Poor dental health may predict reduced ability to leave one’s house

Getting to the 00.00 point

The story behind IPS POWER Implant uncovery with the Picasso diode laser

A time-saving procedure to create natural esthetics in posterior restorations

By Ivoclar Vivadent AG

A flowable bulk-fill composite complements the existing Tetric N-Ceram Bulk Fill. For many years, the universal composite Tetric N-Ceram has been proven successful in restorative dentistry. As part of the ongoing development of restorative materials, a further innovation is now launched on the market: Tetric N-Flow Bulk Fill. The new flowable composite complements the mouldable Tetric N-Ceram Bulk Fill composite. In essence, Tetric N-Flow Bulk Fill is based on the composition of Tetric N-Ceram Bulk Fill. The material is applied as a bulk-fill base in Class I and Class II restorations just like the existing version, it can be light-cured in large increments of up to four millimetres.

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Another strength of the new Aessencio technology is the Ivocerin light initiator and operatory light.

The light sensitivity filter extends time savings of up to 55% and operatory light. The light sensitivity filter extends the working time under ambient light. The light sensitivity filter extends the working time under ambient light.

Ivocerin light initiator and Aessencio technology

Another strength of the new composite lies in the Aessencio technology. This technology causes the translucency of the material to decrease from 28% to approx. 10% during polymerization. In combination with the highly reactive patented Ivocerin light initiator, the Aessencio technology enables composite increments up to a thickness of 4 mm to be cured, while at the same time a low dentin-like translucency can be maintained, allowing, among other things, disclosing tooth structure to be masked. This property makes Tetric N-Flow Bulk Fill the ideal companion for Tetric N-Ceram Bulk Fill, which features an enamelled-like translucency. Tetric N-Flow Bulk Fill should be covered with a load-bearing composite (e.g. Tetric N-Ceram Bulk Fill or Tetric N-Ceram). For restorations in deciduous teeth, the material can be applied without a capping layer.

Contact Information
Vivadent AG
Bennerstrasse 2
9404 S.Vaduz/Schachenstein
Tel: +423 235 39 35
Fax: +423 235 39 60
E-mail: info@ivoclarvivadent.com
www.ivoclarvivadent.com

New: Tetric N-Flow Bulk Fill

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Director Research and Development

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DENTAL TRIBUNE INTERNATIONAL
Freiburg 79, 74811 Freiburg, Germany
Tel: +49 761 48 224 012
Fax: +49 761 48 224 973
www.dental-tribune.com
info@dental-tribune.com

DENTAL TRIBUNE ASIA PACIFIC LTD.
Suite 6, 20th Floor
Harvard Commercial Building
105-111 Thomson Road, Wan Chai, HK
Tel: +852 3113 6177
Fax: +852 3113 6199

THE AMERICA, LLC
21 West 23rd Street, Ste 500
New York, NY 10011, USA
Tel: +1 212 244 7181
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PTYLLC@dental-tribune.com
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DIRECTOR
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yd@vivadent.com
Tel: +370 51 21 28 38

DESIGNER
Longi Bźr胭k
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PRINTING HOUSE
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Direct Restorative in treating function and aesthetics

By Dr. Jan van Lierop

Do we always respect the true role of the anterior dentition? Or do we get caught up in the creation of beauty to the disadvantage of function. In this clinical case we show how the understanding of the entire occlusal complex is critical in establishing a beautiful and stable long-term result. By first creating stable anterior and canine guidance we can protect the dentition and the restorations, adding to long-term stability of both.

Understanding

When faced with obvious aesthetic shortcomings (as in Figure 1), we have to guard against getting caught up in the obvious. Often by looking closer can we identify the true underlying cause. Here the signs of abstraction, loss of posterior support through molar erosion and the lack of canine guidance (Figure 2 and 3) had played a critical role in the eventual wear and chipping of the anterior teeth (Figure 4), part of the initial aesthetic complaint.

Function

To establish a stable aesthetic result, it is essential that we stabilize the occlusion first. This was achieved by systematically restoring the palatal anatomy of the anterior teeth (Figure 5 and 6) using direct restoratives (Filtek™ Supreme XTE A2B) in a single visit. This established critical anterior and canine guidance (Figure 7). In a subsequent visit, only a few days later, the lower posterior teeth were restored to their original anatomy (Filtek™ Supreme XTE A2D) thereby creating total occlusal contact and stability (Figure 8).

Aesthetics

3 months after the occlusion had been stabilized, anterior aesthetics was created following a digitally designed plan (Figure 9). By transfering the digital plan to an analog model we could create stents to guide in the aesthetic restoration (Figure 10). By using Filtek™ Supreme XTE (shade A2D and A1E) in a layering technique a beautiful result was achieved (Figure 11 and 12). Realizing the ultimate goal of achieving protective function and long-term aesthetics.

Professional development with 3M Health Care Academy


By 3M

The Dentistry in Practice event held in Warsaw in May, offered through the 3M Health Care Academy, was dedicated to all dentists seeking practical tips to solve daily problems in their practices. Throughout the event participating international dental practitioners had the opportunity to share their most successful techniques and newest science that allows dentists to overcome their everyday challenges.

Science in and around us

The International Science Knowledge Solutions Expert Meeting in Warsaw hosted 20 specialized sessions led by 20 experienced dental professionals within Central Eastern Europe and Middle East and Africa Region. They explored and discussed how science is driving evolutions in dentistry and how it can be applied to one’s daily work. The sessions covered clinical cases and innovative technologies that make it easier to find solutions for better clinical outcomes as well as improve the safety, health and comfort of the patient. With easy access to the knowledge exchanged by experts on www.dentistryinpractice.com, 3M, aiming to be a partner in the daily work of dentists, has developed this innovative and convenient exchange of knowledge to improve dental practices through easy-to-apply solutions. This will help specialists to continue their education in a modern way, and to share their learnings and experiences throughout the dental community.

With www.dentistryinpractice.com, 3M helps science to move out of the laboratory and into daily practice for optimal clinical outcomes and the highest patient satisfaction.

Solutions for simpliﬁed and better outcomes

Every dentist can be a part of the 3M conference, with access to its content online. After registering, our partner dentists will receive notifications every two weeks about new conference video materials, which will be regularly uploaded on dentistryinpractice.com. 3M, aiming to be a partner in the daily work of dentists, has developed this innovative and convenient exchange of knowledge to improve dental practices through easy-to-apply solutions. This will help specialists to continue their education in a modern way, and to share their learnings and experiences throughout the dental community.

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Will India be the next big dental market?

By DTI

HYDERABAD, India: The Indian dental care services market is estimated to experience a double-digit growth rate, reaching up to US$2.2 billion (147 bn. Indian rupees) by 2020. According to Ken Research, India has already witnessed a compound annual growth rate of 12 per cent for the period of 2010 to 2015 as dental awareness and disposable income have increased. Taking into account factors such as continued economic growth and reforms, India might have the potential to become the largest market for dental products and materials worldwide.

According to the Indian Dental Association, India’s population of 1.2 billion had access to 180,000 dentists, including 35,000 specialists, in 2014. This number is projected to grow to 300,000 by 2018. Around 5,000 dental laboratories and 300 dental institutes currently provide basic and advanced oral health care. Expected growth in the number of dental chains will increase the share of organised dental clinics across the country. Although the vast majority of dental products are imported from Germany, the US, Italy and Japan, foreign companies continue to invest in India and establish production units.

Most importantly, patient demand for better health care facilities has increased. As a country without a unified health care system, more Indians are purchasing private oral health insurance. A rising elderly population, changing lifestyles, and increased private and public health care expenditure are additional factors for the growth of the dental care market. Furthermore, dental companies are focusing on improving dental services for tourists seeking lower-cost treatment across India.

Ken Research recommends that domestic companies focus on effective marketing strategies and attractive discounts. In addition, free dental check-ups, dental outreach programmes and mobile clinics should improve the oral health care situation in less-developed regions, as substantial differences between rural and urban areas regarding access to dental clinics remain. The current dentist–population ratio is reported to be 1:9,000 in urban and 1:200,000 in rural areas. Many Indian citizens, especially in poorer areas, have yet to be educated about preventative oral health care.

The publication, India dental care service market outlook to 2020—Increasing awareness on oral care and rising number of organized players to foster future growth, is available online at www.kenresearch.com. The report covers various aspects, such as market size, structure and segmentation, as well as the demographics of domestic and foreign customers.
Splyce ID: Designing Bespoke Modern Wonder Clinics - Part IV (Circular Shapes)

By Menaka Ramakrishnan, India

Circles are congruous with infinity. The shape signifies interminability, peace, balance and harmony. So how does one incorporate this into a Dental Clinic? Splyce Interior Design ideated the most efficacious ways to do this.

Four years ago Splyce Interior Design conceptualized a clinic for the same client in Dubai Healthcare City. The relaxing aura and ambiance have gotten several laurels. The Same Day Dental Clinic attributes their triumph to impeccable service and seamless interiors.

The specialty of Splyce is creating novel yet concrete designs, particularly clinics. The effective functionality of the space is imperative followed by adding precise atmospheric elements. Dr. Costa, leading dentist at the Same Day Dental Clinic, had entrusted Splyce with this project before. Now, the clinic had to be customized to dentist-clients on Jumeirah Beach Road, Dubai. Dr. Costa has been practicing since 1984, therefore the space needed to reflect his astounding qualifications and experience.

Ranjit Prasad, Creative Director of Splyce, envisioned circular shapes along with shades of white and grey to be used within the clinic space. The first facet of this is the flamboyant, circular ceiling crystal chandelier that is placed right at the reception. The very presence of this chandelier fills the customer with tranquility. Consequently all other areas of the clinic branch out from this central zone in an organic distribution. It’s so important to feel relaxed at a dental clinic, principally before intricate procedures. Splyce manages to set a peaceful tone as soon as the customer sets foot into the clinic.

Circular clouds lights are placed above each treatment chair in the procedure rooms. These lights cite a visual of clouds. White circular lights are also placed in strategic locations throughout the clinic such as the waiting areas. Curvilinear pieces of furniture are used in the reception and meeting rooms. This complements the Zen-like sensation.

The client required superior materials for this project. As the colour palette was mainly white and grey, the choices were limited. The colour white signifies sterility and cleanliness. Therefore the floor has been exclusively built around this shade. Warmer tons of white leather have been used for the waiting and relaxation areas to emulate cosiness. Solid surface resin was chosen as the countertop material. The dental chairs also imitate this leitmotif. Carpets were placed in the meeting rooms and admin areas to entice the reverberation of sound.

Natural light has been fruitfully used as well, with large windows being placed in the meeting room and waiting areas. Glass windows coupled with the colour white enlarges the space. The aesthetic is analogous to being in a premiere spa. The technology used is up-to-the-mark as well, predominantly in the dental laboratory space and treatment areas.

Splyce Interior Design has clearly demonstrated the evolution of a run-of-the-mill dental clinic, into a peaceful and specialized setting. Dentist trips are no longer dreadful, but manageable thanks to them. Our goal is to integrate meaningful design into the space we create. Every element in the space we create is placed to achieve something significant, as is the case with Same Day Dental Clinic. Watch this space for further prodigious design inputs by Splyce ID.

Splyce Interior Design LLC
Unit 124, 3rd floor
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Dubai, UAE
T: +971 4 3806560

Splyce Interior Design is a boutique agency driven to meet satisfactions of a clientele that know the value of good design and incorporated that into their own philosophy. Splyce believes its raison d’être is creating stunning designs that exceeded client expectations.
Treating the tooth, not the patient

Scott L. Doyle, DDS

Preservation of the natural dentition is the primary goal of dentistry. Published surveys indicate that patients generally value preservation of their natural teeth and have a strong desire to save their natural dentition in favor of extraction whenever possible. Significant technological and biologic improvements have been made in the past decades, making long-term retention of natural teeth more attainable. Patients still often prefer to avoid extraction and maintain their natural dentition, even when doing so may mean sacrificing esthetic and function of the remaining teeth.

A key focus of the Joint Symposium involved treatment planning decisions regarding endodontic treatment and implant therapy. Should a tooth with symptomatic apical periodontitis be re-treated with root canal treatment and restored with a crown, or should it be replaced with an implant-supported restoration? Whether or not to diagnose and manage apical periodontitis is critical in determining the tooth’s survival rate. The assessment of different treatment options including extraction and implant therapy must take into account the patient’s desires and needs, including factors such as longevity and function, cost, and consideration of the patient’s oral health.

Table 1: Survival rates following initial nonsurgical root canal treatment.

<table>
<thead>
<tr>
<th>Authors</th>
<th>Number of Teeth</th>
<th>Follow-up (years)</th>
<th>Survival (percent)</th>
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<td>Salvia et al. (34)</td>
<td>1050</td>
<td>8</td>
<td>97</td>
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<tr>
<td>Kois et al. (35)</td>
<td>540</td>
<td>7</td>
<td>97</td>
</tr>
<tr>
<td>Lacoratia et al. (36)</td>
<td>46,813</td>
<td>3.5</td>
<td>94.4</td>
</tr>
</tbody>
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For complex cases, referral to an endodontist with additional training and expertise may result in more favorable outcomes and decreased treatment times. Interdisciplinary care is important for the management of endodontic therapy.

Fig. 1. Three-year recall image. The patient has benefited from both root canal treatment and implant therapy. Courtesy of Dr. Tyler Peterson and the University of Minnesota School of Dentistry.

Fig. 2. Two-year recall image reveals both excellent and timely apical healing. Courtesy of Dr. Joe Petronia.

Fig. 3. A matched-case comparison of survival rates after treatment with either root canal treatment or extraction. (n=196) or a restored single-tooth implant (n=196) performed at the same institution. J Endod 2006;31. 26

Fig. 4. Pre-op image of tooth #19 with pulp necrosis and symptomatic apical periodontitis. A dentist initially recommended extraction and replacement of this tooth with an implant. The patient requested a second opinion from an endodontist who determined the tooth to be treatable.

Fig. 5. Four-year recall image demonstrates apical healing following nonsurgical root canal treatment. Accurate diagnosis prevented the unnecessary treatment of tooth #19. Courtesy of Dr. Martins Rogers.

Fig. 6. Two-year recall image demonstrates excellent endodontic treatment and healing of apical periodontitis. Courtesy of Dr. Deb Knapp.

Fig. 7. A recent systematic review published in the Journal of the American Dental Association highlights a key point: namely, that the survival rate of dental implants is comparable to that of periodontally compromised natural teeth. That is an important message: Periodontally compromised natural teeth are no exception to the rule that high levels of tooth retention and clinical care and prompt restorative treatment (Figs. 3 & 4).

Advancements in technology in maintaining high levels of tooth retention and clinical care and prompt restorative treatment (Figs. 3 & 4) advancements in technology in maintaining high levels of tooth retention and clinical care and prompt restorative treatment. The dental operating microscope, nickel-titanium instruments, apex locators, enhanced irrigation protocols and dentin preservation strategies are examples of improvements that allow clinicians to potentially manage a greater range of treatment options. Additionally, cone-beam computed tomography facilitates more accurate diagnosis and improved decision-making when managing the endodontic problems.

Comparative studies: Endodontically treated teeth and single-tooth implants

Large-scale systematic reviews have addressed the relative survival rates of endodontically treated teeth and single-tooth implants. The Academy of Osseointegration conducted a meta-analysis using 13 studies (approximately 5,000 teeth) treated endodontically and compared the outcome of teeth after extraction with the outcome of endodontically treated teeth and 17 studies (approximately 25,000 implants) on single-tooth implants. The outcome data demonstrated no significant differences between the two groups during any of the observation periods. Another systematic review supported the findings of the Academy of Osseointegration Comparison between the outcome of endodontically treated teeth with those of a single-tooth implant restored crowns, fixed partial dentures and single-tooth implants. At 97 percent, the long-term survival rate was essentially the same for teeth after extraction with the outcome of endodontically treated teeth with those of a single-tooth implant restored crowns, fixed partial dentures and single-tooth implants. At 97 percent, the long-term survival rate was essentially the same for teeth after extraction with the outcomes. Both options were superior to extraction and replacement of the missing tooth with a fixed partial

Fig. 8. Pre-op image of tooth #39 with pulp necrosis and apical abscess.

Fig. 9. Four-year recall image demonstrates apical healing following nonsurgical root canal treatment. Accurate diagnosis prevented the unnecessary treatment of tooth #39. Courtesy of Dr. Martins Rogers.

Fig. 10. Two-year recall image demonstrates excellent endodontic treatment and healing of apical periodontitis. Courtesy of Dr. Deb Knapp.

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Fig. 12. Two-year recall image reveals both excellent and timely apical healing. Courtesy of Dr. Joe Petronia.

Fig. 13. Three-year recall image. The patient has benefited from both root canal treatment and implant therapy. Courtesy of Dr. Tyler Peterson and the University of Minnesota School of Dentistry.

Fig. 14. Two-year recall image demonstrates excellent endodontic treatment and healing of apical periodontitis. Courtesy of Dr. Deb Knapp.

Fig. 15. Four-year recall image demonstrates apical healing following nonsurgical root canal treatment. Accurate diagnosis prevented the unnecessary treatment of tooth #19. Courtesy of Dr. Martins Rogers.

Fig. 16. Three-year recall image. The patient has benefited from both root canal treatment and implant therapy. Courtesy of Dr. Tyler Peterson and the University of Minnesota School of Dentistry.

Fig. 17. Two-year recall image reveals both excellent and timely apical healing. Courtesy of Dr. Joe Petronia.

Fig. 18. Pre-op image of tooth #29 with pulp necrosis and symptomatic apical periodontitis. A dentist initially recommended extraction and replacement of this tooth with an implant. The patient requested a second opinion from an endodontist who determined the tooth to be treatable.

Fig. 19. Four-year recall image demonstrates apical healing following nonsurgical root canal treatment. Accurate diagnosis prevented the unnecessary treatment of tooth #31. Courtesy of Dr. Martins Rogers.

Fig. 20. A matched-case comparison of survival rates after treatment with either root canal treatment or extraction. (n=196) or a restored single-tooth implant (n=196) performed at the same institution. J Endod 2006;31.
Patients and living longer; therefore, preservation of the natural dentition is more important than ever. Helping patients maintain their “Teeth for a Lifetime” is the fundamental goal of dentistry and often aligns with the desires of the patient. A wide range of endodontic procedures result in a high level of tooth retention and patient satisfaction. Large-scale studies provide strong support that the restored endodontically treated tooth offers a highly predictable, long-term approach to preserving “nature’s implant” — a tooth with an intact periodontal ligament.

Thus, excellent endodontic treatment followed by an immediate restoration of equal or better quality can give patients service and function while maintaining their esthetics for many years. Studies indicate that the high survival rates achieved with root canal treatment are comparable to those reported for the restored single-tooth implant.

Therefore, clinicians must consider additional factors when making treatment planning decisions, all of which must be in the best interest of the patient. Endodontic treatment and implant therapy should not be viewed as competing alternatives, rather as complementary treatment options which can provide the appropriate patient situation.


A complete list of references is available from the publisher, and also at www.aae.org/conferences.

Case report contributed by Dr. Robert S. Roda.

**Case report**

A case report (Figs. 7a–h) demonstrates an alternative treatment option for a patient to save a natural tooth. A 79-year-old female patient presented to an endodontist’s office with a complaint of persistent pain to tooth #31. Tooth #31 had a history of root canal treatment and coronal restorations. The previous root canal treatment including CBCT, led to the diagnosis of previously treated tooth #31 with symptomatic apical periodontitis. A detailed explanation of the risks and benefits associated with all treatment options was presented. The patient expressed a strong desire to save her tooth and consented to intentional replantation. Tooth #31 was anatomically prepared and filled with mineralized bone graft. No complications were encountered during the intentional replantation. The root end was sealed, radiographically and toluidine blue positive.

**Ethics and interdisciplinary consultation**

Clinicians are ethically bound to inform patients of all reasonable treatment options, explain the risks and benefits associated with each, and provide all available treatment options, and obtain informed consent before initiating treatment. This recommendation was conveyed in an impartial manner. Patients value participation in treatment planning and should be encouraged to exercise autonomy by communicating their preferences. Clinical treatment desicions regarding either endodontic treatment or tooth extraction with implant therapy should always be made in the best interest of the patient using the best, most current evidence.

Should it be necessary, experts from the dental team may need to be called upon to assist the clinician in rendering the highest quality of care (Figs. 4a, b). The standard of care must be applied equally to all clinicians, generalists and specialists alike. The AAE’s Endodontic Case Efficacy Assessment Form and Guide to help the clinician in case selection and determining whether to treat or refer patients are of the best possible outcome for each case.

Interdisciplinary communication and collaboration during treatment planning maximize this likelihood. Specialists and restorative dentists should be viewed as partners in the treatment planning team. Endodontists and periodontists are uniquely positioned to evaluate and treat the patient and should be well-versed in implant treatment planning to help the patient preserve valuable natural teeth, and referring colleagues in making an informed choice regarding all replacement options. If a tooth has a questionable prognosis, the endodontic specialist can play a vital role in part of the treatment planning team. The endodontist has experience with various replacement options for the appropriate patient situation.

**References**

1. Patients taking antiseizure or antipsychotic medications (e.g., benzodiazepines) may have an increased risk of developing a drug-induced osteonecrosis of the jaw. This may affect treatment planning for both implant and root canal therapies.

2. It is generally recommended to wait for the completion of dental and periodontal procedures before implant placement.

3. Centrally located teeth are more likely to result in a high level of tooth retention and more patient satisfaction. Large-scale studies provide strong support that the restored endodontically treated tooth offers a highly predictable, long-term approach to preserving “nature’s implant” — a tooth with an intact periodontal ligament.

4. Therefore, clinicians must consider additional factors when making treatment planning decisions, all of which must be in the best interest of the patient. Endodontic treatment and implant therapy should not be viewed as competing alternatives, rather as complementary treatment options which can provide the appropriate patient situation.

**Conclusion**

Patients are living longer; therefore, preservation of the natural dentition is more important than ever. Helping patients maintain their “Teeth for a Lifetime” is the fundamental goal of dentistry and often aligns with the desires of the patient. A wide range of endodontic procedures result in a high level of tooth retention and patient satisfaction. Large-scale studies provide strong support that the restored endodontically treated tooth offers a highly predictable, long-term approach to preserving “nature’s implant” — a tooth with an intact periodontal ligament. Thus, excellent endodontic treatment followed by an immediate restoration of equal or better quality can give patients service and function while maintaining their esthetics for many years. Studies indicate that the high survival rates achieved with root canal treatment are comparable to those reported for the restored single-tooth implant.

Therefore, clinicians must consider additional factors when making treatment planning decisions, all of which must be in the best interest of the patient. Endodontic treatment and implant therapy should not be viewed as competing alternatives, rather as complementary treatment options which can provide the appropriate patient situation.


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Case report contributed by Dr. Robert S. Roda.
Resin bonding of the human dentition has become a “standard” in the United States and Canada. There are more than 80 different bonding systems on the market today. We have seen them evolve through multiple generations in an attempt to “simplify” the bonding process. Yet, as these agents have simplified, many in our profession have seen many challenges arise.

A significant number of reports in the literature have been showing that the “immediate bonding” effectiveness of contemporary adhesives is quite favorable, regardless of the approach used (however) in the long term, the bonding effectiveness of some adhesives drops dramatically.1-5 The hydrophillicity that both etch-and-rinse and self-etch bonding agents offer initially in the dentin bonding process becomes a significant disadvantage in terms of long-term durability.6

It is this hydrophillicity of simplified adhesive systems combined with other operator-induced challenges that contribute to these failures.7 Tay, Carvalho, Passley, et al. have reported repeatedly in the literature of this problem.8 They continue to report that these bonding agents do not coagulate the plasma proteins in the dentinal fluid enough to reduce this permeability. The fluid droplets contribute to the incompatibility of these simplified adhesives and dual-cure/composites in direct restorations and the use of resin cements for luting of indirect restorations. The term “water-tree” formation has been coined to describe this process, which originated from the tree-like deterioration patterns that were found within polyethylene in solution of underground electrical cables. It is now being applied to the water blisters formed by the transfer of dentinal fluid across the dentin bonding interface. These “water blisters” act as stress raisers and form initial flaws that cause subsequent catastrophic failure along the adhesive composite interface.9

The previously mentioned plasma proteins are released by the dentin when subjected to acids and cause hydrolytic and enzymatic breakdown of the dentin and resin bonding agent interface.10 These enzymes are called matrix metalloproteinases (MMPs).

Currently, there are only three methods of reducing these MMPs: 1 percent chlorhexidine solutions that are used prior to application of bonding agents; etchants containing benzoquinone chloride, otherwise known as RBC (e.g., Risco’s Uni-etch products); and polyvinylphosphonic acid-modified glass ionomer and resin-modified glass ionomers.11 Due to the short efficacy of these chlorhexidine solutions being used before bonding, this methodology has come into question as of late.10 Etchants with RBC have been shown to be valuable in the reduction of MMPs and should be considered in all bonding procedures.12 However, the most intriguing methodology of reducing MMPs and remineralizing tooth structure is with the use of glass ionomer cements (GIC) and resin-modified glass ionomers (RMGIC).

**Glass ionomers and resin-modified glass ionomers**

Glass ionomer cements have long been used as a direct restorative material. Their early formulations made the material difficult to handle, and they were soon replaced by a multitude of other materials in an unsuccessful attempt to provide an adequate substitute.13 However, glass ionomer cements, with their ability to renew broken bonds and provide flexibility during function, have been shown to undergo slight polymerization of two different light activated materials that involves “the sequential layering of GIC, RMGIC and composite resin prior to photo-polymerization and beading” of these materials). In addition, these ionomers have better internal adaption and resistance to microleakage over extended periods of time, have no free monomers, can be bulk filled and offer excellent biocompatibility.14

Another important consideration is that glass ionomers act as demineralizing materials, which makes them very sensitive for use in the intraradicular cavity. The transfer of dentinal fluid from the tooth to the GIC essentially creates a “sandwich” of glass ionomer based materials. It serves to defl ect or blunt any cracks that attempt to propagate through the matrix and plays an adjunctive role by obliterating porosities which delay the growth of inherent cracks in the GIC under loading.15

The intermediate layer of the GIC provides durability during function and loading and acts as a stress absorber at the interface of the restoration and the tooth.16

Resin-modified glass ionomers (RMGIC) are a hybrid of traditional glass ionomer cements with a small addition of light-curing resin, exhibit properties intermediate of the two materials.17 This material has been shown to have properties similar to GIC, but with better esthetics and immediate light cure. RMGICs have been shown to undergo slight internal fracturing from polymerization shrinkage, yet have an inherent ability to renew broken bonds and reshape to enforce new forms.14

Application of RMGIC to all cut dentin in Class II composite restorations has been shown to “significantly reduce micro-leakage along (the) axial wall of the restoration” and helps prevent bacterial invasion of the restored root. RMGIC biomaterials are multifunctional molecules that can adhere to both tooth structure and composite resin, thus providing an improved sealing ability by chemical or micromechanical adhesion to enamel, dentin, cementum and composite resin.18

And like GICs, can be bulk filled to reduce the amount of composite necessary to restore the cavity preparation and act as a stress substitutes in the restoration.19

The use of GIC and RMGIC in the restoration of posterior Class V restorations and conservative Class I restorations provides additional benefits.20 They are easy to place and reasonably forgiving, even in a slightly moist environment. They polymerize slow in a moist but not wet environment, so familiarity with technique is imperative as it is with all dental restorations.

I will often use Riva SC (Gaul) or Fuji 9.
boding agent because the bonding agent is essentially the RMGIC. The RMGIC acts as the interface between the tooth surface and the filling material. It combines the GIC and RMGIC in a way to form what can best be described as a “monolithic biomimetic restoration.” This is an “open sandwich” type of sandwich technique. That is, the GIC component is exposed to the oral environment (Fig. 13) at the gingival portion of the restoration. It is quickly and efficiently accomplished and has significantly reduced the time in coalescence of the three materials. The restoration is then cured for 30 to 40 seconds with an LED curing light that generates at least 1,500 mW/cm². Appropriate light output is critical for all direct cured restora-
tions, and assurance that adequate light output is provided by the curing light is needed for complete cure of any direct restoration.

The restoration is evaluated for com-
ture and then a layer of an un-
filled resin is added onto the exposed GIC/RMGIC/composite complex and cured for an additional 20 sec-
onds. The matrix band is removed and the restoration is trimmed and polished as usual. Any typical RBC restoration would be:

1. Have found that an entire three-
surface posterior restoration can be accomplished in less than three minutes once the matrix has been placed. Typically, finishing the restora-
tion can also be done in less than three minutes. This makes the direct posterior restoration quite efficient and beneficial to the clinician and the patient because it provides a restoration that will help ancora the healing of the dentin and reduce recurrent decay and restorative failure.

Nanotechnology in dental materials

This new type of technology involves the pro-
duction of functional materials and structures in the range of 0.1 to 100 nanometers by some combination of physical or chemical methods. Today, the development of nanotechnology has become one of the most highly energized disciplines in science and technology because it can stimulate the creation of new bonding agents with properties previously unimagined applications of nanomaterials.

Several studies24−26 have shown that the inclusion of these types of nano-
fillers and nano-fibers into the dental materials (dentifinposites and bonding agents) can improve the physical properties by increasing the strength, polishability, wear resist-
ance, esthetics and bond strength in many dental applications. It is also envisioned that the incor-
poration and utilization of these na-
noparticles in the form of nanorods, nanotubes, nanowires, nanospheres and ormosics (organically modified ceramics) into dental restorative and bonding biomaterials will further enhance the bi-
omimetic (life-like) restorations. This will not only enable these materials to mimic the natural structure and esthetics of the tooth structure, but will also be able to facilitate the remineralization of that structure.

As Saunders states in his conclusion, “such nanoresinbased biomaterials could very credibly be the next trans-
formative clinical leap” in restorative dentistry.

Gioner et al.27 in their paper, an exciting advance-
ment in bioactive materials is the development of gioner products (Shofu Dental, Beaurill II, and Beau-
trill Flow Plus). These products are resin-based com-
posites that contain pre-mixed glass ionomer particles (8−10μ).

These particles are made of fluo-
silicate glass reacted with polyacrylic acid (just like a GIC) just before being incorporated into the resin. This cre-
ates a new type of bioactive material that is different from the traditional types of bioac-
pactive materials in a similar manner to GIC. They release ions and recharge with the acid phase formation and neutralize and buffer the acids of the mouth (Fig. 14). No other composite material has this property to date. I use these gioners instead of traditional nano-hybrid compo-
sites in my restorations because of these properties. They complete the entire biomimetic and bioactive nature of all the co-cure products that I create.

The Beautrill Flow Plus product line has also expanded the way that I can cre-
ate restorations due to their unique viscosities. These materials can be cre-
ated and shaped (Fig. 15) and used in a restora-
tive process I call the “modified resin composite technique” (Fig. 16).

They can also be applied to create direct composite veneers that can be easily placed, sculpted and highly polished (Fig. 17). Easy placement, the ability to maintain position and shape, plus their bioac-

tive nature, make these materials a “game-changer.”

Resin-modified, light-cured bonding agents

Another advancement that I have been working with is a product that is a resin-modified, light cured bonding agent (SFI, North America; Rio Bond LC). This product is a specially formulated liquid RMGIC that can be used to bond composite restora-
tions in the traditional sense; used in traditional sandwich and modified sandwich techniques and, of course, used in the Co-Cure Technique. This concept is especially appealing in light of the research that indicates RMGICs provide quite good margin-
al seal when used as a bonding agent on cut dentin surfaces.1−3 I especially like to use it with the Co-Cure Tech-

nique and when doing anterior restorations. Using this technique I am able to get a completely biomimetic bioactive restoration in both situa-
tions because of the bioactive nature of the materials used.

The technique for use of this RMGIC agent with composite is as follows:

1. Etch with 37 percent phosphoric acid
2. Wash and dry but do not desiccate
3. Truature and apply the RMGIC (Bond LC). This product is a specially formulated liquid RMGIC that can be easily placed, sculpted and highly polished (Fig. 17).
4. Place composite to fill the preparation and cure for 20 seconds.
5. Face composite to fill the prepara-
tion and cure as appropriate.

When I use this material in the Co-
Cure Technique I just substitute it for the traditional RMGIC material that I would have used otherwise.

Resin-modified calcium sili-
cates

Another recent interesting product release is from Bisco and is called TheraCal²™. This light cured calcium based material is used to seal and protect the dentin-pulp complex. It is the first of a new class of internal dentin pulpal protective materials known as resinmodified calcium silicates (RMCS). It acts as a pulp capping and liner material. Calcium hydroxide (CH) has been the ‘gold standard’ for over 100 years. However, it has always had difficulties in following as a LIR adhesives. In fact, despite their frequent use, the success of CH based therapies is only 30 to 50 percent.21

It has also been shown that tradi-
tional resinbonded light-cured liners have been cytotoxic to cultured od-
sontoblast-like cells, while light cured resinbased MTA cement possessed the lowest cytotoxic effects.22 Based on this, the clinical evidence that RMCS is a logical step in developing a solution for direct pulp protection. Calcium has been shown to be cru-

eal to the formation of apatite, den-
in formation and regenerative potential of affected dentin. Addi-
tionally, alkalinity also seems to be contributory toward this goal. This combina-
tion in the RMCS material appears to form good, hard and thick dentin bridges and stimulates den-
in pulp cells to turn into odontoblast
dentin cells.23

This type of material represents a promising new direction in direct pulp-capping clinical procedures with its ability to form apatite and further contribute to the formation of new dentin.

Conclusion

It is my belief that using bioactive materials in the provision of care for my patients has contributed significantly to the success of the care I have been providing in this way. I have pro-
vided ways to help the dentinal tissue to enhance the restoration and improve the health of my patients. I believe we are on the threshold of further bioactive material advance-
ment and that learning and incor-
porating these materials into the day-to-day provision of care will continue to help us in our practices and our profession.

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The full list of references is available from the publisher.
FDI expert conference: Oral health for ageing populations

By DTI

LUCERNE, Switzerland: From 3 to 5 May, the FDI World Dental Federa-
tion held a three-day conference on Oral Health for Ageing Populations
(OHAP) in Lucerne. The invite-only conference focused on the theme of
"Life-long oral health: A fundamental human right". A total of 20 ex-
erts from around the globe, includ-
ing the World Health Organization
(WHO), gathered to discuss strategies
to address the growing burden of
dental disease and prevent tooth loss in
elderly populations.

After the World Congress in March
2015, themed "Dental care and oral
health for healthy longevity in an
aging society", which was held by
WHO and the Japan Dental Asso-
ciation in Tokyo in Japan, the OHAP
initiative was launched by the FDI in
2015, themed "Dental care and oral
disease and prevent tooth loss in
elderly populations.

At the meeting, FDI President Dr
Patrick Hescot stated, "It is a great
achievement that populations are
living longer thanks to advances
made in the fields of medicine, tech-
ology, public health and policy. But
it is our role as dentists to ensure that
people not only live longer lives but
healthier ones too, free of oral dis-
ease, which plays a fundamental role
in securing a person’s overall health
and wellbeing. Oral health is often
a neglected area of healthy ageing,
which is why this conference is so
important to try and reset the bal-
ance."

Dr Beat Wäckerle, President of the
Swiss Dental Association and local
conference host added, "Avoiding
tooth loss is crucial for healthy age-
ing. Yet, the complete loss of natu-
ral teeth is highly prevalent among
people not all over the world, with
severe dental caries and advanced
periodontal disease being the major
causes. We must take urgent action
and put preventative strategies in
place."

Although tooth loss is declining in
many high-income countries, and
older people are increasingly pre-
serving their teeth in a functional
manner, the latest figures from
WHO indicate that the prevalence of
dental disease is increasing in low-
and middle-income countries. Most oral
diseases and conditions require pro-

fessional dental care; however, ow-
ing to limited availability or inacces-
sibility, the use of oral health services
is markedly low among older people.

GC Chairman Makoto Nakao high-
lighted, "In countries like Japan,
30 per cent of the population are
already over 60 years old, it is now
low- and middle-income countries
that are experiencing the biggest
change and GC is committed to
working with FDI and through its
network of more than 200 national
dental associations to address this is-

sue on a global level and affect posi-
tive change for the millions of peo-
ple suffering unnecessarily from oral
disease, when they could be enjoying
active healthy ageing."

Outcomes from the recent meeting
in Lucerne will be presented at the
FDI Annual World Dental Congress,
which will take place in Poznan in
Poland from 7 to 10 September. In ad-
dition, strategies on combating oral
disease in ageing populations will be
launched at the event.

According to the Global Burden of
Disease Study, oral disease affects
9 billion people worldwide and un-
treated dental caries affects almost
half of the world’s population (44 per
cent), making it the most prevalent
of all the 291 conditions investigated
in the study.

Poor dental health can affect both
psychological and physiological
health, leading to a significantly
reduced quality of life. In addition
to functional problems, poor oral
health and dental problems can re-
sult in inflammation of the gingiva
and a poor-quality monosodium diet,
all of which increase the risk of mal-
nutrition. The FDI stressed that this
problem will only worsen if urgent
action is not taken. WHO estimates
that the proportion of the world’s
population over the age of 60 will
nearly double from 12 to 22 per cent
between 2015 and 2050.

NEW Interdental brushes with WaveCut™
bristle technology for better cleaning

From left: Dr Hiroshi Ogawa (WHO), Dr Patrick Hescot (FDI), Dr Beat Wäckerle (Swiss Dental Association), Makoto
Nakao (GC) (Photograph: Gilberto Lantto/FDI)

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in...
Daily cleaning between your teeth matters

By Jordan

Effective removal of interproximal plaque is not achieved by a toothbrush alone. Dentists recommend that you floss daily, but very few people do this on a regular basis. Interdental brushes can be an attractive alternative to flossing and are a proven effective tool for reducing interproximal plaque. There are a number of different factors that need to be considered when choosing the right interdental brush, for example size, shape, the user’s manual dexterity and motivational level.

The smallest size is best for those users who have healthy gums and small interproximal spaces. This is generally a good alternative for first time users. Daily use of an interdental brush gives results, especially in comparison to simply brushing. Studies show that most of us (up to 90%) will experience some form of mild gum disease (gingivitis). Early symptoms of gum disease can be detected by inflamed gum tissue. This is caused by the bacteria in dental plaque. If the bacteria is not brushed away, it may form tartar and can eventually result in a cavity. As many as 30% of cavities are between our teeth. Studies have found that the ease of use of a product does affect one’s motivation. The majority of the test study individuals preferred using interdental brushes to floss. They found them simpler to handle, using only one hand, and felt that interdental brushes were more time efficient.

The advice is to look for an interdental brush that has a sturdy but compact handle so that the users get a good and comfortable grip. Shorter handles give the user more control as the position of the thumb/ﬁnger grip is closer to the point of contact. A non-slip grip also helps controlled movement. It is important that the user is able to navigate easily in the mouth, reaching the back molars.

We found the highest usage of interdental brushes among consumers between the ages of 40-49. 6 out of 10 of these use interdental brushes on average 3-7 times a week.

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**Interview: “The future of dentistry is digital and focused on prevention”**

An interview with Ueli Breitschmid, CEO of Curaden

By Marc Chalupsky, DTI

Swiss dental company Curaden is one of the few businesses in the industry that adopt a holistic approach to dentistry. The company combines high-quality dental care products, pioneering training systems and prophylaxis concepts for long-term oral health. In this interview, CEO Ueli Breitschmid talks about new ways and knowledge in dentistry and optimum preventive care as key to good oral health.

Dental Tribune: Mr Breitschmid, Curaden allows access to more than just dental care products. You advocate comprehensive training in the field of dental prevention. Why is this issue so important?

Ueli Breitschmid: Curaden is the only company that, in addition to manufacturing products, provides patients with the necessary knowledge and skills, in cooperation with trained instructors, to take control of their oral health themselves. We have developed our knowledge and products with the aim of teeth remaining healthy for a lifetime. Our corporate philosophy combines the innovative CURAPROX products, our dental education system iTOP and the practical Prevention-One plan. Our goal is to reduce the prevalence of gingivitis, periodontitis and tooth loss. Therefore, we support comprehensive soft-tissue prophylaxis. Finally, they are still the most common cause of poor oral health. We support prophylaxis to this end, with our great interdental toothbrushes, our iTOP seminars and other services.

In any oral health discussion, it is always important to look at the combination of a high-quality product and the training and knowledge in dentistry and oral health. We support prophylaxis to this end, with our great interdental toothbrushes, our iTOP seminars and other services.

How can control and continued motivation be achieved?

Patients and dentists should follow a regular schedule concerning both treatment and training. Today’s approach of one or two dental visits per year is not adequate for patients and dental professionals. We focus on optimal prophylaxis for patients and dental professionals. Individually trained oral prevention (iTOP) is our internationally well-known educational system. For this purpose, we have been working together with established dentist Dr Jiri Sedlmayer. He has revolutionised the approach to teaching, motivation and control of individual prophylaxis for long-term dental health. This approach includes regular training, the proper tools and a good dose of motivation. First, we begin with the dental professionals, who pass their new knowledge and skills directly to patients. All our iTOP seminars are supervised by independent dentists and dental hygienists who have completed the training themselves.

iTOP addresses one of the major issues in every dental practice: how to motivate and instruct patients to brush their teeth properly. People are not as motivated to brush their teeth as they should be, but it is important to help them create a good habit.

How long is the iTOP programme?

The iTOP programme is structured consecutively. We offer multi-day seminars for both beginners and advanced practitioners, as well as for prospective iTOP trainers. Our recall seminars enhance knowledge and provide additional motivation. iTOP also teaches communication strategies. Communication with the patient and with the team are key to dental health. A further advantage of iTOP is the global coverage of our educational programme. Whether in Europe, in Asia or in North America, dental staff can benefit from the comprehensive solutions of our iTOP training.

I would like to recommend our iTOP workshop on 23 June in Basel in Switzerland to all dental hygienists. This is being held as part of the Symposium on Dental Hygiene. We have invited top speakers from Ireland, South Africa, Canada and Switzerland to talk about their experiences with iTOP in their respective fields and how it has helped them to achieve sustainable oral health in their patients.

With iTOP for students, Curaden is targeting young denists and young dentists. Why does Curaden place so much importance on the early training of students?

First, students should maintain their teeth for a long time and only then can they treat their patients. The dentist and patient should always have the regular care of their own teeth with good toothbrushes, toothpastes and interdental brushes. The aim of the emerging dentist to become familiar with how to treat the damage to be repaired properly. Early on, we convey the principle of touch—to the proof is in the pudding.

How can dental professionals better apply your iTOP concept for the benefit of the patient and practice? We offer them a financially attractive service package for the long-term dental health of their patients, called Prevention-One. Prevention-One is our innovative treatment approach to prophylaxis services. The plan includes comprehensive training and dental procedures, as well as CURAPROX products. We believe strongly in the power of iTOP seminars to influence the future of dentistry.

No matter the product, whether Prevention-One or CURAPROX, we want to be accessible to patients. In 2015, we founded the first Curaden clinic in the heart of London. The practice offers top facilities and, of course, all the products and concepts of Curaden.

Thank you very much for the interview.
Avulsion in Paediatric Dentistry: Management of a Double Dental Emergency in a Child

By Dr Ghada Hussain & Dr Iyad Hussein, UAE

**Introduction**
General dental practitioners and paediatric dentists face real dental emergencies that effect children, especially dental trauma. Avulsion is considered, in terms of severity, the worst of dento-alveolar injuries. This is when the tooth is completely displaced out of its socket and the socket is found empty or filled with a blood coagulum. We report a case that describes the management of an avulsed maxillary central incisor (21) in a fit and healthy 8-year-old boy, accompanied by a lower lip laceration. The management of 21 took place over a period of 12 months.

**Case Report**
An 8-year-old child presented to the department of paediatric dentistry at the Hamdan Bin Mohammed Col- lege of Dental Medicine (HBMCMD) at the Mohammed Bin Rashid University (MBRU) in Dubai Healthcare City. He allegedly fell off a climbing wall, and knocked out his upper left maxillary incisor (tooth # 21) and cut his lower lip (Figures 1 and 2). This occlusion involving the vermilion. There was no need for soft tissue radiographs as no tooth fragments were missing and the tooth was accounted for.

**Diagnostic summary**
- 21 avulsed with immature root.
- Concussion 12, 11, 22.
- Through-and-through lower lip laceration involving the vermilion.
- Inverted conical supernumerary/mesiodens.
- Behaviour: Mildly anxious at initial presentation, very cooperative through the treatment visit.

**Aims and objectives of treatment**
Management of acute traumatic injuries and replant the avulsed 21 through the treatment visit.

**Radiographic examination**
Periapical views of the upper maxillary incisors were obtained to rule out any root fractures (see Figures 4 a & b) revealed immature roots of teeth # 12, 11, 22, no root fractures and an inverted supernumerary apical to 11 and an empty socket of 21. There was no need for soft tissue radiographs as no tooth fragments were missing and the tooth was accounted for.

**Extra oral examination**
- No TMJ, alveolar or facial bone fractures detected.
- Lower lip through- and- through ragged laceration of the lower lip (Figure 1).
- Class 2 skeletal profile.

**Intraoral examination**
- 21 empty socket with coagulum.
- Laceration of the buccal gingiva near 21.
- Incisor relationship Class 2 Division 1 (6–7 mm). Mum informed us of her son having proclined incisors prior to the injury.

**Intraoral appearance following a second trauma incident that happened with- in 2 hours:**
Within two hours of leaving our clinic, the patient suffered another trauma affecting the injured area. This happened at the GMP receptionist’s office. As the receptionist was asking the patient’s mother where her son was, she pointed to him (he was standing behind her) and accidentally hit her mouth. There was no LOC, nausea, vomiting or disorientation. This caused the GMP concern so she sent the patient back to us for a reassessment. To our sur- prise, the patient showed up in our clinic (at 18:20 hours) with renewed bleeding from his mouth (Figure 10 a & b).

After obtaining a new history and carrying out an assessment, the wound was debried. The splint and sutures were examined and were found to be intact. Although the splint was slightly mobile (Grade 1), it was securely bonded to the teeth. No new radiographs were indicated. The patient and family were reassured and the above advice was reiterated. They went back to the GMP for the final stages of treatment.

**Treatment Plan**
After the patient’s initial assessment, we administered LA to his upper anterior sextant and lower lip. During this time, both the tooth and socket were gently irrigated with physiological saline. 21 was found to have an immature root and open apex. (Figures 5 a & b).

Within the hour, tooth 21 was gently replanted into the socket (Figure 6) and a flexible 0.035" wire/composite passive splint of teeth #12, 11, 22 was secured (Figure 7). We sutured the lacerated lower lip in multiple layers (musculo, deep and superficial) using Vicryl® (Sizes 4-0 and 6-0) resorbable fine sutures (Figure 8 and 9). This took place after thorough debridement of the wound with physiological saline. Care was taken to assure alignment of the lip’s vermilion involved in the laceration. The patient was advised to maintain a soft diet, and analgesics (Paracetamol 500mg PRN) and antibiotics (Amoxicillin 250mg TID for 5 days) were prescribed. Chlorexidine glu- conate 0.2% to milk BD mouth rinse was advised. After discussing the short and long- term consequences, a follow up appointment was arranged in 6 weeks, and the patient was discharged. We advised the patient to attend his general medical prac- titioner (GMP) to obtain a Tetanus booster injection straight after the appointment.

**A second trauma within two hours**
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**Figure 1:** Initial presentation. 21 was avulsed and its socket appeared empty. There was a lac- eration of the lower lip.

**Figure 2:** Palatal view of 21 socket. Notice the coagulum filled socket.

**Figure 3:** Storage medium of 21 was milk. The "wet time" was 50 minutes.

**Figure 4 (a & b):** Empy socket of 21 due to its avulsion. Notice the immature apices of 12, 11 and 22. In addition there was a supernumerary tooth/mesiodens.

**Figure 5 (a & b):** Avulsed 21 with open apex was irrigated with saline as soon as the patient arrived to the clinic. Notice the tooth was held without touching the root to preserve the PDL tissue.

**Figure 6:** Tooth 21 was replanted gently into the socket after giving LA. This took place 60 min- utes after the injury.

**Figure 7:** A passive composite and wire splint involved #12 to 22. The lip was yet unsutured.
Figure 11: A periodontal radiograph taken one week post-op showed the correct positioning of the replanted tooth. Note the open apex.

Figure 12: Healing of the lip one month post-op. Some oedema and scarring were noted.

Figure 13: One-month post-op after removal of the splint. The tooth was responsive to EC & EPT.

Figure 14: One year follow up. The patient and parent were pleased with the aesthetic result. 21 was vital and positively responsive to EC & EPT. The tooth was non mobile and produced a metallic sound indicative of ankylosis.

Trauma follow-up appointment (one-week post op)
The aim of the visit was to review 12, 11, 21, 22 and to assess soft tissue healing. The patient had no complaint whatsoever. Observations revealed a slight mobility of 21 and good healing lower lip and buccal gingiva of 21 with good oral hygiene but some visible plaque on 22. The splint was intact. We obtained a periapical radiograph of 21, which showed it to be in a favourable position (see Figure 11) with a large wide-open apex.

At this appointment, and in the subsequent appointments (3, 5, 6, 9 and 12 months post-op) we completed a ‘Dental Trauma Stamp’ (see Table 1 for an example) which included assessment for mobility, tooth colour (direct and transillumination), tenderness to percussion (TTP), sinus presence, swelling presence, percussion sound, electric pulp tester (EPT), ethyl chloride (EC) and radiographic assessment. The latter was essential to assess for apical pathology, root resorption (internal and external), arrested/continued root development, pulp obliteration and replacement resorption/ankylosis. The dental trauma stamp was repeated at every visit. It helps in assessing periodontal ligament (PDL) and pulpal healing.

Trauma follow-up appointment (one-month post op)
The healing of the lip appeared satisfactory (Figure 12). We gently removed the dental splint (Figure 13) and a new dental trauma stamp was completed. Tooth 21 was +ve to EC & EPT suggesting possible revascularization, although this was not absolute.

Subsequent appointments
At 3, 6, 9 and 12 months post op)
Healing of the lip and periodontal soft tissues continued satisfactorily and the patient and mother were happy with the aesthetically pleasing result (see Figures 14, 15 & 16). A mouth guard was made to prevent further dental injuries to the same area. Dental care was treated appropriately.

However the dental trauma stamp revealed that tooth 21, despite remaining vital (+ve to EC and EPT), non-discoloured and asymptomatic, became ankylosed. At 3 months a decision whether to initiate root canal treatment or not was debated, but no intervention was decided upon, as the tests suggested its vitality. The tooth was non-mobile and was producing a ‘crack plate metallic’ sound on percussion. At 6 months, radiographically, there was evidence of replacement resorption (Figure 17a, b & c). This worsened at 12 months. This tooth will inevitably be lost.

Discussion
Traumatic dental injuries are common, with between 6-34% of children aged 8-15 experiencing damage to their permanent teeth. Over 75% of all traumatic oral injuries occur in childhood, and in the United Kingdom, the proportion of 12 and 15 year olds with any traumatic damage was recently found to be 12% and 10% respectively. Traumatised teeth can have a significant clinical, aesthetic and social impact on the child as an individual. Treatment of traumatised teeth usually requires extensive management, carrying a burden for the patient as well carers and health authorities in the long term. Avulsion is the complete displacement of tooth out of its socket and the socket is found empty or filled with a blood coagulum. Avulsion accounts for between 0.5 to 9% of dento-alveolar trauma to permanent teeth. About 90% of replanted avulsed teeth will undergo ankylosis.

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According to British Society of Paediatric Dentistry (BSPD) guidelines, factors to take into account when stored in appropriate storage medium, replantation without dissection is limited evidence regarding the treatment of trauma with the associated soft tissue injury and contamination, an antibiotic was prescribed as per International Association of Dental Trauma (IADT) guidelines. The GMP guidelines recommend the use of EPT and EC tests, no other sign of internal inflammatory or root resorption. The lip healed favourably. The patient and his parents were warned about the poor long-term prognosis of 21 and alternative long-term treatment options were discussed.

Summary and conclusion
21 was avulsed with a lip laceration. The tooth was replanted, splinted and the lip was sutured. The tooth suffered another trauma after two hours. Radiographic findings showed signs of replantation resorption from 6 months post trauma. Clinically, 21 responded positively to EPT and EC tests; no other signs of inflammation. Deoronation (removal of the crown and retention of the root with surgical coverage) will be implemented. The lip healed favourably. The patient had an impact on the reduction of its prognosis. The tooth was carefully monitored to assess pulp regeneration or necrosis. The tooth remained vital, however, it underwent ankylosis. Therefore, its prognosis was deemed poor, and its long-term treatment plan and future considerations
Tooth 21 future treatment options available will:
- Decompression removal of the crown and retention of the root
- Extraction and partial removable denture
- Extraction and resin bonded bridge
- Auto-implantation of a premolar (if crowding occurs)
- Osteo-integrated implant (after the age of 18 years)

As he was a very active boy and loves playing football, and due to his dental history where he had a repeated history of trauma in the same tooth, in addition to his Class 2 Division 1 malocclusion with an overjet of 10mm, a custom fit mouth guard was fabricated to be worn while engaging in any contact sports. Overjet correction will be needed. The patient was referred for an orthodontic and motivational opinion for planning of multidisciplinary treatment options.

References

EFP societies celebrate biggest-ever European Day of Periodontology

By DTI

MADRID, Spain: For the third time, the European Federation of Periodontology (EFP) celebrated the European Day of Periodontology on 12 May. The event has grown immensely from its launch in 2014, with 20 national societies of periodontology across Europe taking part this year. The EFP-affiliated bodies organised a wide range of activities, including television and radio interviews, awareness actions in public spaces, and tongue examination sessions at universities and dental surgeries.

With this year’s slogan, “Healthy gums for a better life”, the EFP and its affiliated societies aimed to raise awareness of gingival disease and its links to other diseases, such as diabetes and cardiovascular disease. In order to support this goal, the EFP launched a media campaign, including posters, press releases, images and a new visual identity, also providing its members with information material for the event.

According to the EFP, at least 20 national societies joined yesterday’s celebration by organising numerous events across Europe. The countries that took part were Austria, Azerbaijan, Belgium, Croatia, Finland, France, Germany, Greece, Ireland, Israel, Italy, Lithuania, the Netherlands, Portugal, Romania, Spain, Switzerland, Turkey, Ukraine and the UK.

The Belgian Society of Periodontology invited all dentists in the country to dedicate 12 May to periodontal screening. Moreover, it created a mini-site in French and Dutch with useful information on gingival health for dentists and patients, and a list of all 200 dental practitioners taking part in the massive free screening across the country.

The Société Francaise de Pédodonto- logie et d’Implantologie Oral, the French society of periodontology and oral implantology, organised a multidisciplinary event together with endodontists, cardiologists and gynaecologists with the aim of educating and raising awareness about the link between periodontal and systemic health.

The Ukrainian Society of Periodon- tists organised a day of periodontal check-ups at the Shupyk National Medical Academy of Postgraduate Education in Kiev. Patients had the opportunity to learn about different periodontal treatment options, as well as strategies to improve their gingival health, including dental hygiene and lifestyle recommendations, particularly for young patients.

“Our association has been encouraging dentists and medical doctors to play their part in the treatment and diagnosis of periodontitis and to raise public awareness of periodontitis and its link to systemic health and general wellbeing,” said Daiwa Gelazienė, EFP delegate of the Draugiš Periodontology Lietuvos, the Lithuanian periodontal associa- tion. Among other activities, the society conducted events related to gingival health at schools in Vil- nius, with about 200 children participat- ing in a game of comparing their knowledge about and skills in keeping their mouths and bodies healthy. “The EFP’s communication tools have been very helpful,” noted Gelazienė. “We are very happy to be a part of this excellent initiative.”

Table 1. Example of the “dental trauma stamps”. This was taken at one week post op.
Advanced Restorative Techniques and the Full / Partial Mouth Reconstruction

PART 3: Treatment of severe wear cases

In part three, Dr Paul Tipton describes the diagnostic work required for the full mouth reconstruction at an increased vertical dimension.

By Prof. Paul Tipton, UK

Prosthodontists are often called upon to reconstruct the occlusion in patients with severe wear. There may be a multitude of issues to address in such cases, including attrition, abrasion, and erosion – all of which contribute to uneven wear and compensatory eruption throughout the arches. There may also be incisal wear and/or interproximal wear and, as a result, the occlusal plane may need leveling and lengthening for enhanced aesthetics and to allow correction and control of the occlusal relationship.

The aesthetic and functional requirements include a decision of the occlusal scheme to be used (part two) followed by determination of the incisal edge positions at rest, the occlusal plane, vertical dimension to work to anterior guidance, lip support etc. All this is achieved by the diagnostic wax-up. This article describes the diagnostic work required for the full mouth reconstruction at an increased vertical dimension.

Treatment planning

All comprehensive treatment planning should begin with an occlusal aesthetic evaluation. Evaluation of the face is essential in determining the ideal aesthetic orientation of the teeth from both a horizontal and vertical perspective. The horizontal reference planes will help the clinician align the occlusal plane and the soft tissue levels along with other related aesthetic determinants. The horizontal reference planes should be evaluated from two perspectives: the frontal and the sagittal. The frontal perspective is assessed by having the patient look out into the horizon and choosing the ideally leveled plane. The most commonly used horizontal reference planes include inter-pupillary line and inter-commissural line (Figure 1). Intra-oral photographs are also key at this stage (Figures 2-4). The following steps are essential to fulfilling the correct diagnosis.

Step 1: Mounted study casts

This is achieved by taking accurate alginate impressions of upper and lower jaws in rim-lock trays, face-bow recording and jaw registration around RAP. The technician can now mount the study casts in a semi-adjustable articulator (Figures 5-8).

Step 2: Vertical dimension

The first treatment planning decision is what vertical dimension to work at (part five). This can be established by the use of a wax squash bite placed into the patient’s mouth. As the patient is manipulated into RAP the lower teeth indent the wax bite. This can be removed, chilled in iced water and replaced as the patient and clinician now assess profile and facial aesthetics. In this way changes in vertical dimension can be transferred early to the technician on the articulated casts and the initial new occlusal plane assessed via an elastic band (Figures 7-8). Once mounted, the degree of over-eruption of either arch can be assessed (Figures 9-10) and casts adjusted (Figures 11-12).

Step 3: Lower incisal edge position

The incisal edge position, incisal plane and occlusal plane are the three most important aesthetic determinants in the development of the treatment plan. These determinants enable the clinician to transfer information throughout the treatment, and are related in specific ways to other aesthetic criteria. The first step in determining the position of the teeth is evaluation of the lower incisal edge position with the lips at rest (Figure 13). Tooth exposure is...
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considered to be in the orthon to ymm range dependant on age. To achieve the correct position the edges of the lower anterior teeth need to be short-ened or lengthened by either remover-stone or adding wax. For example, if crown lengthening is indicated on teeth that were previously ideally proportioned, the incisal edge length can be reduced. Establishing the cor-rec-t amount of lower tooth exposure de-pendent upon the age of the pa-tient at rest should be the goal. Once the final lower incisal edge position is determined, the lower occlusal plane is evaluated.

Step 4: Curve of Spee

For this the PMS method is used to establish the anatomically average curves of Spee and Monson, of the ra-diuss of a 4° circle. This is done using a Boyles plane analyser (Figure 14). For this three reference points are re-quired. One has already been estab-lished and that is the position of the lower incisal edge position as per the aesthetic requirements of the patient dependent upon age. The amount of wax added to the lower incisors or amount of stone removed from the lower incisors on the mounted study casts is established by using the lip as the reference plane and calculat-ing where the lower incisal edges are and where they should be. This new level is transferred to the technician so that his starting point for the wax-up is the two lower incisors. The two posterior reference points are the retro-molar pads (Figure 15), which have been shown not to change dur-ing life/tooth loss etc. There is a cer-tain amount of flexibility when es-tablishing these two reference points as being, half-way and two thirds of the way up the retro-molar pads. The lower occlusal plane is estab-lished by the Boyles plane analyser rest-ing on the waxed up or adjusted lower incisors and the two posterior reference points on the retro-molar pads. Any over-erupted teeth are ground down and any teeth not touching are waxed-up to the ana-lyser. This creates the ideal lower oc-cusal plane (Figures 16-18). The lower incisal plane should be level to the chosen horizontal reference plane (the inter-occclusal line, inter-papillary line etc), and evaluated from the frontal perspective while the patient is smiling. The next step is to evaluate the occlusal plane from a sagittal view of the patient’s smile.

**Step 5: Upper incisal edge po-sition**

Next, the upper incisal edge position should be established. This is done by aesthetics and phonetics, especially the F and Y sounds to establish the labio-lingual position. Aesthetically, the incisal edge position is evalu-ated in relationship to the upper lip at rest. Age is again used as a guide and it is common that the range of incisal edge show may be between 1mm and 3mm. The horizontal an-terior planes, inter-papillary line and inter-commissural lines are again used to establish the correct posi-tions. The midline position of the upper incisors can be taken from several anatomical landmarks such as the facial midline, nasal midline, lip midline etc. Studies suggest the closest anatomical landmark is the most important – i.e. the midline of the upper lip. Technicians and clini-cians should also realise the extent to which they can change midlines without reverting to root canal ther-a-py – approximately 3mm to 4mm depending upon the size of the teeth.

However, special tooth preparation techniques (beveling the interproxi-mal margin one side) are required to allow for this change. Even then soft tissue problems may occur as the gingival alveoli will move.

**Step 6: Establishing anterior guidance**

Any space between the lower incisal edges and the palatal aspects of the upper anterior teeth is now closed by waxing the palatal aspects of the upper palatal aspect down to contact the lower incisal edges to gain an in-cisal and canine step in the intercus-pal positions (Figure 19). Adequate anterior guidance is a complex func-tion directly related to the form of the teeth, and thus to the vertical and horizontal overlap of the inci-sors and canines. Anterior guidance is influenced by the proprioception of those teeth, which provides feed-back to the masticatory muscles and influences the entire masticatory system. Unlike the posterior deter-minants, such as the slope of the articular eminence, the vertical and horizontal overlap of the anterior teeth are – to variable degrees – ame-nable to modification. However, any modifications of the anterior teeth must satisfy not only the aesthetics and phonetics, but also the overall function. If the disclusive angle is too steep, temporomandibular joint or muscular discomfort may result.

**Step 7: Maxillary occlusal sur-faces**

Once the mandibular teeth are ideal in shape and form, wax is added to the maxillary posterior occlusal sur-faces to occlude against the mandib-u lar occlusal surfaces in the correct relationship. Correct occlusal shape and form and ridge and groove di-rection, depth of fosses and height of cusps are now established at the set vertical dimension dependent upon the choice of articulator, facebow and articulator setting devise, check bite, cadrax, pantograph (Figures 20- 22).

**Step 8: Refine the occlusion**

The occlusal surfaces can be cor-rected to perfect the occlusal rela-tionship and to idealise the aesthetic
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† Containing 5% potassium nitrate and 1450 ppm fluoride as sodium fluoride.
‡ Containing 1450 ppm fluoride as MFP.

References:

INSTANT AIR BLAST SENSITIVITY RELIEF IN VIVO

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* p < 0.05 compared to baseline  • p < 0.05 compared to control

Baseline Immediately 3 days

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contours by the further addition or subtraction of wax. The final contours of the central incisors should be determined first, followed by the lateral incisors and canines, since the symmetry of these teeth is not as critical as the central incisors.

Step 9: Restoration

The final restorations can be seen in Figures 23 and 24. The step-by-step procedures in the restoration will be discussed during the next case study.

Case study

Mr. O was referred to me from Birmingham for a full mouth reconstruction (Figures 25-26). On examination there was marked amounts of wear present and loss of vertical dimension (Figures 27-28). Mounted study casts were taken and the vertical dimension – to which the final restorations were to be fabricated – assessed as per the previous discussion (Figures 29-30). The diagnostics and treatment planning protocols discussed in this paper were used to establish the ideal aesthetic and functional end result so that the diagnostic waxing, prep guides and prototypes were produced. Reconstruction then followed along established guidelines of initially an occlusion splint to establish the correct RAP prior to starting tooth preparation procedures. All teeth were initially prototyped starting with upper and lower anterior teeth then one side followed by another side over a period of three visits during one week.

Once the prototypes had been in place for a period of time to establish the correct occlusion, function and aesthetics and the patient was comfortable, sections of prototypes were removed, definitive preps, impressions, occlusal records and facebow were taken and final restorations fabricated and fitted. Again, upper and lower anterior crowns were fabricated and fitted first to establish and copy (via a custom-made incisal guidance table) the established anterior guidance (Figures 31-35). This was followed by one side then another in the same way. The final result can be seen in Figures 36 and 37. Finally, a post-restorative splint was made for night-time use.

Acknowledgements

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- Dr. James Russell, BDS, MSc, specialist in restorative dentistry
- Mr. Bradley Moore – dental technician, ADS Laboratory, Harrogate.

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Minimally invasive preparation treatment

By Dr Alina Lazar, Germany

In this case, the patient – a 26-year-old female – approached the practice after finding us on the internet. She had already visited three other dentists for a consultation with her main complaints being crowding and dental erosion of her anterior teeth. Part of the problem was that she had been drinking more than one litre of sugary drinks, such as cola and juice, every day – one of the leading causes of dental caries and enamel erosion.

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Once the digital smile design analysis and mock-up were complete, only the finishing touches were left. The initial part of this was crown lengthening to 14, 15, 22, 24 and 25, which took place at the same time as the preparation. Shortly after, non-prep- aration veneers were placed on 14, 15, 24 and 25 and veneers were placed on 11, 13, 21 and 23. Additionally, a partial crown was bonded to 12 and an IPS e.max Press from Ivoclar Vi-

References


Dr Alina Lazar has been practicing dentistry since 1994 and founded ‘Praxis Dr. Alina Lazar’ in Germany in 2001. She completed further qualifications to become a Specialist in Aesthetic Dentistry in 2012 and is a certified provider of the IAS Inman Aligner in 2013. Alina also completed the IAS Advanced training course in 2014 to develop her knowledge and skills in anterior alignment.

practice. Although finishing with composite contouring or veneers depends on the case that is presented, the most important element is to work as minimally invasively as the case allows. Indeed, I have found that when the above mentioned steps are carried out in the same way as this particular case study, a very satisfying result can be achieved.
The IAS Inman Aligner course is part of the IAS Academy pathway of training for GDPs. The course is now a continuum and 2 cases must be submitted and evaluated on completion for website listing.

For more information on the IAS Inman Aligner and upcoming training courses, please visit www.inmanaligner.com or call 0845 366 5477

Inman Aligner Academy Certification Courses in GCC

By Dental Tribune MEA/CAPPmea

The Inman Aligner is the perfect solution for crowding or protrusion of the front teeth. It is really fast, very safe and great value. With the patented Inman Aligner, your front teeth can be gently guided to an ideal position in a matter of weeks. Most cases complete in 6-18 weeks and because it’s removable you can take it out to fit with your lifestyle (inmanaligner.com).

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Interview:
“Technology leads to better dentistry”

By Dental Tribune MEA/CAPPmea

During the 11th CAD/CAM & Digital Dentistry Int’l Conference, which recently took place on 06-07 May 2016 at Jumeirah Beach Hotel in Dubai, Dental Tribune MEA had the pleasure of interviewing several international experts about the latest dental technologies. The organizer, CAPP, had gathered together an impressive scientific lineup consisting of renowned international speakers, so we managed to ask the same questions to some of them. Let’s compare their different opinions.

Dental Tribune MEA/CAPPmea: Have digital solutions changed the way dentists are performing nowadays?

Dr. Eduardo Mahn, Chile: In my opinion, the answer is both yes and no. Certain methods work much better now, especially with the help of digital dentistry and CAD/CAM technologies, as these have become standardized protocols whilst other methods remain unchanged due to technological and mechanical restrictions. Digital solutions have not necessarily improved the way dentists work directly. We all still need to perform a lot of the steps by ourselves anyway, for example we are the ones who prepare the teeth we need to cement using restorations made by CAD/CAM machines.

Prof. Jan-Frederik Güth, Germany: Digital solutions have not changed the principles of dentistry. They have more to do with the way we work as dentists, bringing more predictability and analyzing 3D datasets, using analytic tools that offer us more than just CAD/CAM dentistry. This is what makes it more valuable. I believe digital solutions have not revolutionized but evolved dentistry. It is an ongoing process.

Asst. Prof. Dr. Cagdas Kiskaoug, Turkey: Digital solutions help us in every way. They allow us to work faster and more efficiently, and give us the ability to foresee everything. Digital technologies have become an important part of our daily life and this trend will continue to grow in the future. In my opinion, every dentist will have to use digital dental solutions sooner rather than later.

Dr. Michael Dieter, Switzerland: Yes, digital technologies have definitely had a great impact on dentistry. I first came into contact with digital dentistry in 1998 when I became very fascinated by CAD/CAM systems that had just been launched at the time. Now, eight years later, the technology has already been tested through real life situations they receive immediate feedback and that’s what makes them better dentists. It is not about the technology itself, but the technology leads to the fact that dentists have become better.

What part does CAD/CAM and digital dentistry play in the development of dental specialties?

Dr. Eduardo Mahn, Chile: I believe it is an important one. Nowadays, CAD/CAM is playing a new role in many processes and many specialties: not only in prosthodontics or restorative dentistry, but also in orthodontics, implantology and surgery.

Dr. Jan Paulics, Denmark: Actually, if you view dentistry from a new perspective, not seeing the clinic and the dentist as separate, but seeing everything combined in a complete workflow. So instead of simply taking the patient in and taking care of them, you start at the beginning by digitizing everything. When someone comes into the clinic we first scan the patient, then we sit together and go through everything that is happening in their mouth. From there on, we can plan the treatment together. In this way the patient is fully involved and there is no need to sell any treatment to them; they will be the ones to ask for it instead.

Prof. Jihad Abdallah, Lebanon: Well, digital dentistry was something I had been looking for that I found in CBCT. I thought it would be great to use in the field of implant dentistry. When the patient comes into the office and you have a CBCT machine, you can easily find the data you need to plan and execute the case. Sometimes you need to do CBCT during surgical planning in very complex cases. Only when we received the CBCT machine in the office, did we understand the power of digital dentistry. The technology also allowed me to take it a step further by acquiring an intraoral camera and a milling machine.

Do you think that digital dentistry is the future of dentistry?

Prof. Jan-Frederik Güth, Germany: Absolutely. What is happening at the moment is that we have what I call different island solutions in digital dentistry: intraoral scanning, face scanning, digital articulators, everything is now connected together so we can put bridges between all those islands. This is where development takes part. If one day this connection happens to become complete, digital dentistry will make even more sense because its value will increase.

Prof. Jihad Abdallah, Lebanon: Yes, the development of digital dentistry will give more prospects for different in-office treatments and dentists will be able to offer better treatments to their patients.

Michele Temperani, CDT, Italy: Technology is a good thing and it’s something that can’t be stopped. Eventually, most of the work will be done by machines but the handicap of dental technicians will always be the best. What might happen is that dental technicians would do high quality work using their own hands, which would be considered of the highest value and probably not many people would be able to afford it.

What are the advantages of digital dentistry?

Dr. Eduardo Mahn, Chile: The main advantage of digital dentistry is that machines are accurate and can...
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Dr. Tif Qureshi, UK: The advantage of digital dentistry is that you have the ability to predict where you are going to go, to control things. So, the orthodontists could be very easy to lose control of the inclusion if you weren’t able to see where the teeth were going to move to. When we know where the teeth are going to move to we can then plan our anterior guidance, canine lateral guidance and we can make sure that the patients are functioning not only as well but potentially even better after the orthodontic treatment. The digital step forward we have had in orthodontics has been enormous. The other thing we are able to do with digital dentistry is that we can actually start to preview the shape of required teeth. Sometimes it is hard to understand but when you have teeth that are crooked they tend to be wide and bulbous. When teeth have been straightened and put in the full arch they need to be slightly arrowed and having seen this digitally all upfront, dentists have much better guidance how to shape correctly to get a much better result.

Are there any limitations of digital dentistry?

Dr. Eduardo Mahn, Chile: Machines still do not complete the entire work process. They can create a crown but you still need to polish it, glaze it and give it definition. The software and the database of patients’ teeth do not automatically create a beautiful smile so there is still the need of a human touch.

Prof. Jan-Frederik Güth, Germany: I think they vary, depending on the individual system you use and whether it is open or closed. For example, full arch intraoral scans are still very dependent on how you scan them and whether you need powder or not. We must be aware of the specific technology and look for treatment concepts to use with it.

Dr. Tif Qureshi, UK: Yes, definitely, there should be limitations in orthodontics. Something that’s very important and that we teach is to make sure that GP dentists start at first with very limited cases. They should be primarily working in the anterior teeth only. If the teeth require movement in the back of the mouth, that should be treated by an orthodontist, unless the dentist has a huge matter of experience. So, with Inman Aligner and Clear Aligner and with everything we teach in the IAS Academy, we are making sure that the dentists are focusing on the front region and only treating minor tooth movement, if at all.

Dr. Michael Dieter, Switzerland: Frankly, I do not see any limitations in general. Currently, the question is rather how many dentists are using digital technology specifically when they need to go into a big investment. This applies for both dentists and dental technicians. The fact that there are different systems, open and closed, can be seen a limitation. In my opinion, the bigger problem are the investments. Also, the systems should be a little bit adjusted so that dentists can work with different software and hardware manufacturers.
Virtual reality simulation

Indications and perspectives for the technology in the field of dental education

By Dr Susan Bridges, Suzanne Perry & Head of Oral Health, Hong Kong & Australia

Virtual reality (VR) simulation inevitably conjures up images of futuristic technology, imaginary worlds or complex robotic devices. What it may not initially suggest is the use of virtual technology as a means of training dental students and dentists, facilitating the development of skills in a safe and relaxed environment.

An increase in demand for simulation units over the last ten to twenty years has indicated growing interest from dental schools, suggesting a certain confidence that simulation systems have potential as a recognised form of dental skills training in the future. Using technology inspired primarily from the flight simulation industry, dental simulators are now able to create an environment in which users can practise clinical procedures, such as restorative dentistry, endodontics, periodontal assessment, implant placement and even dental extractions.

These systems are a far cry from the first phantom head simulator created in the early 1900s that attempted to represent the oral cavity with a relatively primitive set of upper and lower dental casts mounted on a metal pole (Fig. 1). Although phantom head systems are now the mainstay for undergraduate training, educators are becoming more aware of the additional benefits of virtual reality simulation.

By Naz Haque, UK

At the heart of the relationship between a dentist and a patient lies trust and respect. Recent events, such as the Sony or, more currently, the Ashley Madison breach, have brought to public awareness the importance of securing one’s data.

Data security and governance is a very tricky area. I must make it clear I am not a lawyer, but I am a highly experienced information technology professional with a good understanding of data protection and other relevant legislation. All interpretations provided here are my own.

Even if a dental practice has not embraced the digital age and all records and correspondence are ink and paper based, the practice still has a number of responsibilities regarding data security. As dental practices collect patient details, they must understand the Data Protection Act (Software of Excellence), it should be a priority. Here in the UK, the ICO can issue monetary penalty notices, requiring organisations to pay up to $500,000 for serious breaches of the DPA occurring on or after 6 April 2010. Clients at Dental Focus expect us to take care of online compliance and provide guidance on keeping up to date and resolving these issues. Make sure your data is secured and protected before it is too late.

This article was published in CAD/CAM International Magazine No. 4, 2015

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Indications and perspectives for the technology in the field of dental education

Data security: How not to become the next Ashley Madison

Naz Haque, aka “The Scientist”, is Operations Manager at Dental Focus. He has a background in mobile and network computing, and has experience supporting a wide range of blue-chip brands, from Apple to Xerox. As an expert in search engine optimisation, Naz is passionate about helping clients develop strategies to enhance their brands and increase the return on investment from their dental practice websites. He can be contacted at naz@dentalfocus.com.
Further research will be needed to establish the effectiveness of the technology.

What are haptics?
The addition of haptics to VR technology creates a dimension of sensory feedback for the user. The word itself originates from the Greek work haptikos, which means “to touch or grasp.” There are many examples of haptic simulation in modern-day technology, such as in gaming and the vibration component of a mobile phone. The aim of haptics in many cases, and especially simulation, is to improve the realism of the virtual experience. In dentistry, for example, when carrying out a cavity preparation on a haptic VR simulator, there is a difference in hardness felt when cutting from enamel to dentine, and if the pulp is damaged an instant loss of resistance occurs, producing a realistic sensation of drilling through the roof of the pulp chamber (Figs. 2 & 3).

Naturally, the important question is, does the addition of haptic technology really make a difference when learning using VR simulation? To answer this, we have to delve into surgical research for which a stronger evidence base exists, specifically in the area of laparoscopy. A review of the use of haptics in surgery suggested that the addition of haptics to simulation can reduce surgical errors and is especially beneficial in the early stages of learning a new skill task. Other studies have shown that the addition of haptics may improve overall performance of surgical skills and may be beneficial when a trainee is first exposed to a clinical situation. In dentistry, small-scale studies of haptic VR simulators suggest that they are at least as good as phantom heads in training undergraduates.

The future of VR simulation in dentistry
Currently, exciting research involving the universities of Hong Kong and Melbourne is looking into gaining solid evidence concerning the use of haptic VR simulation in the dental undergraduate curriculum. By utilising neuroimaging techniques, identification of the traits an expert usually displays can occur, which in turn can be built into training pathways to enhance the effectiveness of procedural learning. Dental findings have suggested that distinct differences may be apparent in the brains of dental experts and novices during a simulated clinical task when using a dental haptic VR simulator. Further work in this area is to be carried out, with additional investigation into the positioning of haptic VR simulations within the curriculum and considering its effectiveness compared with traditional phantom head training techniques. Already it can be seen that the area of VR in dentistry and especially that of haptic VR simulation is proving an interesting development, offering encouraging prospects for the future.

In dentistry, small-scale studies of haptic VR simulators suggest that they are at least as good as phantom heads in training undergraduates. There is a compelling need to expand the current research base.

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Prof. Michael Burrow is Professor and Chair of the Melbourne Dental School of the University of Melbourne. He can be contacted at mfburrow@mfb.com.au

Dr Susan Bridges is an associate professor at the Faculty of Education at the University of Hong Kong in China. She can be contacted at sbrides@hkbu.edu.hk

Suzanne Perry is a PhD candidate at the Faculty of Education at the University of Hong Kong. She can be contacted at subygee@yahoo.co.uk

Study finds fundamental misconceptions about dental implants among patients

By DTI

HONG KONG, China: Investigating patients’ knowledge and perceptions regarding implant therapy, a Chinese study has found that an alarming number of participants had inaccurate and unrealistic expectations about dental implants. Moreover, the study determined that only 18 per cent felt confident about the information they had about the treatment.

In the study, the researchers investigated preoperative information levels, perceptions and expectations regarding implant therapy via a questionnaire. Responses from 277 patients were obtained during 2014 and 2015 in three different locations in China (Hong Kong, Sichuan and Jiangsu).

The analyses established that about one-third of the participants had mistaken assumptions about dental implants. According to the researchers, common misconceptions were that dental implants require less care than natural dentition, implant treatment is appropriate for all patients with missing teeth, dental implants last longer than natural dentition, and there are no risks or complications with implant treatment.

Overall, younger respondents (< 45) and those with higher education (bachelor’s and postgraduate degree) tended to have more realistic perceptions and lower expectations of the treatment outcome.

When asked about their level of knowledge, 63 per cent of the participants said that they were generally informed about implants, but only 18 per cent felt confident about the information they had.

The study, titled “What do patients expect from treatment with dental implants? Perceptions, expectations and misconceptions: A multicenter study”, was published online ahead of print on 3 March in the Clinical Oral Implants Research journal.

Prof. Michael Burrow is Professor and Chair of the Melbourne Dental School of the University of Melbourne. He can be contacted at mfburrow@mfb.com.au

Dr Susan Bridges is an associate professor at the Faculty of Education at the University of Hong Kong in China. She can be contacted at sbrides@hkbu.edu.hk

Suzanne Perry is a PhD candidate at the Faculty of Education at the University of Hong Kong. She can be contacted at subygee@yahoo.co.uk

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Prof. Michael Burrow is Professor and Chair of the Melbourne Dental School of the University of Melbourne. He can be contacted at mfburrow@mfb.com.au

Dr Susan Bridges is an associate professor at the Faculty of Education at the University of Hong Kong in China. She can be contacted at sbrides@hkbu.edu.hk

Suzanne Perry is a PhD candidate at the Faculty of Education at the University of Hong Kong. She can be contacted at subygee@yahoo.co.uk
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Dentsply Sirona Instruments Introduces Online Knowledge Sharing Platform for Laser Dentistry

By Dentsply Sirona

Dental lasers are an easy way to provide dentists and their patients with greater comfort and more treatment options. The range of application possibilities has been considerably improved as a result of blue laser technology—an opportunity to increase the popularity of laser dentistry. In order to promote knowledge sharing in laser dentistry, Dentsply Sirona introduced the first international online platform.

BENSHEIM/SALZBURG: The development of blue laser technology has vastly increased the possible applications of diode lasers in dentistry and, at the same time, created greater awareness of laser dentistry. The international “Sirona Laser Platform” from Dentsply Sirona, which was introduced at the beginning of March, is meant to acquaint dentists with the different areas of laser dentistry in a lively way. Dentists who wish to take advantage of this opportunity can receive free access to the knowledge-sharing platform of the global market and technology leader in the dental industry via the link http://www.sirona.com/en/sirolaser.

The information available on the platform is very diverse and encompasses the various types of lasers in the market, the differences between diode and traditional lasers and how they work. Images and videos are also used to illustrate the different application areas of dental lasers. Experience reports on the new SIROLaser Blue, clinical case examples and the possibility to view upcoming training courses on specific products all complement the range of information offered.

Additionally, a corresponding forum is included in this platform as well. This gives participants a place to exchange knowledge and information on all things related to laser dentistry with other colleagues. Whether it be difficulties, treatment approaches or everyday tips, the community is welcome to openly discuss all dental-related experiences with lasers.

Blue lasers are especially well-suited for surgical procedures. Lasers were introduced about 50 years ago and have been used in dentistry since the mid 1990s, especially the diode laser. The SIROLaser Blue is one of the newly developed diode lasers. The Blue laser light, with a wavelength of 445 nm, is mainly indicated for soft tissue surgery because of the superior absorption properties and excellent cutting performance; however, it is also used in implantology and prosthetics. This allows dentists to offer their patients virtually pain-free treatment.

Blue lasers are especially well-suited for surgical procedures. Lasers were introduced about 50 years ago and have been used in dentistry since the mid 1990s, especially the diode laser. The SIROLaser Blue is one of the newly developed diode lasers. The Blue laser light, with a wavelength of 445 nm, is mainly indicated for soft tissue surgery because of the superior absorption properties and excellent cutting performance; however, it is also used in implantology and prosthetics. This allows dentists to offer their patients virtually pain-free treatment.

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You’re Worth It.
New sugar tax could save South Africa billions in health care costs, experts say

By DTI

JOHANNESBURG, South Africa: Calculations by the University of the Witwatersrand suggest that South Africa’s sugar-sweetened beverages tax, which is underway and proposed for implementation in April 2017, could save the country R10 billion (€560 million) in expenditure related to treating Type 2 diabetes over the next 20 years. The fiscal initiative, which was introduced by Finance Minister Pravin Gordhan in his national budget speech in February, is an effort to help reduce excessive sugar intake and curb obesity in the country.

Although Gordhan said that the sugar tax will be implemented in April next year, he has not yet said how high the levy will be. With the measure, South Africa will follow countries such as Denmark, Finland, France, Hungary, Ireland, Mexico and Norway, which all tax sugar-sweetened drinks already.

"Treasury will need to decide on the tax rate and what qualifies to be taxed," remarked Aviva Tugendhaft, Deputy Director of PRICELESS SA at the university’s School of Public Health. The research programme is one of 26 representatives of the Public Health Community of South Africa that submitted a letter to treasury endorsing the tax plans in April. "The government may decide to institute a flat rate on all beverages, as has been done in Mexico, or consider taxing the caloric content of the drinks," she said.

Both financial and health benefits resulting from the levy on beverages with added sugar, including soft drinks, fruit juices, energy drinks and vitamin waters, could be extensive, a 2015 study by Wits University has shown. If the tax is implemented at 20 per cent, Wits researchers calculated savings of R10 billion in costs for hospitalisations and medication related to treating rising cases of Type 2 diabetes. Moreover, the analysts estimated that the tax could prevent obesity in about 280,000 young adults.

South Africa has the highest obesity rate in sub-Saharan Africa. According to figures from the World Health Organization, 26.8 per cent of South Africans were obese in 2014. Just last year, the country’s health department released its national strategy on the prevention and control of the condition. It stated that fiscal measures were the most cost-effective ways to combat rising obesity compared with measures such as food labelling, advertising regulations or media campaigns.

Aside from increasing the risk for obesity, various studies have confirmed the direct relation between the intake of dietary sugars and dental caries. Soft drinks and juices are especially harmful to the teeth, since they tend to be very acidic, which makes the teeth particularly vulnerable to both dental decay and tooth erosion.

South Africa’s Finance Minister Pravin Gordhan proposed introducing a tax on sugar-sweetened beverages as of April 2017 in the national budget speech in February. (Photograph: feelphotoz/pixabay)
CAPP launches new long-term “Associate Fellowship” and “Diploma” CME programs in Dubai

By Dental Tribune MEA/CAPPmea

DUBAI, UAE: The Centre for Advanced Professional Practices (CAPPmea) has launched two new long-term programs for continuing dental education starting in Dubai coming September 2016. The programs are in partnership with the American Academy of Clinical Orthodontics (AACO) which will award 210 CME and an Associate Fellowship to successful participants. The program is accredited by the American Academy of Clinical Orthodontics (AACO) which will award 210 CME and an Associate Fellowship to successful participants.

The program is based on in-depth clinical experience and practical knowledge of various orthodontic treatment procedures ranging from diagnosis to finishing and detailing, relevant to the management of basic clinical situations. Participants will also benefit from well-documented case studies offering a detailed step-by-step approach to treatment planning. The course aims to give participants a deeper understanding of the biological and mechanical principles of tooth movement through various appliances and protocols thus contributing to a more complete appreciation of the science and art of contemporary orthodontic treatment.

The program focuses on “individualized diagnosis,” and customized treatment mechanics and care” in order to carefully match and optimize all aspects of patient care. After all, it all boils down to helping clinicians treat their patients with better results.

The program will be conducted by Dr. Dubravko Pavlin, Dr. Brent Callegari, Dr. Bradley Pierson, Dr. Bryan Jennings, Dr. Ryan Reyes and Dr. Doug Lienis from the United States of America.

The two-year-long course comprises of a series of lectures, practicals on phantom-heads, seminars and webinars, aiming to teach dentists to apply scientifically proven restorative and aesthetic techniques in order to achieve great results. After the courses, clinicians will also gain more confidence in taking on more complex cases and ultimately find better job prospects, increase their income and transition into successful private practices. The unique program has been very successful for over 20 years with Professor Paul Tipton in the United Kingdom and can be seen as a pathway to a further MClinDent with City of London Dental School (CoLDS) or an MSc with Manchester University.

The program is taught by some of the most experienced, knowledgeable and passionate lecturers, whose enthusiastic approach aims to inspire participants to improve their skills and become more confident in their daily practice including the likes of: Prof. Paul A. Tipton, Prof. Edward Lynch, Prof. Goran Under, Prof. James Richard, Prof. Geoffrey Sharp, Dr. James Russell, Dr. Julian Caplan, Dr. Adam Toft and Mr. Jonathan Parsonson.

CAPP-Tipton Dental Academy has prepared special registration packages for delegates willing to take on the diploma challenge including a promotion for everyone who recommends the courses to their friend/colleague.

Registration for the programs in Practical Clinical Orthodontics and in Restorative & Aesthetic Dentistry are now available on www.cappmea.com/capp-tipton and www.cappmea.com/ortho.

Restorative & Aesthetic Dentistry Course – Diploma with British Academy of Restorative Dentistry

CAPP-Tipton Dental Academy is launching the Restorative & Aesthetic Dentistry Diploma course in Dubai, starting on September 15th, 2016. The two-year program will award successful participants 210 CME, accredited by the American Dental Association, Dubai Health Authority and Health Authority Abu Dhabi and a further diploma upon completion and successful passing of the exams.

The program is divided into two parts. During the first year of study participants will be able to participate in 4 modules over a total of 15 days. Obtaining 105 CME. Upon successful completion, participants will receive a Certificate in Restorative Dentistry from the British Academy of Restorative Dentistry (BARD).

Holders of the certificate will be qualified to resume their study for Year 2 Diploma. Part 2 is also grouped into 4 modules spanning 15 days, leading to a Diploma in Restorative & Aesthetic Dentistry from BARD after passing exams which include several parts including submission of 5 clinical cases.

Each of the two-year-long course comprises of a series of lectures, practicals on phantom-heads, seminars and webinars, aiming to teach dentists to apply scientifically proven restorative and aesthetic techniques in order to achieve great results. After the courses, clinicians will also gain more confidence in taking on more complex cases and ultimately find better job prospects, increase their income and transition into successful private practices. The unique program has been very successful for over 20 years with Professor Paul Tipton in the United Kingdom and can be seen as a pathway to a further MClinDent with City of London Dental School (CoLDS) or an MSc with Manchester University.

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Bristol researchers receive funding for super-chlorhexidine

“We’re very excited about Pertinax’s potential.”

By DTI

BRISTOL, UK: A University of Bristol spin-off has been awarded almost £1 million to bring a new technology to the market that could help to fight infections in the mouth and body. An enhanced form of chlorhexidine, the substance, named Pertinax, is said to offer improved properties compared with those of the original substance.

Overall, Pertinax Pharma has received around £900,000 from southern England technology investor Mercia Fund Management, Innovate UK (through its Aid for Start-Ups scheme) and an unnamed private investor. The company’s founder and chief scientific officer, Dr Michele Barbour, who is also a senior lecturer in biomaterials at the university’s School of Oral and Dental Sciences, said that the company will focus on the development of applications in dentistry first, where the technology already has relevance to a number of areas. Further uses in medicine will follow in time.

“We’re very excited about Pertinax’s potential,” she said.

A proven antimicrobial agent, chlorhexidine has been used in a wide range of products and treatment processes to prevent and treat bacterial infections. Since it is a new formulation of the substance, Pertinax is reported to possess the same antibacterial properties, but without some of the shortcomings of the original formulation, such as short efficacy time. Possible future applications are in cements to reduce the failure rates of dental fillings, for example.

“With a strong management team and innovative product, Pertinax Pharma has the potential to take its product from dental tool to a must-have anti-infective across a wide range of industries, from veterinary care, to cosmetics and even home appliances,” Investment Manager at Mercia Fund Management Dr Brijesh Roy commented.

Mercia Fund Management recently provided funding for another oral health care-related project by the University of Manchester.

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Why Practice Management?

By Dr. Ehab Heikal, Egypt

Historically, dentistry has been a closely regulated field in terms of management, marketing and business ethics. Dentists were educated to achieve one goal—clinical excellence. The notion of marketing a clinic, selling services or even discussing ideal business models and profitability simply were not (and in the majority of Universities, is still not) part of the curriculum, as some dentists felt these concepts somehow detracted from the professionalism of the industry.

As a dentist, I understand and appreciate that some dentists find a focus on dental management, marketing or business efficiency to be contrary to achieving clinical excellence. However, in today’s world, I believe clinical excellence and an efficiently operated business only complement rather than contradict one another.

Practice management and quality of patient care

One point of view to consider is that failing to operate a clinic efficiently or not consistently providing outstanding customer service can detract from a dentist’s ability to provide excellent clinical care and a positive patient experience.

A clinic that is disorganized or chaotic, for example, does not provide its patients with the highest quality of patient care. Inefficiencies in a clinic will lead to scheduling confusion, which often causes chaos, rushing and frustration for the doctor and patient.

Inefficiencies in a clinic will grow. This does not detract from, but rather enhances, clinical care. But, does implementing Practice Management make us focus only on profits and the money side of our clinic?

Clinics operating in a fast-paced, disorganized environment often fail to provide patients with a comprehensive oral examination. In many instances, the dentist spends less than five minutes examining a patient, and the focus is on identifying active caries, soft-tissue disease or restorative work that is obvious and in need of repair. Rarely in this disorganized environment does time allow the dentist to focus on reaching optimal oral health through innovative and comprehensive clinical and elective services.

Clinics that lack a sufficient profit margin will be unable to invest in new technologies, invest in continuing education or use the best products and materials. Dental clinics, like hospitals, are faced with the ever-increasing cost of technology. The addition of items such as practice management software and digital radiography systems require that certain levels of cash flow and profitability be maintained to afford a technology investment. In time, a clinic that does not invest in new technologies, materials and services fails to offer its patients the highest level of care.

Inefficiencies in a clinic are compounded by the fact that approximately 5 percent of patients are no-shows or last minute cancellations each year. Close to 30 percent of patients are overdue for periodontal maintenance (Not mentioning oral cancer screenings that is rarely done, if ever done!!). These numbers only illustrate further why clinics must have systems in place to provide comprehensive diagnosis and treatment to all patients, as well as effective care for overall excellence in oral health treatment.

What these examples also indicate is that efficient management systems and follow-up procedures allow practices to track and interact better with patients, ultimately providing these patients with the opportunity for excellence in dentistry. The goal of efficient dental management is to help dentists and their staff teams achieve their personal and professional goals by providing a solid business foundation from which to grow. This does not detract from, but rather enhances, clinical care.

Balancing quality care and ethics

In no way am I suggesting that a total focus on money at the expense of the best interests of patients is the proper way to practice dentistry. Practice management is a very broad field that covers hundreds of different subjects, and only one of these is practice profitability. A comprehensive practice management program also must consider the enjoyment of the dentist, satisfaction and training of the staff, level of stress in the clinic, proper care of emergency patients, patient financial arrangements, treatment, presentation and case acceptance, technology investments, continuing education and more.

But those who lump critical practice management issues into one category and proclaim they detract from clinical care rather than enhance it misunderstand the very purpose of better practice management excellence in all areas of the practice.

Efficient practice management is about much more than profitability. It is about educating and motivating patients to achieve optimum oral health by incorporating the best business methodologies and systems into the management of all clinic operations. Effective practice management cannot be accomplished without gaining the overwhelming satisfaction and trust of every patient. This can be achieved only through excellence of care and by achieving the high professional standards that dentistry currently demands.

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Do you notice blood when you brush?

Bleeding gums are one of the first signs of gum disease, a major cause of tooth loss.
Dubai Dental Week gathered 2128 professionals from all over the world

By Dental Tribune MEA/CAPPmea

DUBAI, UAE: This year’s 11th CAD/CAM & Digital Dentistry International Conference, which took place from May 04-09 at the Jumeirah Beach Hotel in Dubai, can boast a great record of international dental attendance. Catering to the scientific and business needs of dental specialists, the nearly week-long forum gathered a total of 2,128 professionals from across the world. The conference is considered the most important industry event in the region, and the organizers – the Centre for Advanced Professional Practices (CAPPmea) and the Emirates Dental Society had prepared an impressive line-up of top lecturers and a number of accompanying events.

The conference was an incredible opportunity for dental teams to obtain up-to-date professional and scientific information through a series of innovative presentations and hands-on courses covering a variety of multidisciplinary topics in digital dentistry and continuing dental education.

This year the agenda offered a wide variety of top quality scientific sessions, lectures and panel discussions by industry leading experts in dentistry and dental technologies, a great deal of hands-on courses, as well as networking opportunities with leading dental providers, distributors and experts from all over the world.

The renowned international speakers who took part in the 11th CAD/CAM & Digital Dentistry International Conference 2016 were Prof. Jan-Frederik Schwerin (Germany), Dr. Michael Dieter (Switzerland), Asst. Prof. Dr. Cagdas Kizilgoz (Turkey), Prof. Jihad Abdallah (Lebanon), Asst. Prof. Joseph Sabbagh (Lebanon), Dr. Martin J. Besek (Switzerland), CDT Vanik Kaufmann-Jinoian (Switzerland), Dr. Kieli Dimov (Bulgaria), Dr. Giuliaume Joannyn (France), Dr. Jan Paulics (Denmark), Dr. Tif Qureshi (UK) and Dr. Eduardo Mahn (Chile).

They discussed current issues in digital dentistry, aesthetics, prosthodontics, implantology, restorative dentistry, endodontology, etc.

The panel discussions following the sessions proved a useful way to trigger an exchange of viewpoints among experts with the audience and further increase the participants’ understanding of the subject at hand.

With the constant increase in demand for hands-on approach, CAPP partnered with several international key opinion leaders and industry partners to offer a total of 15 hands-on courses spread over six days. The limited enrollment allowed participants the maximum opportunity to practice the skills in a hands-on format.

Among the events that took place parallel with the 11th CAD/CAM & Digital Dentistry Conference were the Dental Technicians International Meeting and the traditional industry exhibition.

The Dental Technicians International Meeting was attended by over 200 international dental technicians, clinical dental technicians, laboratory owners and other visitors. The meeting focused on the hottest topics of interest not only for technicians and lab-owners, but also for the entire dental technology profession.

The panel of speakers included some of the industry’s most respected experts: Vanik Kaufmann (Switzerland), Michele Temperani (Italy), Alham Farah (Syria), John Phillips (Canada), Christopher Adamus (Denmark), Yamen Chaban (Germany), Professor Dr. Cagdas Kislaoglu (Turkey), Prof. Joseph Sabbagh (Lebanon), Asst. Prof. Dr. Cagdas Kizilgoz (Turkey), Prof. Jihad Abdallah (Lebanon), Asst. Prof. Joseph Sabbagh (Lebanon), Dr. Martin J. Besek (Switzerland), CDT Vanik Kaufmann-Jinoian (Switzerland), Dr. Kieli Dimov (Bulgaria), Dr. Giuliaume Joannyn (France), Dr. Jan Paulics (Denmark), Dr. Tif Qureshi (UK) and Dr. Eduardo Mahn (Chile).

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Dental technicians also had a chance to attend a number of trainings titled ‘Round Table Clinic Trainings’, during which they had a chance to ask their questions and immediately receive valuable insight from the presenters while practicing hands-on.

The top leader manufacturers generously sponsored the conference to contribute for the developing of these advanced technologies. The exhibition taking place during the conference days was designed to showcase the sponsors’ latest CAD/CAM & digital technologies, materials and techniques, as well as promote innovative ideas and services. The exhibition provided great business opportunities for all parties – delegates, visitors and trade representatives.

The 11th CAD/CAM & Digital Dentistry International Conference welcomed dentists, providers and experts from 35 countries in Europe, Asia, Africa, Australia and the Americas. The organizers, CAPP and Emirates Dental Society re-established the reputation of the conference as the industry’s leading international scientific event and proved its increasing popularity. In the words of Dr. Aisha Sultan, who opened the 11th CAD/CAM & Digital Dentistry International Conference, the forum is a gateway to knowledge acquisition so that all dental professionals may follow the latest developments in dental world.

For more information about the conference and upcoming scientific events in the MEA region, visit cappmea.com

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Panel discussion during the scientific session at the 11th CAD/CAM & Digital Dentistry Int'l Conference

Round Table Clinic Trainings during Dental technician Int'l Meeting 2016

Participants during the scientific session at the 11th CAD/CAM & Digital Dentistry Int'l Conference
CAPP thanks all sponsors, delegates, speakers & exhibitors!
Poor dental health may predict reduced ability to leave one’s house

By DTU

SENDAI, Japan: Researchers in Japan have investigated the association between poor dental health and being housebound in the elderly, and found that having fewer teeth and no dentures were associated with future risk of being homebound, especially in people aged 65-74. The findings may have important implications for interventions that promote dental health and denture use to prevent older people from becoming confined to their homes.

The longitudinal cohort study used data of 2,035 men and 2,355 women who responded to two postal surveys conducted in 2006 and 2010 and were not homebound, defined as leaving their home less than once weekly, at baseline. After the four-year study period, 334 (7.4 per cent) of the respondents were homebound.

With regard to dental status, the researchers found that, overall, participants with fewer teeth were twice as likely to be confined to the house than those with more teeth were. Almost 20 per cent of the homebound respondents had fewer than 20 teeth and no dentures, about 9 per cent had fewer than 20 teeth and dentures, and about 4 per cent had 20 or more teeth.

According to the researchers, several possible pathways may link dental health and being bound to one’s home. For example, dental health, including loss of teeth, affects food choice and nutritional intake, conversation, and facial attractiveness. Therefore, poor dental health could negatively influence social activities, leading individuals to isolate themselves from others. Being housebound in itself is a barrier to access to dental care.

The researchers concluded that future intervention studies focused on improving dental health in order to prevent older persons in the Japanese population from becoming homebound are required to verify the findings. They suggested that improving the rate of denture use among older people with fewer teeth could reduce the risk of becoming homebound in the future.

The study, titled “Does poor dental health predict becoming homebound among older Japanese?”, was published online in 30 April in the BMC Oral Health journal.

Testing toothpastes, toothbrushes

Improving dental hygiene products through virtual brushing

By DTUS

Designing toothpastes and toothbrushes is a time-consuming process involving the production of numerous samples. Using a new type of simulation, various parameters such as bristle shape and abrasive particle size can be modified with just a click. This enables manufacturers to improve the quality of new dental care products and bring them to market more quickly.

When we wake up in the morning, there is a fur-like coating on our teeth: this is a biological film that forms overnight. Over time, this can lead to the development of cavities — which is why it is critical that we remove this "rug" using a toothbrush.

There is a large selection of dental hygiene products on the market, including brushes whose bristles are rounded, pointed, hard, and soft. There are also brushes with bristles of varying lengths. Until now, to determine which ones clean the most thoroughly while doing as little damage to the tooth enamel as possible, manufacturers have had to conduct experiments. This was also the case when selecting the right abrasive particles to be used in toothpastes.

Various toothpaste formulations had to be mixed and then tested on artificial tooth enamel models — a laborious task. Another drawback to this approach is that the brush, paste and enamel can be analyzed as a complete system, which means that manufacturers have a difficult time determining which effects observed in these experiments are derived from which of the various parameters.

Help has arrived in the form of a new type of simulation developed by researchers at the Fraunhofer Institute for Mechanics of Materials IWM in Freiburg, Germany. "With our procedure, manufacturers of dental hygiene products can determine the cleaning effectiveness of each individual parameter in a fast, economical and reliable manner," says IWM scientist Dr Christian Nutto. "Unlike in real-world experiments, the individual parameters in the simulation can be easily modified — be it the size, shape and quantity of abrasive particles in a toothpaste, or the material from which they are made, or the shape and elasticity of the bristles."

Researchers can increase the scope of the experiments far beyond what is possible in real-world testing, and that makes a noticeable difference in the quality of the products. What effects do the shape and stiffness of the bristles have when brushing? How do the different abrasives or toothpaste viscosities affect the enamel, and how do they affect their intended target, the biofilm on the teeth? Simulation testing can deliver reliable answers to questions such as these, and it does so long before the manufacturer ever mixes the toothpaste.

Nutto relies on SimPARTIX® simulation software developed at the IWM, which uses the Smoothed Particle Hydrodynamics (SPH) particle simulation method. "We specify characteristics for the abrasive particles such as density, shape and fill factor," he says. Even parameters for the tooth enamel are included. The virtual toothbrush bristle is then rubbed over the tooth enamel, with the simulation providing data on how the scrubbing particles interact with the elastic bristle. It also calculates cleaning effectiveness, as well as the aggressiveness of the abrasives against the tooth enamel. Here, the team from the Powder Technologie Fluid Dynamics group can vary the speed at which the bristles pass across the enamel as well as their pressing force: the SimPARTIX team, together with the Fraunhofer Institute for Algorithms and Scientific Computing SCAI, designed an additional software tool to integrate the particle simulation into standard simulation programs. But do the findings correspond to reality? The comparative experiments
Tennis legend Martina Hingis becomes Curaden ambassador

By DTI

KRIENS, Switzerland: Curaden has named international tennis star Martina Hingis its global ambassador. As part of the collaboration, Hingis, who became the youngest Grand Slam champions of all time in 1996 and the youngest world No. 1 in 1997, will help raise awareness about oral health care and promote Curaden’s CURAPROX, Swiss smile and megasmile brands.

Over the next three years, 35-year-old Hingis will make several major appearances in her role as global ambassador for Curaden and CURAPROX at and alongside her sporting commitments as the current leading women’s doubles player, including teaming up with Swiss tennis professional Roger Federer at the Olympics in Rio de Janeiro in Brazil.

Ueli Bretschmid, owner and CEO of Curaden, said: “Martina Hingis is our perfect match – she’s the ideal fit for our company, which operates in over 60 countries. That’s because she’s a mature and credible ambassador who’s famous all over the world. She’s an exceptionally talented sportswoman with a strong personality and great self-reliance who will help us spread the word about our modern kind of oral health care in the best possible way. Together, we want to be the names on everyone’s lips in the future.”

Curaden offers over 120 products under the CURAPROX dental brand, which is sold in 60 countries. Its oral hygiene products are developed and manufactured in partnership with researchers, teachers and practitioners. Based in Kriens near Lucerne, Curaden employs some 300 staff across the world. In 2015, the company generated sales in excess of CHF130 million (€118 million) and manufactured over 28 million toothbrushes.

were conducted by Dr. Andreas Kiesow and his staff at the Fraunhofer Institute for Microstructure of Materials and Systems IMWS in Halle as well as the MikroTribologie Centrum µTC in Karlsruhe. In the tests, a brush bristle was placed in a fastener and brushed at a constant speed across an artificial tooth enamel model onto which toothpaste had been applied. It was concluded that the simulation can precisely predict how the toothpaste and bristles will affect the tooth enamel. At a later stage, it will also be able to predict the effectiveness of the toothpaste and brush at removing the biofilm from teeth.

Abrasive particles are a key component of toothpastes and serve to mechanically remove plaque from the teeth. But a good toothpaste should not be overly abrasive, as over the years the friction can damage the enamel, which does not regenerate. Furthermore, this damaging effect is far more pronounced on the soft dentine. For this reason, the representative body for dentists in Germany recommends that patients with exposed root surfaces choose a toothpaste with a low abrasive effect.

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Company introduces world’s first smart floss dispenser

By DTI

PALO ALTO, CA, USA: For prevention of dental disease, the American Dental Association recommends flossing at least once a day to help remove plaque from interproximal areas that cannot be reached with a toothbrush. However, only a quarter of people use dental floss on a regular basis. In order to address this issue and improve oral health care, a U.S. company has now introduced Floss time, a novel smart floss dispenser. The patent-pending floss time can easily be mounted to the bathroom mirror or wall and automatically dispenses 18 m of floss at the push of a button. After floss has been dispensed, the device starts a 90-second flossing timer in the form of blue-flowing quadrants that move clockwise around the circular light ring, indicating how long the user should floss each quadrant of his or her mouth. Upon completion, floss/time will light up with a blue smile. If not used daily, an orange frown or reminder light cues the user that it is time to floss again.

The device has a single- and dual-user mode and can thus be shared by two people. It can also be individualized using animal snap-ons to make flossing more appealing to children.

The use of dental floss is generally recommended in addition to daily toothbrushing. Insufficient flossing has been associated with an increased risk of caries and periodontal disease, which have been linked to other serious health problems, including cardiovascular disease and diabetes.

Floss time was created by a team of designers, PhDs and engineers. In addition to the device's functional properties, the team paid great attention to its esthetic aspects, such as elegant LED lighting. They believe that their invention will help establish long-term flossing habits. The group is currently raising money for the manufacture of floss/time through the Kickstarter funding platform, which will help finance the first production run.

The funding initiative at Kickstarter ends on Dec. 12 at 4 p.m. (CET).

More information about the dispenser can be found at www.floss-time.com.

Dental caries treatment may prevent pneumonia in Parkinson’s patients

By DTI

KAOHSIUNG, Taiwan/KUALA LUMPUR, Malaysia: Pneumonia is a common condition in patients with Parkinson’s disease. A new study that explored risk factors for pneumonia development has now found that dental diseases were among the most common co-morbidities.

The study included 2,001 participants newly diagnosed with Parkinson’s disease between 2000 and 2009. Over a mean follow-up period of about six years, 39 per cent of the patients were hospitalised for pneumonia. With regard to oral health status, the researchers observed that dental diseases were among the most common co-morbidities. About 48 per cent of the patients in the study had dental caries and over 44 per cent periodontitis. Moreover, the data analysis showed that the incidence of pneumonia in patients who had received treatment for dental caries was lower. They thus concluded that maintenance of good oral hygiene and control of oral biofilm formation reduce the number of potential respiratory pathogens, thereby lowering the risk of pneumonia, especially in elderly men.

The researchers found that older patients, males in particular, patients living in the northern, southern and eastern regions of Taiwan, and patients with lower income had a higher risk of developing pneumonia. For example, over 60 per cent of the participants who developed pneumonia were men. Of the patients hospitalised for pneumonia, about 93 per cent had a monthly income of less than NT$30,000 (US$928).

Pneumonia is a contagious and plays such an important role in our lives that we should make our oral health top priority,” said Dr Nigel Carter, OBE, on the 40th time and held until 16 June, it is aimed at increasing awareness of the importance of oral health by highlighting key messages, such as the benefits of regular toothbrushing and visiting a dentist in order to develop and maintain a healthy mouth.

Thousands of individuals and organisations take part in the initiative every year.

“A simple smile can make others around you feel at ease. It is highly contagious and plays such an important role in our lives that we should make our oral health top priority,” Carter added. “It is an incredibly powerful tool and worth remembering it is one we all possess.”

Smiles in London, York and Liverpool rated best

By DTI

LONDON, UK: Brits may not like to show their smiles very often, according to research, but when it comes to ranking them, most consider Londoners, Yorkers and Liverpoolians to have the nicest smiles. All three cities scored highest in a recent poll commissioned by the Oral Health Foundation as part of National Smile Month.

London may have a reputation for being a place that is very short on smiles but this couldn’t be further from the truth,” remarked Chief Executive of the Oral Health Foundation, Dr Nigel Carter, OBE, on the poll. “It shows that quantity is not always related to quality and when London residents do choose to smile their grins are showing the rest of the country the way forward.”

The survey findings were released on the first day of National Smile Month, the UK’s largest and longest running charity campaign initiative. Celebrated this year for the 40th time and held until 16 June, it is aimed at increasing awareness of the importance of oral health by highlighting key messages, such as the benefits of regular toothbrushing and visiting a dentist in order to develop and maintain a healthy mouth.

Thousands of individuals and organisations take part in the initiative every year.

“arly in the initiative, the team paid great attention to its esthetic aspects, such as elegant LED lighting. They believe that their invention will help establish long-term flossing habits. The group is currently raising money for the manufacture of floss/time through the Kickstarter funding platform, which will help finance the first production run.

The funding initiative at Kickstarter ends on Dec. 12 at 4 p.m. (CET).

More information about the dispenser can be found at www.floss-time.com.

Dental caries treatment may prevent pneumonia in Parkinson’s patients

By DTI

KAOHSIUNG, Taiwan/KUALA LUMPUR, Malaysia: Pneumonia is a common condition in patients with Parkinson’s disease. A new study that explored risk factors for pneumonia development has now found that dental diseases were among the most common co-morbidities.

The study included 2,001 participants newly diagnosed with Parkinson’s disease between 2000 and 2009. Over a mean follow-up period of about six years, 39 per cent of the patients were hospitalised for pneumonia. With regard to oral health status, the researchers observed that dental diseases were among the most common co-morbidities. About 48 per cent of the patients in the study had dental caries and over 44 per cent periodontitis. Moreover, the data analysis showed that the incidence of pneumonia in patients who had received treatment for dental caries was lower. They thus concluded that maintenance of good oral hygiene and control of oral biofilm formation reduce the number of potential respiratory pathogens, thereby lowering the risk of pneumonia, especially in elderly men.

The researchers found that older patients, males in particular, patients living in the northern, southern and eastern regions of Taiwan, and patients with lower income had a higher risk of developing pneumonia. For example, over 60 per cent of the participants who developed pneumonia were men. Of the patients hospitalised for pneumonia, about 93 per cent had a monthly income of less than NT$30,000 (US$928).

Pneumonia is a contagious and plays such an important role in our lives that we should make our oral health top priority,” said Dr Nigel Carter, OBE, on the 40th time and held until 16 June, it is aimed at increasing awareness of the importance of oral health by highlighting key messages, such as the benefits of regular toothbrushing and visiting a dentist in order to develop and maintain a healthy mouth.

Thousands of individuals and organisations take part in the initiative every year.

“A simple smile can make others around you feel at ease. It is highly contagious and plays such an important role in our lives that we should make our oral health top priority,” Carter added. “It is an incredibly powerful tool and worth remembering it is one we all possess.”

Smiles in London, York and Liverpool rated best

By DTI

LONDON, UK: Brits may not like to show their smiles very often, according to research, but when it comes to ranking them, most consider Londoners, Yorkers and Liverpoolians to have the nicest smiles. All three cities scored highest in a recent poll commissioned by the Oral Health Foundation as part of National Smile Month.
Presence of certain oral bacteria may indicate increased pancreatic cancer risk

By DTI

NEW YORK, USA: Researchers have found that the risk of developing pancreatic cancer is associated with specific bacteria in the mouth. They hope that the findings could enable earlier and more precise treatment of the disease, which is one of the most common causes of cancer death in both men and women and results in more than 40,000 deaths annually in the U.S. alone.

Other studies have shown that pancreatic cancer patients are susceptible to periodontal disease, cavities and poor oral health in general. Therefore, the research team at the NYU Langone Medical Center set out to search for direct links between the makeup of bacteria driving oral disease and subsequent development of pancreatic cancer.

The researchers compared bacterial contents in mouthwash samples from 361 American men and women who had developed pancreatic cancer with samples from 371 people of matched age, sex and ethnic origin who did not. They found that men and women whose oral microbiome included Porphyromonas gingivalis, a major contributor to periodontal disease, had an overall 59 percent greater risk of developing pancreatic cancer than those whose microbiome did not contain the bacterium. Similarly, people with oral microbiomes containing Aggregatibacter actinomycetemcomitans, which has been associated with severe periodontitis, were at least 50 percent more likely overall to develop the disease.

“Our study offers the first direct evidence that specific changes in the oral microbiome represent a likely risk factor for pancreatic cancer along with older age, male gender, smoking, African-American race, and a family history of the disease,” said senior investigator and epidemiologist Dr. Jiyoung Ahn.

In another study published last month, Ahn and her colleagues showed that cigarette smoking was linked to dramatic, although reversible, changes in the amount and mix of bacteria in the oral microbiome. However, she cautioned that further research is needed to determine whether there is any cause-and-effect relationship, or how or whether such smoking-related changes alter the immune system or otherwise trigger cancer-causing activities in the pancreas.

The findings were first presented on April 19 at the annual meeting of the American Association for Cancer Research in New Orleans.
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FKG Dentaire SA expands its range of 3D instruments with the introduction of the XP-endo® Finisher R

FKG Dentaire SA continues its marketing of innovative instruments after the introduction of the revolutionary XP-endo® Finisher in 2015. The range of instruments designed for 3D cleaning of the root canal is now enriched by the XP-endo® Finisher R (XP-FR), targeting the removal of filling material.

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Like with the XP-endo® Finisher the exclusive FKG MaxWire™ alloy (Martensite-Austenite) gives to the instrument the ability to expand and contract so as to contact difficult to reach areas, especially in curved and oval-shaped canals.

With its ISO 30 diameter, the XP-FR is slightly stiffer than the XP-endo® Finisher enabling it to eliminate Gutta-percha and sealer.

Moreover, the XP-FR features unparalleled resistance to cyclic fatigue, due to its small core size and zero taper. The instrument is easy to use and intended for all dentists keen to enhance the long-term success of their retreatment procedures.

The XP-FR is available in sizes 21 and 25 mm. Packed in a sterile blister of 3 instruments.

Contact Information
FKG Dentaire SA
Crêt-du-Locle 4
CH-2304 La Chaux-de-Fonds Switzerland
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info@fkg.ch
www.fkg.ch
Getting to the oo.oo point

By Prof. Philippe Sleiman, Lebanon

Anatomy and nature still teach us on a daily basis. Root canal treatment, while it is becoming a routine procedure, surprises and sometimes bad cases still occur. In this article, I will present two unusual case reports from my own practice.

Case 1
The first is a clinical case that in my experience posed rather a challenge. The patient was referred to my office suffering from pain in his right lower third molar on the one side after a root canal treatment had been performed on his mandibular second molar.

The preoperative radiograph (Fig. 1), which was sent by his dentist, showed a well-performed root canal treatment that did not explain the clinical manifestations, but looking closely at the apical part one could observe that the obturation material lay in proximity to the apex of the mandibular canal. Immediate retreatment was required. Unfortunately, the material that had been used was the plastic carrier Thermafil (DENTSPLY), and it was extending into the nerve, causing the inflammation, and the inflammation was causing pressure on the nerve. The Thermafil was removed from the canals—never an easy thing to do—using K3XF files (Sybron-Endo, Fig. 2) and without any solvent in order to avoid any more damage to the nerve in case of leakage. I set the Elements Adaptive Motor (Kerr Endodontics, Fig. 3) to K3XF mode, first using a 25.04 file in the softened part of the gutta-percha with the System B pluggers. I was very careful not to push the carrier further inside the nerve and not to damage the plastic carrier and lose the grip. The second file used was the 25.04 K3XF to remove more gutta-percha and to liberate the carrier.

The instrument was used to hold the carrier and to remove it from the canal (Fig. 4). Once the Thermafil had been removed and the exact working length had been determined using the Apex ID apex locator (Axis, SybronEndo, Fig. 5), the canals were shaped following the SM sequence in TF Adaptive mode to the working length, and used the EndoVac irrigation system (SybronEndo, Fig. 6) with cold physiological saline in order to reduce the inflammation by cooling down the roots. All of the canals were irrigated with the cold saline for at least 20 minutes. The reason I used this technique was to immediately lower the inflammation inside the mandibular canal, which is not well innervated. Reducing the inflammation inside and around the nerve can take a while and I needed to lower it as soon as possible. The canals were kept empty with a cotton pellet inside the access cavity and a hermetic seal on top. I asked immediately for a CT scan (i-CAT, Imaging Sciences International) to be taken in order to study the case. To my surprise, I found that the position of the mandibular canal was different from the contralateral one and that it was in contact with the apex of the second molar where the root canal treatment was performed (Fig. 7). The patient was prescribed anti-inflammatories and kept under observation. Several days later, his lip was normal in function, but there was still some loss of sensibility.

Thirty days postoperatively, another CT scan was taken (Fig. 8) in order to check the inflammation inside the nerve itself, but during this time we continued to irrigate the canals with cold physiological saline at intervals of three days.

Until the patient reported the slow return of sensibility, I decided to seal the canals, and it was for me the moment of truth, since I knew that I needed to seal the canals to the oo.oo point and place a small puff of sealer at the end too. Carefully adjusted master cones were placed inside the canals with a very tight tug back. The correct amount of sealer was applied in order to avoid any excess and gentle warm obturation was performed with the Elements Obturation Unit (SybronEndo). The integrity of the obturation was checked with a CBCT scan (Figs. 9 & 10).

Six months later, a conventional radiograph was performed (Fig. 11) in order to follow up on the case; the patient was doing very well with a completely functional and sensitive lip. The final radiograph showed a sealed root canal space and none of the sealer inside the mandibular canal remained. The conclusion of this case is that we will never know the reason for such a difference in the position of the mandibular canal between the right and left of the mandible, and that we need to respect the oo.oo point of the length of the roots—nothing more and nothing less. And the most important conclusion is that nature and the human body have a truly amazing healing power once the cause of inflammation has been eliminated.

Case 2
In the second clinical case, the patient presented at the office with problems biting on his molar, with a fistula on the buccal side of his mandibular first molar. The preoperative radiograph showed an acceptable root canal treatment performed in accordance with recommendations (Fig. 12).

Studying the radiographs in detail, we could obviously see that something was not right in the apical area of the mesial canals. A closer look indicated some kind of pathology in the coronal part of the distal canal and possibly a cervical resorption or an internal resorption that might explain the fistula in this area.

Again K3XF files were used to retreat the case, with the proper irrigation technique using the EndoVac. A 50.04 file or the ML3 file in TF Adaptive mode was used to shape the last 3 mm of the canals. Adequate master cones were prepared with a very strong tug back placed 0.5 mm short of the working length.

My choice was the Elements Obturation Unit in order to perform the sealing of the root canal system. The choice of the pluggers was made, selecting the largest pluggers to reach 5 mm from working length in each canal, in order to generate hydraulic pressure and to seal in 3-D during the down-pack or the first wave of obturation. Manual pluggers were also adjusted to reach 5 mm and 10 mm from the working length. Medium viscosity was chosen for the cartridge with a large opening and the extruder was set to two arrows or fast injection. The sealer was placed on the cones and inserted into all four...
canals, the first wave of condensation was performed in the canals one after another, and the manual plugger that reached 5 mm from working length was used thereafter in order to control the apical plug. Sealer was placed inside the canal, the preheated cartridge was inserted very slowly with no pressure applied on the needle, since it should reach 7 mm from the working length, 1 mm was injected into each canal, manual pluggers were used to condense this part and final filling of the root canal system was performed also followed by hand plugging. The hydraulic force generated with this technique is sufficient to seal lateral and accessory canals and, of course, the resorption in the distal canal that appeared in the final postoperative radiograph (Fig. 13). The root canal system has a very complex anatomy and this is not often apparent on radiographs. Performing a partial root canal treatment and placing one cone is not the gold standard in root canal treatment. Sealing the root canal system is the final step performed by the endodontist to complete the root canal treatment, but it should be concluded with a hermetic seal on top of it.

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Prof. Philippe Sleiman
Advance American Dental Center
Abu Dhabi and Dubai, UAE
profsleiman@gmail.com

Fig 21 Fig 22 Fig 23

Irrigatys

By DTI

With endodontic treatment, there is the risk of superinfection. The French laboratory ITENA Clinical claims to have solved this problem with its revolutionary Irrigatys handpiece.

This two-in-one device is used for both irrigation and agitation of the cleaning solution inside the root canal. To achieve this, the laboratory put a perforated metal tip at the top of the handpiece to deliver the cleaning solution in an oscillating movement.

A removable tank allows the root canal to be treated successively using sodium hypochlorite and EDTA. The irrigation line directs the cleaning solution through the metal tip.

The patented technology, achieved after six years of research, optimizes the results of a very complex procedure, according to the company. Ambidextrous, light and flexible, the device has excellent ergonomics, providing intuitive handling. Irrigatys recharges on a charging station that can be fixed to the chair.

Irrigatys is available with all of its accessories in a starter kit. The metal tips are available in two sizes, 17 mm and 21 mm, to cover all clinical cases.

Fig 11 Fig 12 Fig 13

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The story behind IPS POWER

By Alham Farah, Syria

IPS e.max® Ceram The versatile layering ceramic is optimally coordinated with the materials of the IPS e.max System. Matching the shade when using different framework materials is clearly facilitated by the universal layering diagram and the precise shade coordination. After all, the veneering ceramic is the key to highly esthetic results within the IPS e.max System – both on lithium disilicate (LS2) and zirconium oxide (ZrO2) – particularly for the adaptation to the natural model. The unique combination of translucency, brightness, and opalescence leads to natural light scattering and a balanced relationship between brightness and chroma (Fig. 2).

At the beginning of the all-ceramic era, both lithium disilicate and zirconium oxide were only available with medium or high opacity. These opaque framework structures reflect a lot of light, which increases the brightness of the fabricated restoration. The conventional IPS e.max Ceram Dentin and Incisal (Fig. 3) materials are exactly adjusted to this effect and are thus optimally suitable for use on opaque substructures. The balanced relation between brightness and chroma results in the exact match with the respective shade guide (Fig. 2).

Frequently Asked Questions
Why POWER dentin & Incisal initially developed?
Mainly because of two factors that raised over the past few years. (Fig. 4)
1st: The continuous development of more translucent all-ceramic framework materials
and the general trend of patients’ desire for brighter restorations in the overall.

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A shade comparison between IPS the e.max ceram incisal (I) & IPS e.max ceram POWER Incisal (PI)
How does it affect restorations?
With the modern translucent substructures less light would reflect, what reduces the brightness of the fabricated restoration. To counteract this effect, IPS e.max Ceram “Power Dentin” and “Power Incisal” materials were developed (Fig. 5).

Where is IPS Power Dentin from Deep Dentin?
Deep Dentin is basically developed to enhance the Chroma dimension of a shade, and subsequently increases opacity and value of the ceramic restoration, whereas Power Dentin is developed to enhance the Value dimension of a shade in the first place, and indirectly and slightly increase the chroma of a ceramic restoration.

What is the change needed on the layering diagram after POWER?
No change is required on the familiar layering diagram. Power dentin is additional optional layer, just like Deep dentin, but deep dentin enhance the chroma, while Power dentin enhance the value, so it can be:
1. either placed buccally as an intermediate layer between the frame and the Dentin layer, and especially in the cervical third where build up ceramic at its maximum thickness.
2. or used instead of Dentin, for complete body build up.

In what case scenarios IPS POWER is recommended? (Fig. 6,7)
1. patient cases when translucent frameworks are used, like ZenoStar (T or MT) zirconium oxide (ZrO2) or lithium disilicate (LS2) IPS e.max (LT or HT)
2. patient cases when natural teeth clearly exhibit greater brightness.
3. patient cases when we have a thick space buccally, or extremely thin space buccally, to layer on with IPS e.max Ceram.
4. patient cases when natural teeth which need to be shade-matched exhibit high fluoracence, what’s visually interpreted as higher value effect.
5. patient cases when Bleach colors of final restoration is required, Power bleach dentin & Incisal range exhibit higher value and subsequently higher bleach color stability.
6. patient cases when more light-from the inside out- required for the restorations, knowing that intracoronal is a dark cavity, and slightly brighter restorations are always recommended to compensate the lack of light inside the mouth where restorations will end up after cementation. Fig 7.
7. patient cases when stumps (prepared tooth) are not vital and exhibit discoloration

What are the delivery forms of IPS Power?
IPS e.max Ceram Power Dentin (PD) materials are available in all A – D shades and 4 Bleach BL shades. The IPS e.max Ceram Power Incisal materials are available in 4 shades. Note in (Fig. 8,9) a comparison in few shades and incisals between before/after IPS Power.

Contact Information
Ivoclar Vivadent AG
Bendererstrasse 2
9494 Schaan/Liechtenstein
Tel.: +423 235 35 35
E-mail: info@ivoclarvivadent.com
www.ivoclarvivadent.com
DAC UNIVERSAL: 10 Years of Maximum Hygienic Safety

For 10 years, Dentsply Sirona Instruments has satisfied the most stringent hygiene requirements imposed on dental practices with the DAC UNIVERSAL combination autoclave. Now, the addition of the new FLEX lid extends the requirements profile for the device and closes the hygiene gap in mechanical reprocessing.

By Dentsply Sirona

BENSHEIM/SALZBURG: After acquiring the hygiene division of Danish company Nitram 10 years ago, Dentsply Sirona continued developing the DAC UNIVERSAL combination autoclave to create a reprocessing device with validation processes for handpieces in dentistry. By 2006, the Robert Koch Institute (RKI) recommended that medical devices be reprocessed only with suitable, validated procedures to prevent infection. This prompted Dentsply Sirona Instruments to document the autoclave’s reprocessing procedures so that the technical and hygienic operation of the device, as well as its processes, can be tested and validated. As a result, dentists and their teams can practice safe dentistry.

“The technology of our DAC UNIVERSAL complies with the most stringent requirements, so we can offer dentists greater legal certainty,” says Eric Berndt, hygiene product manager at Dentsply Sirona Instruments, referring to the tougher demands for compliance with hygiene guidelines imposed by the health authorities. Simultaneously, the capacities of practice teams and the space they have in many reprocessing rooms are limited; therefore, the equipment required for mechanical reprocessing should be simple, effective, safe and usable with verifiable results for many different instruments.

Unsurpassed hygienic safety with the DAC UNIVERSAL

Compared with other reprocessing methods, the DAC UNIVERSAL offers not only process safety but significant time advantages as well, because it is the only device on the market that can clean, lubricate and sterilize up to six turbines, and straight and contra-angle handpieces in 16 minutes. Using this device, instruments are quickly ready for use again, which lowers the dentist’s investment cost in handpieces. Additionally, no chemical additives are used during the cleaning process, which is beneficial for the working life of the instruments.

For IDS 2015, Dentsply Sirona Instruments expanded the reprocessing capabilities of the combination autoclave to include more instruments. With the new FLEX lid on the DAC UNIVERSAL, the device can now be used for internal and external cleaning, thermal disinfection of ultrasonic tips and handpieces as well as the nozzles of multifunctional syringes. The STANDARD lid can be used for cleaning, maintaining and sterilizing up to six wrapped handpieces, or a wire basket makes it possible to reprocess solid instruments such as probes, mirrors or curettes. The ultrasonic tips are reprocessed together with their associated torque wrenches and undergo a closed, fully automated hygiene cycle so that sources of error are excluded. Various adapters also make it possible to reprocess instruments from other manufacturers in the DAC UNIVERSAL. Yet another advantage is the graphical user interface that enables simple, intuitive operation. The current status is shown in the LCD display throughout the hygiene cycle. All-important reprocessing parameters and confirmation of successful completion of the program can be documented after the cycle ends.

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T he D e n t a l C o m p a n y
Implant uncover with the Picasso diode laser

By Gregg M. Kurtzman, DDS, MAGD, DICOI, DADD

Introduction

Dental implants are placed either utilizing a 1-stage approach (healing abutment placed at implant placement) or a 2-stage approach (implant is covered by soft tissue at time of placement) and modification of the soft tissue to expose the implant fully may be required. When the prosthetic phase is initiated, soft tissue to either removed to uncover the implant or reshape the gingival margin for better esthetics which can be accomplished by several methods. A cutting instrument (ie. Scalpel or tissue punch) has been the traditional approach to incise through the soft tissue to the underlying implant. The result is a bleeding edge that can interfere with impressions if they are to be taken at the same appointment. Additionally, post-operative sensitivity has been reported and can result from the fresh cut edge. Typically a delay of 2 weeks or longer can result from the fresh cut edge. It is advised to use the lowest wattage at a setting of 0.8-1.0 watts in a continuous mode is usually sufficient. A 400 micron diode tip (orange) is utilized for oral and periodontal surgical applications such as Laser Assisted Periodontal Treatment (LAPT).

Beyond the carbonization zone, an area of hemostasis (coagulation) occurs. Typically sites treated with the diode laser will demonstrate little to no bleeding depending on the condition of the tissue prior to treatment. Tissue that is hemorrhagic will require longer contact with the diode laser to achieve coagulation and may occur due to the inflammation present prior to laser treatment. The coagulation affects and lack of post treatment tissue shrinkage allow immediate implant impressions should be desired.

The laser also creates an area of biostimulation adjacent to the coagulation area. Tissues and cells following irradiation with a diode laser, have a

![Figure 5: When minimal keratinized gingiva is present, the diode laser is utilized to make an incisonal distal mesially and the tissue is spread so it covers all of the attached gingiva present.](image)

![Figure 6: Buccal view of the anterior maxilla demonstrating preservation of the papilla due to the provisional bridge.](image)

![Figure 7: Occlusal view of the anterior maxilla demonstrating preservation of the papilla due to the provisional bridge.](image)

![Figure 8: Picasso diode laser removing soft tissue to uncover the implants cover screws.](image)

![Figure 2: Companion of the depth of affected cells with an electrosurgery unit and a diode laser](image)

![Figure 3: Tissue reaction upon contact with an initiated diode laser tip demonstrating the effect as one moves away from the tip](image)

![Figure 4: Implant to be uncovered (A) presents with two options depending on width of attached gingiva available. Wide band of attached gingiva will remain after removal of tissue over cover screw, the diode is utilized in a spiral pattern starting at center until fully exposed (B). Narrow band of attached gingiva presents elliptical cut is made with the diode and tissue is pushed buccally and lingually to preserve the attached gingiva (C).](image)

![Figure 1: Picasso Diode Laser (AMD Lasers) which improves initial healing. To expose the soft tissue covering the implants cover screw or resharpen the tissue for esthetics a setting of 0.8-1.0 watts in a continuous mode is usually sufficient. A 400 micron diode tip (orange) is utilized for oral and periodontal surgical applications such as Laser Assisted Periodontal Treatment (LAPT).](image)
biostimulatory effect that provides faster or more favorable wound healing. 

When a wide band of attached gingiva is present and sufficient amount of healthy tissue is present after uncovering on both the buccal and lingual then the diode laser is activated and inserted at the center of the site and worked in a spiral pattern outward until the entire cover screw is exposed (Figure 4G) a cutture or other instrument may be necessary to loosen the tissue over the cover screw as the peristomalium during implant healing becomes adherent to the titanium cover screws. Sites that present with a narrow width of attached gingiva of 3mm at the crown center will require some conservation of the remaining attached gingiva. In this clinical situation, the diode is utilized to remove an elliptical piece of soft tissue over the cover screw and then the tissue is pushed buccally and lingually to preserve the attached gingiva (Figure 4C). If less attached gingiva is present on either side of the center the practitioner will need to preserve all of the attached gingiva present and a conventional flap is recommended to be able to position the tissue in a more apical direction. When this is necessary incisions can be made with the diode laser as an alternative to a scalpel (Figure 5).

Case report

A 40 year old female patient present with severely malposed maxillary central incisors tipped facially and a desire for esthetic improvement. A DCT was taken and noted minimal bone was present over the facial of the central incisors. Options for treatment were presented to the patient which included orthodontics to correct aesthetics or extraction of the central incisors, placement of implants at these sites and restoration on the anterior teeth. The patient indicated that she did not wish to pursue any orthodontic treatment option due to the time involved.

The patient presented for surgery and the central incisions wereatraumatically extracted under local anesthesia: the adjacent teeth were prepared for crowns, which would support a provisional bridge during the healing/integration period. A 4mm wide 24 degree Co-Axis implant (Keystone Dental, Burlington, MA) was placed into the osteotomy at each central incisor orienting the prosthetic axis to a vertical position because of the variation in the direction of the premaxilla. A healing screw was placed and exposed in the proximal area of the crown. Prior to placement the crown was positioned on the facial of the implant to thicken the resulting bone. The soft tissue was closed with resorbable PGA sutures. A stent created over the way of the study models that had been modified was filled with an autoc𝑢re provisional resin (Perfectemp 10, DenMat, Los Gatos, CA) and sealed over the anterior and allowed to set. Upon setting the stent with provisional resin the stent was carefully trimmed and polished. The material at the implant sites was shaped to form an emergence profile in the soft tissue and preserve the papilla.

Six months post implant placement the provisional bridge was removed and preservation of the papilla was confirmed with a natural emergence profile within soft tissue (Figure 6). The local anesthetic was administered. The Picasso diode laser was set at 4.5 watts in continuous mode with an initiated tip and at the center of the depressions in the soft tissue above the implants cover screw and moved in a circular motion moving outward until the entire cover screw was exposed (Figure 7). The process cut the desired soft tissue and coagulated any bleeding from the edges. This was then repeated on the second implant. Open tray implant impression abutments were placed into the diode laser (Figure 8) and the provisional resin and impression were removed. An impression of the maxillary arch was taken utilizing Aquasil heavy body VPS (Cauf, Milford, CT) and placed in a Hera Advanced Impress material tray (Hager World wide, Hickory, NC) and Aquasil Ultra springform around the preparations and implant abutments. An articulating paper was placed into the implants (Figure 9). The previously placed provisional bridge was tried in and modified at the pontics to allow the bridge to fully seat over the healing abutments and luted with a provisional cement (Sugi Temp LT, C.O. America, Aliso, CA).

Two weeks later the prosthesis returned from the lab (Dental Labs, Lompoc, CA) and the provisional bridge was removed. The healing abutments were removed and the soft tissue was removed a lack of inflammation and a good periodontal health where it had been modified by reducing the ceramic crowns were tried on in teeth 7, 10 and 14 and the screws returned zirconia based implant crowns inserted. A radiograph was taken verifying fit of the implant prosthesis. A torque wrench was utilized to tighten the fixation screws on the implants to 40 Ncm and the ceramic crowns were luted with Panavia 5a resin cement (Kuraray, NY, NY). Occlusion was checked and adjusted where needed.

Conclusion: Diode lasers are a useful adjunct to soft tissue modification to uncover dental implants or esthetically re-contour the gingival margin. They provide better safety than electronic surgery maintaining temperature profile within the safety zone of bone and do not cause tissue shrinkage that can affect the esthetic outcome. As the diodes tip provides simultaneous cutting and coagulation (hemostasis) a clear advantage to the use of a scalpel or tissue punch immediate impressions can be accomplished without site bleeding affecting the accuracy of the capture of the soft tissue contours and position.

References


The full list of references is available from the publisher.

Dr. Kurtzman

Study finds fundamental misconceptions about dental implants among patients

By DTI

HONG KONG, China: Investigating patients’ knowledge and perceptions regarding implant therapy, a Chinese study has found that an alarming number of participants had inaccurate and unrealistic expectations about dental implants. Moreover, the study determined that only 18 per cent felt confident about the information they had about the treatment.

In the study, the researchers investigated preoperative information levels, perceptions and expectations regarding implant therapy via a questionnaire. Responses from 277 patients were obtained during 2014 and 2015 in three different locations in China (Hong Kong, Sichuan and Jiangsu).

The analyses established that about one-third of the participants had mistaken assumptions about dental implants. According to the researchers, common misconceptions were that dental implants require less care than natural dentition, implant treatment is appropriate for all patients with missing teeth, dental implants last longer than natural dentition, and there are no risks or complications with implant treatment.

Overall, younger respondents (< 45) and those with higher education (bachelor’s and postgraduate degrees) tended to have more realistic perceptions and lower expectations of the treatment outcome.

When asked about their level of knowledge, 63 per cent of the participants said that they were generally informed about implants, but only 18 per cent felt confident about the information they had.

The study, titled “What do patients expect from treatment with dental implants? Perceptions, expectations and misconceptions: A multicenter study”, was published online ahead of print on 23 March in the Clinical Oral Implants Research journal.

Although dental implants are gaining increasing popularity, patients’ are often insufficiently informed and their perceptions unrealistic, a study has found. (Photograph: AnnaMoskvina/Fotolia)
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