunstar is participating in a number of other diabetes-related projects, such as a second workshop with the American Academy of Periodontology (AAP) and the IDF on the classification of periodontal and peri-implant diseases, which will be held in Chicago in the US in November. Furthermore, the company, together with the Spanish Society of Periodontology and Osseointegration (SEPA), will sponsor multiple clinical studies focused on the role of dental practices in identifying prediabetes and undiagnosed cases of diabetes. Sunstar also announced its sponsorship of various studies on the importance of oral hygiene advice provided by primary care physicians.

At the end of the year, the 21st edition of the Joslin–Sunstar Diabetes Education Initiative Symposium will be held in Shanghai in China. This project, promoted by the Joslin Diabetes Center in Boston in the US and the Sunstar Foundation, was launched in 2008 with the purpose of raising awareness among doctors, dentists and patients about the bi-directional relationship between oral health and diabetes mellitus. Furthermore, the symposium creates a platform for debate by experts in the field.

Research grants for young professionals

For several years, Sunstar has collaborated with various scientific societies and clinics to promote research in the field of oral health and to determine its relationship to general health. This is especially evident among new dental professionals, with the most innovative being offered research grants. Examples are the Sunstar Innovation Grant, offered together with the AAP, and the SEPA–SUNSTAR grant, together with the SEPA. The awards have resulted in, among others, the release of the Care for Your Gums, Control Diabetes publication by a dental hygienist in collaboration with the Sociedad Española de Diabetes (Spanish diabetes society), as well as the launch of the first Spanish study to determine the efficiency of dental consultations in the early diagnosis of diabetes.

Over the last few years, Sunstar has introduced a series of social initiatives with the aim of bringing knowledge to all levels of society in order to improve actual diabetes diagnostic treatment and prevention figures.
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* When toothpaste is directly applied to each sensitive tooth for 60 seconds.

References:
Prevalence of Diabetes Mellitus in Odontogenic Infection and Oral Candidiasis

By Dr. Aparna Sharma, UAE

Diabetes Mellitus

Diabetes mellitus (DM) is a group of complex multi-system metabolic disorders resulting from a deficiency in insulin secretion caused by pancreatic β-cell dysfunction and/or insulin resistance in liver and muscles. Diabetes affects more than 9% of the adult population and has a dramatic impact on the healthcare system because of high morbidity and mortality among affected individuals.

Type 1 diabetes results from cellular-mediated autoimmune destruction of pancreatic β-cells, which usually leads to total loss of insulin secretion; in contrast, type 2 diabetes is caused by resistance to insulin combined with a failure to produce enough additional insulin to compensate for the resistance. Type 2 diabetes is commonly linked to obesity, which contributes to insulin resistance through elevation of circulating levels of free fatty acids derived from the adipocytes; these free fatty acids inhibit glucose uptake, glycogen synthesis and glycolysis. In many obese individuals, insulin resistance is compensated for by increased insulin production. However, in one third of obese individuals, β-cell mass is reduced by a marked increase in β-cell apoptosis, which results in inadequate production of insulin.

The prevalence of diabetes mellitus (DM) in odontogenic infections and oral candidiasis is influenced by neutrophil functions, allowing microbial invasion and multiplication. During the period of infection, a high blood sugar level usually complicates both odontogenic infections and candidiasis. All white blood counts, C-reactive protein levels and erythrocyte sedimentation rates show increased levels in DM (+ve) patients than in DM (-ve) patients. The polymorphonuclear leukocytes from diabetic patients, especially those with candidiasis, produced fewer free oxygen radicals and exhibited reduced oxygen burst and intracellular killing of Candida cells associated with the reduced O2− generation during the infection. These suppressed neutrophil functions increase after treatment but do not reach control levels. These studies indicate that DM is a predisposing condition for odontogenic infections and oral candidiasis, that DM-complicated infections become severe because of neutrophil suppression, and that examination of blood sugar level should be essential for patients with oral infections.

It has generally been assumed that oral candidiasis occurs with increased frequency in patients with diabetes mellitus. Several research studies have been done on this and it has been concluded that in the diabetic group, no relationship was found between recent use of antibiotics, total or differential white blood cell count, serum glucose, presence of diabetic retinopathy, or glycosylated haemoglobin values in Insulin Dependent Diabetes Mellitus (IDDM). In IDDM there is a predisposition to oral candidiasis and it has been shown that this predisposition is independent of glucose control. In patients with type 2 DM i.e. Non-Insulin Dependent Diabetes Mellitus (NIDDM), the degree of disease control, as measured by fasting sugar and urinary glucose concentration, is unrelated to oral candidiasis. However, a glycosylated haemoglobin concentration above 12% is significantly associated with oral yeast infection, which suggests that fungal infection of mucous membranes may only be significantly associated with diabetics in patients with a longer history of hyperglycemia.

Tobacco smoking and wearing dentures continuously day and night have been found to be important local factors in chronic oral hyperplastic candidiasis. As per the recent studies, the presence of dentures and glycosylated haemoglobin concentration are independent predictors of the risk of developing candidiasis. This finding suggests that diabetics are more susceptible to fungal infection in areas of moisture and trauma, but, in the absence of deniers, high glycosylated haemoglobin concentration is the most important risk factor.

Conclusion

Being a Diabetic may not place a person at increased risk of fungal infection / other odontogenic infections, unless diabetes control is very poor as evidenced by a glycosylated haemoglobin concentration of more than 12% and, particularly, if the person maintains a very low level of oral hygiene.
New research explores effect of strawberries in oral cancer therapy

By DTI

COLUMBUS, Ohio, USA: As previous laboratory studies have suggested that dietary administration of whole strawberries has substantial potential as a strategy for oral and esophageal cancer prevention, researchers at the Ohio State University have set out to analyze how the fruit’s cancer-inhibiting chemicals affect the oral microenvironment in heavy smokers. The recently presented initial results revealed some intriguing differences between smokers and non-smokers.

“When people eat strawberries, they chew and swallow the fruit quickly. We wanted to develop a method of increasing exposure in the mouth to the beneficial phytochemicals that have been linked with oral cancer prevention, and look for potential differences in that way the salivary enzymes in smokers versus non-smokers metabolize them,” explained study leader Dr. Jennifer Ahn-Jarvis, a postdoctoral fellow at the Ohio State College of Dentistry.

In this approach, Ahn-Jarvis and her team designed a pilot clinical trial to analyze the effects of a specially developed strawberry candy with the nutritional equivalent of two and a half cups of whole strawberries in a group of heavy smokers compared with a control group of individuals who had never smoked. To establish differences in salivary enzyme activity affecting the phytochemical components of strawberries between the two groups, participants were asked to consume the strawberry confection or a placebo four times a day for one week and follow a diet absent of other red and purple fruits and vegetables.

The team then collected saliva and oral tissue samples. From these, they observed significant differences between smokers and non-smokers in salivary enzyme activity and strawberry metabolites in the mouth after administration of the strawberry confection. In addition, the researchers investigated the expression of a select group of 44 genes associated with cigarette smoke and oral cancer risk and were able to validate seven genes independently associated with smokers versus non-smokers.

“This initial data confirmed that something is very different about the oral environment of smokers, which may ultimately influence not only cancer risk but also the potential effectiveness of food-based cancer prevention strategies,” Ahn-Jarvis concluded. “Successful development and use of our novel confection delivery system paves the way for its use in a larger study, which will allow us to more precisely evaluate the effects of smoking and strawberries on molecular endpoints related to oral cancer development.”

Additional analysis of the study data is underway to determine whether there is a correlation between oral exposure time to anthocyanins and reduced oral cancer risk among smokers. Studies are also ongoing to identify strawberry-modulated genes in the oral cavities of smokers that may influence the development of oral cancer.

The initial results of the study were first presented at the annual meeting of the American Association for Cancer Research, held from April 1 to 5 in Washington.

A new pilot study has suggested that cigarette smoke can influence the way cancer-inhibiting chemicals found in strawberries are metabolized.

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Love your teeth
Interview: “A preventative health care system is also a cost-efficient system”

By Kristin Hübner, DTI

On the occasion of this year’s World Oral Health Day (WOHD) on 20 March, Prof Jörg Eberhard from the University of Sydney will be presenting the Australian WOHD lecture titled “Putting the Mouth into Health—Time for a paradigm change in dentistry”. Dental Tribune Online had the opportunity to speak with Eberhard, who was appointed the university’s first Chair of Lifestyle Oral Health in 2015, about the role of preventative care in research and clinical practice and the general need for a more holistic view on medical care and oral health.

Dental Tribune Online: Can you explain what is important by the title of your lecture, “Putting the mouth into health”?

Prof. Jörg Eberhard: Research over the last several decades has shown that oral diseases are linked to general health and other diseases, including cardiovascular disease, diabetes mellitus and rheumatoid arthritis.

The available evidence demonstrating this association is based on epidemiological studies, clinical intervention trials and knowledge of sound biological mechanisms. In the absence of this body of knowledge, a holistic view on medical conditions that includes oral health has not been established in clinical medical practice. “Putting the mouth into health” stands for the strategic vision of overcoming this shortcoming and is aimed at improving the community’s health.

Do you think there is enough awareness among the public about the relationship between oral health, overall well-being and quality of life? There is very limited awareness of the link between oral and general health among the public, however, many health care professionals too are not aware of the association between oral and general health, even though good dental care significantly affects the well-being of patients. Oral health literacy education of the community and health care professionals is a major challenge for the dental profession. Furthermore, teaching of the association between oral and general health to medical students is necessary to establish a holistic view of health in the future.

What is the dental community’s role and that of national health care policies in this matter? The dental community must realise that dentistry is not limited to caries and infected root surfaces, the work of the dental community should be aimed at easing a significant global disease burden and improving the health of the community. Policies must recognise oral health as an integral part of general health and oral health services, inseparable if the population’s health is to be maintained or improved.

Do you think that there should be an increased interdisciplinary exchange between dentistry and medicine? The exchange between dentistry, medicine and other health professions is fundamental to make substantial contributions to medical research and clinical health care in the future. A holistic view on health and disease is obviously highly relevant for clinical decision-making, since medical research has repeatedly demonstrated the interdependence of the various organ systems owing to similar generalised mechanisms.

With the rising burden of diseases such as periodontitis and diabetes on one hand and increasing awareness of prevention on the other, where does dentistry stand today? Since the introduction of antiluona, the dental research community and the dental profession have neglected preventative pathways for decades, and research and clinical activities have focused on restorative treatments. This trend is epitomised by the use of artificial materials like dental implants to restore natural teeth, which have to be extracted because of the lack of adequate preventative treatment. This development is advanced by policies that reward restorative treatments and do not support preventative dental treatments.

What role does the increasing use of highly advanced and complex technology in dentistry play in achieving the goal of retaining the natural dentition for as long as possible? Highly advanced and complex technologies should be limited to those patients who have suffered trauma or who have severe disease or genetic deterioration. Health care systems are not able to provide these technologies to the broader community and therefore these cost-intensive technologies are limited to the privileged. A preventative health care system is also a cost-efficient health care system, relieving individuals and the public from suffering and high costs. Thank you very much for the interview.

Editorial note: This is an abridged version of an interview published in Dental Tribune Asia Pacific Edition, Vol 15, No 3.

Study links periodontal disease, tooth loss and higher risk of death

By DTI

BUFFALO, NY, USA: A new study has suggested that overall mortality in the general population and older women in particular could be reduced by improving periodontal health. Evaluating data on over 57,000 postmenopausal women, researchers at the University at Buffalo found that presence of periodontitis and tooth loss is associated with a 12 percent higher risk of death and 3,589 cardiovascular disease events.

Researchers at the University at Buffalo, who were appointed the university’s first Chair of Lifestyle Oral Health in 2015, about the role of preventative care in research and clinical practice and the general need for a more holistic view on medical care and oral health.

During a mean follow-up period of 3.5 years, the researchers recorded 5,589 cardiovascular disease events and 3,816 deaths. They also found that a history of periodontal disease was associated with a 12 percent higher risk of death and the loss of all natural teeth was associated with a 17 percent higher risk.

In women who saw the dentist less than once a year, edentulism was more strongly associated with cardiovascular disease, diabetes mellitus and rheumatoid arthritis. It is estimated that over half of adults in the U.S. aged 50 and over have some form of periodontal disease. It is estimated that about 20 percent of adults aged 65 and over in the country are edentulous.

The study, titled “History of periodontitis diagnosis and edentulism as predictors of cardiovascular disease, stroke, and mortality in postmenopausal women,” was published in the April issue of the Journal of the American Heart Association.
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Guided Bone Regeneration using NeoGen Ti-Reinforced Membranes: Case Reports

By Neoss Ltd, Cases by Dr. Norbert Hassfurther, Germany

Membranes are used in Guided Bone Regeneration (GBR) to aid in the regenerative healing of bone defects. The membrane is surgically placed under the oral mucosa. It stops the soft tissue from growing into the defect and creates space for complete fill of the defect with regenerated bone.

In many cases where substantial bone regeneration is required, such as vertical bone augmentation, a titanium-reinforced non-resorbable membrane is required to achieve predictable results.

NeoGen Ti-reinforced Membrane is a new generation of non-resorbable titanium-reinforced membrane combining the handling and tissue interactions of expanded PTFE with the enhanced barrier function offered by dense PTFE. The membrane has a three-layer design. The outer, soft tissue friendly, PTFE layer has a tight texture that is impermeable to bacteria; the middle layer is a strong and highly shapeable titanium mesh that retains its shape throughout the healing period; and the inner PTFE layer has an expanded texture that enables predictable hard tissue integration. This combination results in a membrane that is easy to handle and protects the augmentation site in a predictable manner.

This article describes three cases of GBR using a Ti-reinforced PTFE membrane and simultaneously placed dental implants without the use of bone substitutes.

Case 1: Vertical ridge augmentation of severely resorbed mandible

A 52 year old male was referred to the clinic with a severely resorbed anterior mandible due to a failed bone graft after removal of a large cyst (Figure 1). Pre-treatment radiographic assessment (Figure 2) showed that the bone height was inadequate to properly house implants. It was decided to perform a vertical ridge augmentation using NeoGen™ Ti-Reinforced Membrane and simultaneously placed Neoss ProActive Straight Implants.

A full thickness flap with releasing incisions was opened and four Neoss ProActive Straight implants were placed; two anterior and two posterior. The vertical defect between the two anterior implants was 5-6 mm (Figure 3). Autogenous bone cylinders (3.4 x 4-5 mm) were harvested from the oblique line of the mandible in the molar region and placed between the two anterior implants to accelerate regeneration and to act as space fillers. A NeoGen™ Ti-Reinforced Membrane Large was trimmed, shaped, and fitted at the surgical site and secured buccally with two tacks (Figure 4). A stable membrane configuration was achieved using the implants as tent posts (Figure 5). Stress free flap closure was achieved by releasing the periosteum on the buccal side. The soft tissue healing was uneventful (Figure 6).

After 4-5 months, second stage surgery was performed. A mid-crestal incision was used to lift a flap and expose...
A 19 year old female presented with narrow ridge in the premolar area of the upper jaw, two congenitally missing teeth in the esthetic zone and to act as space fillers (Figure 22). Autogenous bone cylinders (3.4 x 4-5 mm) were harvested from the membrane after healing. The soft tissue can easily be separated from the membrane and placed around the implant to accelerate regeneration of the ridge using NeoGen™ Ti-Reinforced Membrane – Medium Interproximal was trimmed, shaped, and fitted at the implant site. Autogenous bone chips collected during drilling of the implant osteotomies were used to fill the palatal dehiscence (Figure 15). Excess bone on top of the cover screws was removed (Figure 16). PEEK healing abutments were connected to the implants and the flap was closed (Figure 17). Radiographic assessment confirmed bone regeneration around the implants (Figure 18). After 3 months of soft tissue healing (50 months after membrane placement) the implants were temporary restored (Figure 19).

Case 3 Vertical ridge augmentation in the aesthetic zone

A 40 year old patient presented with a missing central incisor and a resorbed ridge (Figure 20). It was planned to perform a vertical ridge augmentation with NeoGen™ Ti-Reinforced Membrane – Medium Interproximal and simultaneous implant placement of Neoss ProActive Straight implant.

A full thickness flap with releasing incisions was opened, revealing a large vertical defect (Figure 21). A Neoss ProActive Straight implant was placed an 8 mm vertical defect (Figure 22). Autogenous bone cylinders (3.4 x 4.5 mm) were harvested from the oblique line of the mandible in the molar region and placed around the implant to accelerate regeneration and to act as space fillers (Figure 23). A NeoGen™ Ti-Reinforced Membrane – Medium Interproximal was trimmed, shaped, and fitted at the surgical site and secured buccally with two tacks (Figure 24). Stressed free flap closure was achieved by releasing the periosteum on the buccal side (Figure 25). The soft tissue healing was uneventful (Figure 26-27).

After 6 months, second stage surgery was performed. A mid-crestal incision with releasing incisions was used (Figure 28). The flap was lifted to expose the membrane (Figure 29). The soft tissue can easily be separated from the membrane after healing. The membrane had been regenerated and the ridge had been regenerat...
Considerations for Long Term Success: Implants are Never Forever!

By Dr. Shankar Iyer, USA

This article will emphasize the importance of factors to consider before treatment planning for full arches with implants. It is not uncommon to make misleading promises about implants as an option with unfounded claims of 98% success rates. Most of the survival rates have reported implants for full mouth reconstructions through preprosthetic citations of the original Bränemark’s work published in 1981. Repeated citations of this article and the subsequent follow-up articles have made claims of a high percentage of success with implants. While this is partially true, the circumstances under which these implants survived has been incorrectly extrapolated to other clinical situations. The original Bränemark research was done on unicortical arches with hybrid prosthesis opposing either complete dentures or prosthesis of similar construction.

Patients are now discovering with these highly overstated survival rates, why their implants are failing and need maintenance within a short span. The answer lies in the lack of understanding of biomechanics. The connotation that anything works has led to confusion in the field. The diametrically opposite views of short vs long implants, axial vs angled implants, graft vs grafted solutions, regular vs minis, delayed vs immediate, one vs two pieces, guided vs free hand placements and platform switching concepts have only caused anarchy in the discipline of implant dentistry. Pseudoscience concepts have gained popularity through corporate support and we see opinion leaders vociferously making unscientific claims through limited clinical evidence. A novice finds it very difficult to get involved in implant dentistry because the education is being blessed by companies and not through universities or institutions.

After being involved in implants for over 20 years, I find it to be an humbling experience with cases that I treatment planned two decades ago returning to me for maintenance. Seeing these cases today, I wish I had this experience at that time so I could have served my patients better. Today it has taught me a lot in treatment planning. I am able to prognosticate the outcome and its management in the event of an untoward incident. The lessons in biomechanics have complemented the initial biological responses that can be predicted initially so that the survival of implant therapy is prolonged.

I am a firm believer of long term data and I fear the rapid evolution of products and techniques that claim to be faster and easier. If only I could train my patients osteoconduction to work harder and faster so their bones can heal rapidly, all of the problems can be eliminated and failures can be a thing of the past. The life cycles of cells have been a constant over a million years. It is odd then we are told that implants are approved for immediate load and the cells can adhere to inorganic objects through unique surfaces. My understanding of cell biology may be limited but it is common knowledge that behavior of cells cannot be hastened because the mitotic cycle for the DNA takes the programmed time period for full turnover. Only in disease this rapid uncontrolled proliferation takes place. If this normal cycle is upset then we are look at metaplastic or anaplastic changes according to the turnover rate. Claims made by certain companies that, bone heals faster with their implants is presumptuous. Bone levels are majorly sustained with their unique surface modification is also far from the truth. I have used over 16 different implant systems in my practice over the years and in my training programs and I have found that the osteoclasts are notoriously unbiased. There is bone loss with every system and modifying the surface or creating morphological shifts does not predictably deter bone loss.

In the courses I teach, I recommend waiting for a period of three years after any new feature or biologic product is introduced into implant dentistry. There is no room for latest or newest in clinical practice. If a company is constantly introducing new product lines and changing their designs, there is only one conclusion. They are having trouble and hence they have to change. A robust system that works seldom needs modifications for getting predictable results. Aspirin can never be debunked for its efficacy, because no so old and dated. The original Bränemark external hex (now made out of type 4 Titanium but designed in 1963) is still very functional and workhorse for hybrid prosthesis. The surfaces have improved much but its basic design and biomechanical considerations will be valid for another 50 years. Premature adoption of technology or materials is fraught with shortcomings and unknown consequences. Classical examples of potential catastrophic failures include the TPS coating, HA surface modifications, sintered surfaces, flapless surgeries, guided surgeries immediate loading, costly BMPs and the list goes on.

The message is very simple – one crawls before they walk and you must learn to walk before you can run. The same is true for implant dentistry. The novice today has a wide choice – you can become a complete arch implant specialist with 4 implants and guided surgery over a weekend or spend 5 years learning the basics and judiciously treatment plan cases with customized solutions. Half of the participants of our Maxicourses that we run in the U.S. and overseas have practitioners who have placed hundreds of implants and got their training through corporate education. One does not become a musician by buying a piano or a musical instrument, nor can you become a pilot by buying a plane. Training in implant dentistry has become a fad. Most courses are offered through companies and the company’s sole interest is to sell their systems. There is a whole world of treatment plan cases that is out there before the system can be utilized. Let’s not place the cart before the horse. The void is very apparent the time is now for implementing judicious treatment plans. Let’s serve our patients with what they need and not what we want them to have.

Iyer’s Top 10 Guidelines for Predictable Implantology

1. Diagnose the problem first and don’t treat because you have a tool that you can use.
2. Measure the disease and provide the therapy, don’t sell concepts.
3. Leave what’s new and latest to the risk takers, stick with proven and tried systems.
4. Implants are the last resort in treatment planning – exhaust all conservative conventional modalities.
5. Implants should replace missing teeth not replace teeth.
6. Expensive implants don’t mean success rates are better. Cheaper does not mean everything works – you get what you pay for. There is no substitute for evidence based practice.
7. Consider every implant as a failing treatment plan that is out there before.
8. There is a world of treat- ment planning – exhaust all conserv- ative conventional modalities.
9. There is no substitute for evidence based practice.
10. Consider every implant as a failing treatment plan that is out there before.
entity and the trick is to do the best you can to maintain it as long as you can.

8. Select the system that does not change its product line every year.

9. There are three cuts or faster way to get success in life and implants are no different.

10. The success rates of implants are inversely proportional to the number of years you practice implants.

Case Report

This case reports will provide a rationale for a sound sequential treatment plan in the management of long term failure of dental implants.

Judicious use of implants and their treatment planning should have long term considerations. I used to perform subperiosteal implants and blade implants in the past. One of the reasons for not using them now is not because they fail, but because in the long term, in the event of a failure, it can have some irreversible consequences. This case underscores the importance of over engineering cases from the beginning so that when patients live into their 90s they don’t become incapacitated, not being able to chew their food properly and lose the benefits of implants that they enjoyed for a long period of time.

A 78 year old Caucasian female presented to my practice for rehabilitation and management of a failing maxillary implant reconstruction. She reported having some implants 27 years ago and it has been troubled ever with symptoms of sinus infections and movement of the entire maxillary prosthesis (Fig 9). Radiograph revealed bone loss around the unilateral subperiosteal implants and the blade implants in the anterior maxilla (Fig 3). After careful examination, it was decided that none the maxillary implants was salvageable. Treatment plan was formulated to stage the case to permitting healing of the inflamed soft tissue and resorbed bone.

The entire maxillary frame had to be sectioned and removed piecemeal (Fig 3, 4). An immediate denture was fabricated and the tissues were allowed to heal for a period of two months (Fig 5). A stereolithographic model was created to assess the condition of the remaining bone (Fig 6). A decision was made to reconstruct the maxilla with bilateral sinus augmentation. The anterior sextant had bone loss till the anterior nasal spine. Six months following the augmentation, nine implants were placed in the augmented bone (Fig 7). Septal II surgery was performed after a healing period of 8 months. Impressions were taken (Fig 8). A Universal modified abutment was utilized to bring all of the platforms equigingival (Fig 9).

A ventilation jig was utilized to check for passivity and accuracy of the positions of the abutments (Fig 10). The metal frame was indexed, cast and tried in (Fig 11, 12). Face bow transfer record was obtained for orientation relationship. (Fig 13) Porcelain overlay for an FPD prosthesis was processed and inserted (Fig 14, 15). A mutually protected occlusal scheme was designed (Fig 16). The patient’s vertical was maintained. The post op radiograph reveals a stable outcome (Fig 17). The anterior cantilevered crowns provide for optimal esthetics in the extremely resorbed anterior maxilla. The post operative outcome provided an esthetic and functional rehabilitation of the failing implant FPD (Fig 18). The provision of pontics enhanced the outcome in the esthetic zone and in this case it favored the design due to the atrophy that precluded implant placement in the premaxilla. The case has been in function for over 5 years and the patient has been on re-ccare every 4 months.


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Orthodontic Extrusion of Traumatically Intruded Upper Central Incisor

By Prof. Emad Hussein, Jordan, Assist. Prof. Mohammed Jaradat, Jordan, Assoc. Prof. Alev Aksoy, Jordan, Dr. Fadi Khuffash, Palestine, Prof. Ahmad Hamdan, Jordan

Introduction
The incidence of traumatic dental injuries varies with age and has a high prevalence worldwide.[1] In most cases, the front teeth are the most affected, with the central incisors being at the highest risk of dental trauma.[2][3] The maxillary arch is involved in a higher percentage (95.72%) of incidents when compared to the mandibular arch.[4]

Intrusion luxation can be defined as the form of traumatic dental injury that leads to tooth displacement deep into the alveolar bone. This usually results in severe complications (pulp necrosis, inflammatory root resorption, ankylosis), for this reason it is classified as a severe form of traumatic dental injury.[5][6]

Management of traumatically intruded anterior teeth is of prime importance, since these teeth are so important both aesthetically and functionally. Management of these traumatised teeth differs according to the root apex maturity and the severity of the intrusion luxation itself. Pulp necrosis occurs in one hundred percent of cases involving intrusion luxation of mature permanent teeth with fully-formed apex and in 62.5% of those involving intruded teeth with open apex.[7][8] This case report aims to emphasise the importance of immediate orthodontic loading of traumatically intruded mature permanent teeth with closed root apexes.

Diagnosis and Etiology
A 15-year-old female was referred to the orthodontic clinic for dental evaluation. Her chief complaint was, “I have a displaced upper front tooth following a sport accident.” (Figure 1) During orthodontic evaluation, the patient reported that she had received a sport injury one day ago. As an emergency treatment, she received immediate therapy by a general dentist, consisting of bleeding control, prescription of an antibiotic and an anti-inflammatory analgesic. Clinically, “The patient presented a dolichofacial pattern and normal occlusion, with well-aligned teeth, except for the traumatised tooth.” (Figures 1 and 2). Symptoms of temporomandibular disorders were not found. Pulp vitality of the traumatised tooth was tested with ethyl chloride, and a negative result indicated the presence of necrotic pulp tissue.

Treatment Objectives
The patient had an intruded upper left central incisor tooth as a result of a traumatic accident, so the following treatment objectives were established:
1. Extrude the intruded upper left central incisor into its original physiologic position
2. Allow easy access for necrotic pulp extirpation from the intruded incisor

Additionally, endodontic treatment was also planned in order to extirpate the necrotic pulp (the tooth had complete root development), thus minimising the chances of external root resorption and tooth loss.

Treatment Plan
The treatment plan should aim to extrude the intruded tooth back into its original physiologic position within the upper arch. Three treatment alternatives were available:
1. Giving the tooth its own chance to re-erupt spontaneously
2. Surgical repositioning for the intruded tooth
3. Orthodontic extrusion.

The authors preferred the third treatment option, so the treatment plan was to orthodontically extrude the traumatically intruded upper left central incisor as soon as possible following the traumatic injury. Additionally, endodontic treatment was also planned in order to extirpate the necrotic pulp (the tooth had complete root development), thus minimising the chances of external root resorption and tooth loss.

Treatment Progress
Two days after the traumatic injury, the patient was instructed to follow a soft diet, with the aim of avoiding any traumatic contact with the traumatised tooth.

Three weeks following the start of the alignment phase, the tooth was extruded enough (close to the level of the other central incisor) to allow easy access for necrotic pulp extirpation (ethyl chloride examination confirmed the necrotic pulp status).
The necrotic pulp was extruded two weeks following the start of orthodontic treatment and a non-setting zinc oxide eugenol (ZOE) dressing was placed for about three weeks to prevent any pulp remnants and to minimize any inflammatory root resorption.

Then 0.045 and 0.061 inch NiTi wires (Ortho Technology Company) were used, in order to complete the alignment phase by moving the traumatised tooth back into its normal and physiological position. The alignment phase took about three months, after which the tooth was normally positioned within the line of the arch. (Figure 4. a-d)

The result was maintained with an upper fixed lingual retainer (Ortho Technology) extending from upper right canine to upper left canine. (Figure 5, 6)

By the end of treatment, the gingival margin of the affected tooth was not level with the central incisor (Figure 4. A), this may be the result of the rapid extrusive forces which were applied to the intruded tooth. A gingivectomy for the upper left central incisor was performed about one year later in order to level it with the gingival margin of the right central incisor. (Figure 7,8)

**Discussion**

Traumatic intrusion luxation is a serious type of injury, and it occurs most frequently in upper incisors. [4] Management of traumatically intruded permanent teeth differs according to the root apex maturity and the severity of the luxation injury itself. In case of mild intrusion of teeth with incomplete root formation, the intruded teeth are given the opportunity to re-erupt spontaneously within three weeks. [10] [11] [12] If the intruded tooth does not erupt by itself during the three week observation period, it is preferable to extrude the tooth, in order to replace it in the line of the arch.

In our case, spontaneous re-eruption was not preferred because, according to the UK national clinical guidelines, the chances of spontaneous re-eruption in mature teeth are low, especially if the intrusion is above 3 mm and, if eruption occurs, the tooth will not reach up to the permanent occlusal level. [13] [14]

As a result, the authors preferred immediate orthodontic extrusion, aiming to eliminate the chance of ankylosis. This concurs with Andreasen, who states that orthodontic forces should be applied within the first few days following the intrusive luxation injury. [14] The initial arch wire was thin with low force to minimize any heavy and non-physiologic loading on the luxated tooth.

Endodontic treatment was mandatory in our case, since the intruded tooth had a fully-formed root with completely closed apex. [7] The pulp was extruded, to avoid the development of external root resorption, which can lead to tooth loss. [15] Surgical repositioning was not preferred because it usually produces severe trauma to the periodontal ligament, leading to replacement resorption and tooth loss. [16]

**Conclusion**

The application of immediate orthodontic extrusive forces in repositioning the traumatically intruded upper left permanent central incisor was effective. Early tooth repositioning created easy access for pulp extrusion which probably minimised the chances of external root resorption, ankylosis and hence tooth loss.

**Acknowledgements**

We have to thank Dr Majd Salameh and Shaddad Almecheri for performing the endodontic treatment of the traumatically intruded upper central incisor.

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A Practical Treatment Objective: Alveolar Bone Modeling with a Fixed, Continuous-Arch Appliance

By Thomas W. Barron & Frank Bogdan, USA

Bone is a dynamic tissue that is continuously adapting its structure via the processes of remodeling and modeling. Remodeling is the coupled sequence of osteoclastic and osteoblastic formation involved in physiologic turnover. It is necessary to adjust internal architecture in response to mechanical needs, repair microdamage in the bone matrix, and to maintain plasma calcium homeostasis. Remodeling can only be observed histologically or by chemical assay of biomarkers. Modelling is a change in the size and shape of a bone that can be observed and measured radiographically. It is the net gross anatomic result of bone resorption and formation on a given bone surface in response to growth and development or mechanical load. These processes are well accepted phenomena in the field of physiology.

In the orthodontic literature, it is widely held that the alveolar bones of the maxilla and mandible are immutable—that once formed, their size and shape cannot be changed significantly with tooth-borne, continuous-arch orthodontic appliances. Attempts to do so have been associated with root and cortical plate resorption, loss of periodontal attachment and unstable tipping of teeth. Under this paradigm, orthodontic treatment must maintain the existing size and shape of the alveolar bone. In many cases, this can only be accomplished with surgery, tooth extraction, or separation of the midpalatal suture.

In recent years, there has been a growing body of clinical evidence bolstered by studies that challenge the immutability of the alveolar bone and the mandible to.vert to the existing dental-vestibular arch form.

The purpose of this article is to present a review of the literature challenging alveolar bone immutability along with clinical cases treated with passive self-ligating orthodontic brackets and low friction/self-ligating protocols that demonstrate alveolar bone modeling.

Challenging Alveolar Bone Immutability

The alveolar process is defined as that part of the maxilla and mandible that forms and supports the sockets of the teeth (Fig. 1).

It includes the thin lamina of bone that surrounds the root of the tooth and gives attachment to the principal fibers of the periodontal ligament. It also includes the supporting inner and outer cortical plates of compact bone along with the spongylia bone between the cortical plates. Though anatomically, no distinct boundary exists between the body of the maxilla or the mandible and their respective alveolar processes, the bone surrounding the teeth from root apex to crest of the socket is considered to be the alveolar bone.

By means of the teeth, alveolar bone can be loaded with biomechanical force. The cellular response of the PDL to orthodontic force has been well characterized on both the pressure and tension sides of the bone socket surrounding the root of the tooth. The periodontal ligament is translated through the trough of bone confined by the buccal and lingual cortical plates. Until recently, modeling—or changing the size and shape of the developed alveolus by translating the cortical plate—was not deemed possible with fixed orthodontic appliances, and consequently, has not undergone rigorous study. The critical questions that must be answered to challenge alveolar bone immutability and foster an acceptance of treatment modalities that are not confined to the existing size and shape of the alveolus are:

1. Is the alveolus, confined by the buccal and lingual cortical plates immutable or is there evidence that it can undergo modeling?
2. If it can undergo modeling, under what conditions can it occur?
3. Can fixed, continuous-orthodontic appliances induce alveolar bone modeling?
4. Is there a cellular mechanism of action that can explain orthodontically induced alveolar bone modeling?

Myo-Periosteal Induction of Alveolar Bone Modeling

Dr. Ralf Frankel described the transverse alveolar bone modeling observed in periodontally treated patients who used his Function Regulator Appliance (Fig. 2). He reported that the increase in the transverse dimension observed in these patients is achieved primarily through the action of the buccal shields on the apical bone. The apical shields disrupt the equilibrium of forces acting on the dental-vestibular by removing the pressure of the buccal musculature and allowing the light continuous force of the tongue to dominate. According to Frankel, when the forces of the cheeks are eliminated, the teeth tip laterally in the direction of least resistance. The alveolar wall in the radiolar area are likewise deformed in a buccal direction.

Furthermore, the acrylic shields extending into the vestibule exert a constant outward pull on the connective tissue fibers and muscle attachments that is transmitted to the alveolar bone by the fibers of the periosteum. Apposition of buccal bone aids in the lateral movement of the dentoalveolus. The ability of periodontal tension to induce apposition of bone on the lateral alveolar has been demonstrated in the animal studies of Altmann and Harvold. In addition, a study by Benito, et al., utilizing metallic implants placed in the maxillae of patients treated with the Frankel appliance demonstrated that widening of the maxilla was due to deposition of new bone along the lateral border of the alveolar bone rather than increased growth at the midpalatal suture.

This phenomenon of alveolar modeling, specifically lateral translation of the alveolus, achieved by disrupting the equilibrium of the inner and outer oral musculature and periodontal tension is consistent with the Functional Matrix Theory of Moss. While granting the innate growth potential of cartilage and bone, his theory holds that growth of the face occurs as a response to functional needs and neuromuscular influences and is mediated by the soft tissue in which the jaws are embedded. The theory, simply stated, is that bones do not grow but are grown, emphasizing the ontogenic priority of function over form. The Frankel appliance achieves a change in form by changing the function of the matrix tissues of the oral musculature.

Load-Induced Alveolar Bone Modeling

It is commonly observed in the field of dental medicine that the continuous load of a growing odontogenic cyst can significantly model the alveolar bone of the maxilla and mandible, causing remarkable displacement of the cortical bone. This pathologic process is well established and has been extensively documented in case reports and textbooks. The interstitial pressure of various odontogenic cysts have been measured and found to exert an ultra-low force load on the alveolar bone. This phenomenon clearly demonstrates that the developed alveolus can be modeled via pathologic induction with light, continuous force. Another commonly observed example of

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Page 14
bone modeling is the bulge of the cortical plate associated with a palatal impacted canine. The impacted tooth is typically associated with an enlarged follicle. When the canine is exposed and brought into the center of the alveolus, a normal palatal contour returns.

Kokich and Kokich24 demonstrated localized modeling of the adult alveolus in response to tooth displacement. Light, continuous orthodontic force was employed to distalize a tooth into the atrophic alveolar ridge associated with a congenitally absent second premolar. The distalized tooth moved with its supporting bone, changing the size and shape of the atrophic alveolus (Fig. 3).

Fontenelle reported alveolar bone modeling with a passive/active dissociation appliance in non-growing patients.25 The appliance (Fig. 4) consisted of a passive, rigid-cast lingual arch and active, low-modulus wires activated between the cast lingual arches. Disociation of the passive and active components facilitates the application of low, constant force load with near constant moment-to-force ratios, resulting in bone modeling induced by dental displacement. Clinical cases were shown demonstrating lateral modeling of the alveolus as observed by Frankel and localized alveolar modeling with tooth displacement as observed by Kokich and Kokich.

Williams and Murphy described alveolar bone modeling with evidence of apposition of bone on the maxillary bicuspid alveolus in permanent dentition patients (Fig. 5a). This was induced by a light, continuous load applied bilaterally to the maxillary alveolus with the Max 2000® alveolar development appliance (Fig. 5a). Their appliance consists of two nickel-titanium springs embedded in and connecting separate acrylic panels in a framework retained by springs activated one-half of a bracket length between the mandibular permanent central incisors and primary canines, and between the maxillary left permanent lateral incisor and primary first molar. Low-torque brackets were selected for the upper and lower incisors to help minimize proclination from the force of the spring. Damon wire sequence protocols were observed.

**Result**

Pre- and posttreatment images demonstrate the absence of the lamellar pattern characteristic of mature bone and polarized light demonstrated a woven bone pattern characteristic of immature or new bone (Fig. 6). In addition, fractional analysis of the polarized light specimens demonstrated fractal patterns suggestive of woven bone modeling.

**CASE STUDY 1**

**CHILD ALVEOLAR MODELING: Pretreatment**

**Diagnosis**

A 9-year-old male patient presented in the mixed dentition with premature loss of his maxillary left primary canine with space loss and a blocked-out, unerupted permanent canine. His mandibular arch presented with severe crowding and completely blocked-out and unerupted lateral incisors. He exhibited normal circumoral muscle tonus and lip competence. The lateral cephal showed upright maxillary and mandibular incisors.

**Treatment Summary**

Phase I mixed dentition treatment was initiated with Damon passive self-ligating appliances, including brackets placed on all the non-mobile primary teeth. Copper Ni-Ti wires (.014”) and light NiTi coil springs were activated one-half of a bracket length between the mandibular permanent central incisors and primary canines, and between the maxillary left permanent lateral incisor and primary first molar. Low-torque brackets were selected for the upper and lower incisors to help minimize proclination from the force of the spring. Damon wire sequence protocols were observed.

**Result**

Pre- and posttreatment images demonstrate the absence of the lamellar pattern characteristic of mature bone and polarized light demonstrated a woven bone pattern characteristic of immature or new bone. (Fig. 5b). Clinical evidence has been reported supporting the ability of passive self-ligating brackets to deliver lower magnitude forces compared with elastomeric-ligated appliances applied to the same malocclusion in an in vitro model (Fig. 7). Evidence has also been reported supporting the ability of passive self-ligating brackets to achieve a reduction in the frictional resistance to sliding at the bracket/wire interface.24–27 The resultant load applied to the teeth and transmitted to the alveolar bone eccentrically decreases as the frictional resistance to sliding and the force required to overcome it decreases. Clinical evidence has been reported demonstrating significant widening of the dental arches following treatment with the low-friction/low-force Damon System.28–33 An increase in the transverse dimension of the alveolar bone has also been reported in response to the low biomechanical load delivered by this treatment regimen.24–27

The following case reports provide examples of the alveolar bone modeling the authors have observed over a combined 28 years of experience utilizing the Damon passive self-ligating fixed appliance and treatment protocols advocated by Dr. Dwight Damon.
CASE STUDY 2
PERIADOLESCENT ALVEOLAR MODELING:

Diagnosis
An 11-year-old female patient presented with a Class I jaw relationship and severe tooth size/arch length discrepancies with 9 mm of crowding in the maxillary arch and 15 mm of crowding in the mandibular arch. Her mandibular incisors were upright at 89° to the mandibular plane and she exhibited normal circum-mental muscle tonus and competent lips. Her parents wanted to attempt a nonextraction treatment plan. Informed consent was obtained and a therapeutic diagnosis was initiated with a reassessment planned for approximately 6 to 9 months to determine if the nonextraction attempt could continue or if extraction would be required.

Treatment Summary
Damon protocols were employed with initial .013" Copper Ni-Ti wires and NiTi open-coil springs activated one half of a bracket width to begin to create space for the unbracketed, blocked-out teeth. Eyelit attachments were placed on the lingually blocked-out teeth and lightly ligated to the coil springs with enough force to minimally deflect the archwire. Since the alignment at the 10-week appointment was deemed insufficient to engage a larger wire and comfortably close the bracket door, the initial wires were inspected for deformation and replaced. The springs were then reactivated, the blocked teeth religated and the patient reappointed for 8 weeks.

Although in significantly crowded cases the transitional wire is typically a .014" Copper Ni-Ti wire engaged in preparation for a .014" x .025" Copper Ni-Ti wire, at the fifth week bracket alignment was again deemed insufficient for rectangular wire engagement so a .014" Copper Ni-Ti wire was placed, the springs were reactivated and the blocked-out teeth religated. At subsequent appointments as space was created, initially blocked-out teeth were bracketed and engaged with .014" Copper Ni-Ti wires. At 8.5 months, the decision was made to continue with the nonextraction treatment plan. This severely crowded case did not progress beyond the .014" Copper Ni-Ti wires until 12 months into treatment.

Results
The final result was obtained after 27 months of treatment. Retention included bonded lingual wire retainers and clear, vacuum-formed Essex-style removable retainers to be worn while sleeping. Size-corrected lower occlusal photographs taken at initial bonding and debonding illustrate the change in the size and shape of the mandibular alveolus induced by passive self-ligation treatment. By the three-year posttreatment follow-up appointment, teeth #8 and #9 had been crowned and the bonded maxillary lingual wire had been removed. The patient reported infrequent removable retainer wear and the alveolar modeling obtained had remained remarkably stable.
PERIADOLESCENT ALVEOLAR MODELING:
Results

CASE STUDY 4
ADULT ALVEOLAR MODELING:

Diagnosis
A 21-year-old female patient presented with an anterior open bite and bilateral, posterior cross bites. Her dental history included Phase I expansion and Phase II comprehensive treatment with another orthodontist. She was referred by an oral surgeon for orthodontic alignment prior to orthognathic surgery to correct the open bite and constricted maxilla.

Treatment Summary
Treatment was initiated using PSL appliances and low-friction/low-force protocols with 0.025" posterior cross elastics engaged bilaterally from attachments on the lingual surfaces of the maxillary first and second molars. The occlusion was disarticulated with flat-plane composite build-ups on the occlusal surfaces of the maxillary first and second molars. When the case progressed to the 0.019" x 0.025" stainless steel wires, the maxillary arch was sectioned bilaterally between the lateral incisors and canines in preparation for surgery. The surgeon, however, deemed that orthognathic surgery was no longer required. The case was finished with vertical elastics and retained with bonded lingual retainers and a Damon Splint retainer prescribed for nightly wear for the initial 12 months of retention.

Results
Treatment was completed in 21 months. Size-corrected upper occlusal photographs taken at bonding and debonding illustrate the change in the size and shape of the maxillary alveolus induced by passive self-ligation treatment. Unfortunately, the patient relocated and was unavailable for long-term follow up.

ADULT ALVEOLAR MODELING:
Pre-/Posttreatment Comparison Demonstrates Alveolar Modeling. Surgery was Precluded in this Case.
Discussion

The case reports presented demon- strate examples of the change in the size and shape of the mandibu- lar and maxillary alveolar bone observed in adolescent, adult and children treated with a passive self- ligating, continuous archwire and Damon low-friction/low-force treatment protocols. Specifically, the increase in the transverse di- mension of the alveolus appears to be the result of lateral translation of the buccal and lingual cortical plates induced by the biomechanical load applied to the teeth and transmitted to the alveolar bone. These cases pro- vide additional clinical evidence for the ability of the alveolar bone to un- dergo biomechanical load induced modeling.

As Frankel had done previously with his Function Regulator appliance, Damon has proposed a mechanism of action for the dentoalveolar re- sponse to his treatment regimen. Based on clinical observations and analysis of photographs, plaster study model measurements and medical CT surveys of treated cases, he suggests that the light, continu- ous force delivered by his treatment approach disrupts the equilibrium of the tooth positions maintained by the inner and outer oral musculature acting on the alveolus and dentition. When the anterior component of the force acting along the continuous archwire is kept low, it is mitigated by the resting pressure of the lip in patients with adequate circumoral muscle tonus. The posterior compo- nent of force is likewise resisted by multi-rooted molars along with the ascending rami in the mandible and the tuberosity in the maxilla. A resultant lateral component of force is expressed and transmitted from the teeth to the alveolar bone, induc- ing bone modeling or posterior arch adapta- tion as he describes it.

The OSMI findings of Badawi sup- port Damon’s proposed mechanism of action, specifically the assertion of a lower anterior vector of force delivered with a passive self-ligating appliance compared with an elastic- ligated appliance applied to the same simulated malocclusion. In addition, there is a cellular mecha- nism of action that supports alveolar bone modeling induced by tooth dis- placement. Figure 8 from Graber de- scribes bone modeling occurring in the periodontal ligament and on the periosteal surfaces resulting from net apposition of bone in the direc- tion of the line of applied force and net resorption of bone away from the direction of force. Furthermore, this ability to move bone with a light, continuous load applied to the teeth has been corroborated in the sagittal dimension by Melser and Allais.

Despite the evidence presented in this article, there remains consider- able debate regarding the immuta- bility of the alveolar bone and the treatment response to low-friction/ low-force passive self-ligating appli- cators. Rigorous investigation should be undertaken to validate and un- derstand these clinical observations. Future clinical investigations should incorporate case selection criteria that include subjects with adequate circumoral muscle tonus as well as close adherence to the established treatment protocols as described in the case reports above.

In addition, future CBCT analysis should consider the voxel size and resolution of the machines used in making alveolar bone determina- tions as well as the time period in which the posttreatment assess- ments are undertaken to allow ad- equate time for completion of sec-
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