Thailand wins bid for FDI Annual World Dental Congress, 2015 edition to be held in Bangkok

ISTANBUL, Turkey: For the third time in five years, the Annual World Dental Congress of the FDI World Dental Federation will be held in an Asian country. An agreement between the Geneva-based dentists’ organisation and the Dental Association of Thailand (DTA) to organise the 2015 congress in Bangkok was signed recently at the 2013 FDI AWDC in the Turkish capital. Dental Tribune Asia Pacific has learned.

It will be the first time that the South-East Asian country will host the prestigious international dental event. According to DTA President Dr Adirek S. Wongsa, who spoke to Dental Tribune briefly in Istanbul, his organisation has bid to host the congress in Thailand each year since 1999. It will be a unique event that will not only highlight the rapid development of dentistry in Thailand, but also bring all professions in dentistry together, he said. Preparations have already commenced and more information will be released in the upcoming months.

The congress in Bangkok will follow the 2014 edition, which is being organised by the Indian Dental Association and hosted in New Delhi. The organisation’s most recent congresses in Asia were held in Hong Kong and Singapore. The Korean Dental Association won the bid to organise this year’s congress in Seoul in South Korea but the event there was cancelled, and hosted instead by the Turkish Dental Association last month in Istanbul.

The DTA is organising its own annual dental event, the Thailand International Dental Congress, to be held in November this year.

According to Wongsa, the event attracts around 5,000 dental professionals each year. The Kingdom of Thailand currently has a workforce of 12,000 dentists.

Dental Tribune expands to Israel

With its new Israeli partner, the Dental Tribune International Group will soon be providing dentists with the latest news from the region and worldwide in Hebrew. The Dental Tribune-Israel office will be run by Danom Technologies, a local distributor of dental equipment, such as Fotona lasers, that was founded in 2004. The first print edition will be made available in October during the Israel Dental Association meeting. A local website will be launched in September.

Currently, Dental Tribune International’s combined portfolio includes more than 100 trade publications that reach over 650,000 dentists in more than 90 countries and 25 languages.

More people hospitalised

Hospitalisations due to preventable oral infections may be on the rise. Reviewing national patient data, US researchers have found that the number of people hospitalised for dental abscesses, a common consequence of untreated tooth decay, has increased significantly over the last decade.

Sleep apnoea linked to glaucoma

A study in Taiwan has shown that sleep apnoea is associated with the risk of developing glaucoma, one of the main causes of blindness. Overall, 1.67 times more participants with obstructive sleep apnoea developed open-angle glaucoma within five years compared with controls, according to the report.

Teeth grown from urine

A team of Chinese researchers has managed to engineer tooth-like structures from human urine-induced stem cells, which could be used to regenerate patient-specific dental tissue or even whole teeth. They used nine distinct lines of pluripotent stem cells derived from the urine cells of three donors. Combined with dental mesenchyme, these cells were then transplanted into mice. After three weeks, the researchers observed the formation of tooth-like structures possessing the properties of human teeth. Overall, they reported a 50 per cent success rate for tooth regeneration.

Adult dental stem cells have been used in tissue engineering research successfully. However, the absence of consistent sources of dental epithelial stem cells with odontogenic potential in adults is a major limiting factor of tooth regeneration from these cells. Thus, autogenic pluripotent stem cells induced from human urine could be an alternative. In the future, bioengineered tooth germs created from stem cells could be cultured in vitro and transplanted into a patient’s jawbone to form a fully functional tooth, they said.

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Health issues prevalent among female FDWs

New report highlights problems of migrant workers in Asia

FDWs in 11 different countries between 1995 and 2010, investigated health problems related to adverse working conditions, mental health and infectious diseases. Studies on knowledge and attitudes towards health were also reviewed. According to the scientists, the results indicate that more research into the occupational health hazards and health of FDWs is needed. They noted however that working conditions have improved slightly through new legislation in countries like Singapore, where some of the largest numbers of female FDWs are employed.

“As the demand for domestic help rapidly increases in the developed world, migration of labour from the less developed to the more advanced economies will only grow. Given the critical economic role FDWs play by contributing vital foreign remittances to the economy, labour-sending countries have a vested interest in easing the migration process. Hence, ensuring the safety and health of FDWs should be important to both the host and labour-sending countries,” the report states.

Owing to economic development, demand for domestic workers has increased by 50 per cent over the last 15 years, according to labour organisations. Besides Singapore, Hong Kong and Taiwan are currently the countries with the largest numbers of FDWs.
Dentistry is still largely a profession focused on treatment rather than prevention of oral diseases like caries or periodontal disease. A preventive approach in dentistry is needed more than ever, according to FDI Continuing Education programme director for the Asia-Pacific region Dr William Cheung.

Dental Tribune Asia Pacific: Dr Cheung, could you please summarise the key aspects of the preventive philosophy and why it is important?

Dr William Cheung: I think in the mind of most dental practitioners, prevention means primarily brushing, flossing and regular cleaning. There is no question that these measures are important but there is a lot more to this, like all the developments in the area of fluoride, for example. Many dentists are not aware of that.

There is also carries management by risk assessment, where we sit down with the patient and go through a certain process step by step. With the outcome of this, we can identify certain areas that need special attention. Then we formulate a protocol for this particular patient for managing his or her risk, or minimising it. This is not necessary for every single patient but if we expect the patient to be highly susceptible to caries then we would go through this exercise and perform a risk assessment.

Such a model clearly benefits the patient. What is in it for the dentist?

Patients sense that you have a preventive approach at your practice and actually notice that you are going through all these exercises for them. This creates a positive image for the practice.

As dentists, we gain greater satisfaction because we can see the result of introducing this type of approach to patients that will subsequently be of benefit to them. By having patients come in regularly, you can identify something and can offer choices rather than expecting patients to come in only once they have a problem. When you start to build this kind of positive image and patients are happy, they are going to refer patients to you. Referred patients are the best patients in my opinion.

Considering all the prevention-focused initiatives that organisations like the FDI are running, where do we stand with the preventive model?

Unfortunately, at a congress like the FDI AVDC here in Istanbul, most dentists want primarily to attend presentations in fields like cosmetic dentistry and implants. Those are the major topics that they are interested in, and do not blame them because implants can generate a lot of revenue.

As dental professionals, however, I think we owe it to our patients to adopt a preventive philosophy. If we do the right thing, it can be rewarding as well financially. So, if you ask me when we are going to reverse this trend, I do not have an answer for you but as a dental association it is our responsibility to teach prevention and ensure that dentists understand what that means.

Thank you very much for the interview.
Dear reader,

The FDI’s recent decision to hold yet another of its annual congresses in an Asian country is good news for dentists in the region, not necessarily because it will significantly advance dentistry there, but because it will offer the international dental community a window to the latest achievements in the region to date. Particularly in Thailand, where the 2015 congress will be hosted, the quality of oral health care services has made a huge leap, fuelled by dental tourists who demand state-of-the-art treatment at lower costs. On the other side, an enormous gap in access to dentistry still exists between the major cities and the countryside, where only a fraction of people are able to visit a dentist regularly. For discussions about these issues and finding solutions to them, the FDI congress will be an important platform. I hope to see you also in New Delhi in 2014, which will be hosted, the quality of oral health care services has also made a huge leap, fuelled by dental tourists who demand state-of-the-art treatment at lower costs.

Yours sincerely,
Daniel Zimmermann
Group Editor
Dental Tribune International

The concept of minimum intervention in dentistry (MID) ranges from early diagnosis of oral disease to appropriate intervention, which includes prevention, control and treatment for the purpose of conserving natural teeth and periodontal structures. A number of MID measures have recently become available, including the very early detection of dental caries using Quantitative Light-induced Fluorescence (QLF). Moreover, the virtual FDI Caries Matrix, in terms of non-cavitated and cavitated lesions in enamel and dentine, has been proposed as a caries index for timely prevention and treatment.

For caries restoration, partial caries removal during cavity preparation has been suggested, which, according to research, appears to reduce the incidence of intracoronal pulp exposure and therefore the risk of pain and infection. Simplified and modified atraumatic restorative treatment, a further development of atraumatic restorative treatment (one of the original MID methods of restoration) and a preventative method of restoration for primary teeth that entails partial caries removal and filling with encapsulated self-curing glass ionomer cement, has been proposed. This concept makes preventive restoration in preschool children, even by trained dental auxiliaries, possible. Moreover, effective use of self-cure fluoride toothpaste during toothbrushing has been suggested for every age group, especially the correct minimal amount of toothpaste used in children to prevent both caries and fluorosis.

There are several interesting MID measures in terms of periodontal disease, such as non-surgical or minimally invasive surgery in periodontal therapy, and single- or flapless implant surgery. The effectiveness of the buccal single-flap approach for surgical debridement of deep intrasusal defects has been shown to be comparable to the double-flap approach in terms of clinical attachment level gain, probing pocket depth reduction and minimal gingival recession, six months post-surgery. Another method is flapless implant surgery conducted with help of the tissue punch technique instead of having to raise a mucoperiosteal flap. Reports show that this reduced operational time, accelerated post-surgical healing and even increased patient comfort in some cases.

Dental Tribune welcomes comments, suggestions and complaints at newsroom@dental-tribune.com. For quick access to our contact form, you may also scan the following QR code.
Dental professionals in Europe targeted by perio awareness campaign

MONACO/MADRID, Spain/CHICAGO, USA: Periodontal disease is a major public health issue that should be addressed increasingliy by the medical and dental communities, the European Federation of Periodontology (EFP) and the American Academy of Periodontology (AAP) have stated in a joint manifesto, in order to convey this message to more dentists, the EFP recently launched an international awareness campaign aimed at more than 500,000 professionals in Europe.

Kicked off at the recent international symposium of the Swiss Osteology Foundation in Monaco in May, the Outreach Campaign aims to highlight both the relationship between periodontal and systemic diseases, as well as the importance of periodontitis prevention. According to the manifesto, which has been available on the organisation’s website since March, there is convincing evidence from a large number of studies that periodontitis may increase the risk of developing diabetes or cardiovascular disease, and may lead to adverse pregnancy outcomes, such as preterm birth or low birth weight. Other systemic conditions such as rheumatoid arthritis or certain kinds of cancers are also thought to be influenced by periodontal inflammation.

In light of this evidence, dental professionals will have to fundamentally change the perception of their responsibilities as providers of general health, the manifesto states. Multidisciplinary approaches through collaboration between dental and medical communities, as well as within the dental communities, will have to be developed further to meet future patients’ needs.

The content of the manifesto is based on recommendations made during a joint EFP/AAP workshop, which took place in Spain in November last year and drew 80 experts in the field. The workshop was held under the leadership of Prof. Mariano Sanz from Spain, Maurizio Tonetti from Italy, and Niklas Lang from the University of Hong Kong’s Faculty of Dentistry. Among other measures, it recommends thorough periodontal evaluation of patients presenting with signs of systemic diseases by dentists. It also calls for more clinical trials and studies researching the effects of periodontal therapy on several disease factors in different populations in order to obtain additional reliable scientific data on these issues.

Besides the manifesto, the campaign will provide information through regularly updated online dossiers, video documentaries and other promotional activities. A seven-minute clip was presented to the public in Monaco and is already available on video-sharing platforms like Youtube.

In addition to the EFP member associations, the campaign has received support from dental consumers’ provider Colgate-Palmolive’s GABA and other professional dental bodies. Owing to these partnerships, the campaign will be presented at most of the national member events throughout the year, the organisation said. More information about the Outreach Campaign is available on a dedicated website at periosworkshop.efp.org.

The EFP currently consists of 26 national periodontal associations that boast a combined membership of over 17,000 professionals. Besides publishing the Journal of Clinical Periodontology, it hosts the triannual EuroPerio congress. The next edition of this event will take place in London in 2015.
EDMONTON, Canada: Dr Michael Zuk, the Canadian dentist who bought one of John Lennon’s molars for US$50,000 at an auction almost two years ago, has partnered with a laboratory in the US to extract the musician’s genetic code from the tooth.

“I am nervous and excited at the possibility that we will be able to fully sequence John Lennon’s DNA, very soon I hope. With researchers working on ways to clone mammoths, the same technology certainly could make human cloning reality,” Zuk said.

Further details of the research project are still being kept confidential. Zuk told Dental Tribune that he had asked the scientists to halt any procedures until the interest of a film crew to document each step has been secured.

In the 1960s, the famous John Lennon gave the tooth to his housekeeper, whose family auctioned it in November 2011. The tooth has appeared in a number of media reports and television documentaries since then. Last year, Zuk partnered with celebrity jeweler Ari Soffer to design three John Lennon DNA pendants valued at US$25,000 each. Within the scope of a mouth cancer awareness campaign, one pendant was sent to a group of dentists in the UK who were offering free mouth cancer screening. With his blog “The Un-Cosmetic Dentist”, Zuk is also a regular contributor for the Dental Tribune website.
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Becoming one of the top five manufacturers of dental materials in the world

An interview with Mitsui Chemicals Executive Vice-President Minoru Koshibe in Japan

In a surprising move, German precious metals group Heraeus sold its dental business to Mitsui Chemicals in April. Recently, Dental Tribune Japan had the opportunity to visit the company’s headquarters in Tokyo and sit down with Executive Vice-President Minoru Koshibe to talk about the reasons for the acquisition and the reasons his company, which specialises in chemicals and plastics manufacturing, sees its future in the dental field.

Dental Tribune Japan: Mr. Koshibe, economic growth in Japan has been slow in recent years. Was this one of the major reasons for the Heraeus acquisition?

Minoru Koshibe: As a diversified chemicals company, 70 percent of our business comes from the manufacturing of chemicals, including petrochemicals. For this reason, we are naturally affected by macroeconomic changes like rising oil prices. After the Lehman Brothers bankruptcy and the harsh economic conditions that followed, we no longer perceived a future of growth and continuity, so we decided to move our corporate direction to areas that would be less affected by economic cycles, such as health care.

Although we originally operated in the medical field, we were not able to advance immediately in that business because we sold this segment very early on. However, we subsequently started to develop monomer optical lenses, which gained a huge market share in Japan. With Sun Medical as our next business venture, we planned to expand operations to a worldwide level. Unfortunately, we soon realised that this would probably take 20 to 30 years, so we finally decided to take the plunge and acquire a company with a global foothold in the dental materials market.

Had you been looking into other companies, and what factor made you decide on Heraeus over all available options?

We made a list of the top ten manufacturers of dental materials in the world and narrowed it down to a few companies after having reviewed them from various perspectives. For our envisioned global expansion, Heraeus seemed to be the best choice, also because the company was constantly trying to expand its reach into dental CAD/CAM, which is a new business segment, for which extraordinary growth in the future is anticipated. Had Heraeus not had such a digital services division, I guess we would have had to acquire another company, but the company’s existing foothold in the CAD/CAM business was a decisive factor. Therefore, it was also the first company we contacted.

“What outcomes do you expect from the acquisition for your domestic dental business?”

We want dental materials to become the core of our overall business. Since Sun Medical is much smaller than Heraeus, we decided to establish our dental materials head office in Germany, which started operations in April. From there, Sun Medical has not met our expectations in the past. Despite the difficult market environment, we still want to expand our sales channels in Europe and North America.

Heraeus has significant market share in the European and North American dental markets. Do you intend to increase your reach there in particular?

With the bonding agent Super-Bond as key product, we have been operating through Sun Medical in North America and Europe already, but sales there has not met our expectations in the past. Despite the difficult market environment, we still want to expand our sales channels in Europe and North America, as these are the most important markets for materials with higher price points.

In order to achieve this, we aim to integrate our technologies with Heraeus Kulzer’s sales channels. Dental materials have shifted to composite resins and hybrid new materials that meet various aesthetic requirements, and we intend to create a synergy in making the best possible use of our polymer technologies for the new digital services. Methyl methacrylate is certainly the gold standard at the moment, but we want to develop dental materials with new polymers. We believe the key technology for achieving this will be CAD/CAM and 3-D printing.

“Despite the difficult market environment, we still want to expand our sales channels in Europe and North America.”
Ultradent highlights products for restorative dentistry

Ultradent’s original knitted cord, Ultrapak, was developed for providing rapid tissue displacement, detailed margins, and quality impressions. It compresses upon packing and then expands for optimal retraction. Through its knitted structure, it remains in place better than any twisted or braided cord, according to the company. Ultrapak CleanCut has a high carbon-steel blade in the cap for ultimate convenience, while the dispensing orifice prevents the cord from falling back into the bottle upon cutting. For easy measurement of the cord length, it has a ruler printed on the label.

The company also offers a glycol-based caries indicator called Sable Seek that stains carious dentine even in difficult-to-see places, such as under overhanging enamel of Class I, II, or III preparations, dark green. Through the removal of this non-mineral dentine, the bond strength of the entire restoration can be improved significantly. Precise and mess-free delivery is provided through a syringe delivery system.

How will your company influence business decisions at Heraeus, and how do you evaluate the company’s position in dental markets right now?

“We want to expand the scope of dental materials through technological innovation...”

Although they have a strong presence in the North American and European markets, their market position in Asia is not very significant. On the other hand, we are a strong force in Japan and South-East Asia, and thus have more information on markets like Thailand, Indonesia and Malaysia. We believe that with the right marketing, the Heraeus brand can be successfully expanded in that region. Our company and Heraeus Kulzer complement each other’s strong and weak points well.

Decisions at Heraeus will be made within the management resources of the entire Mitsui Chemicals Group. Heraeus is a wholly owned subsidiary, which means investments will be under our control and implemented with consideration of the overall balance sheet. As we do have a management strategy to shift our positioning towards the health care business, people at Heraeus can expect us to make good use of our management resources and give high priority to this field when it comes to investments in the future.

You also acquired shares from DENTCA, a US denture manufacturer, recently. Are you currently looking into opportunities to acquire other dental companies?

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It’s all about the matrix

Prof. Dilek Tagtekin

During the past decades, restorative treatments in dentistry have changed remarkably. Growing interest in aesthetic restorations in the posterior region and the alleged adverse health effects and environmental concerns regarding the release of mercury gave rise to controversial discussions about the use of amalgam in several countries. Along with the introduction of new and improved resin materials that offered adhesive properties and the principle of minimal invasive interventions, this has led to a change from the use of amalgam towards the use of composite resins in posterior teeth.

Restoring a Class II preparation with composite resin can be challenging. Open contacts, poor anatomical contour, and an inadequate marginal seal are just some of the problems that clinicians have to deal with. Initially, these issues can be linked in part to the use of amalgam matrix systems.

The ideal matrix system creates a tight interproximal, anatomically correct contact with minimal flash and a seamless marginal seal. It has been shown that composite resin provides little internal force to counteract the force from the matrix. Therefore, unlike amalgam, which has a very high resistance to deformation, composites are easily forced back into their original position by a tight circumferential matrix band, thus resulting in open contacts.

This problem is the result of several factors, including that composite cannot be condensed like amalgam, which leads to an insufficient adaptation of the matrix towards the adjacent tooth, the polymerisation shrinkage of the composite material and the effects on tooth position owing to the elastic behaviour of the rubber dam.

Proximal contact plays an important role in the stomatognathic system. Inadequate contact may result in food impaction and lead to periodontal disease and tooth movement. Researchers have sought to overcome these problems by improving material characteristics and application techniques. The choice of matrix systems and separation techniques is an important factor. In order to improve the proximal contacts, instruments were designed to allow the tightening of contact during curing. Other techniques advocated the use of cured composite or ceramic inserts that would provide predictable contacts and proper physiological contour. Heavy-bodied composites were introduced in an attempt to mimic the handling characteristics of amalgam and create more favorable contacts.

However, researchers have demonstrated that it is the matrix system and not the handling characteristics of the composite that determines a favourable contact. Composite resin is a technique-sensitive material that requires its own unique matrix system.

In response to these frustrating clinical problems, the sectional matrix and contact ring matrix retainers were developed, providing significant improvements to previous devices. In modern dentistry, traditional circumferential matrix systems are very popular, but they have shortcomings with regard to their improper proximal matrix form and establishing tight proximal contacts. The circumferential matrix systems showed significantly looser proximal contacts in studies on Class II cavities, which might be explained by the thickness of the matrix when placing a two-surface restoration.

In recent in vitro and in vivo studies, sectional matrix systems in combination with separation rings were proved to generate proximal contacts with a reliable tightness in two-surface Class II cavities. The use of a sectional matrix system for two-surface Class II cavities resulted in significantly tighter proximal contacts than the use of the circumferential matrix systems did.

Contact Info

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Understanding e.max as the ideal material for indirect posterior and anterior restorations

Dr Kenneth Malament
USA

Posterior restorations are among the most frequently performed treatments in dentistry today, yet various challenges and limitations still exist in their execution. Whether for cases involving full coverage, partial, implant-supported, or aesthetic restorations, the process of selecting the appropriate material for indirect posterior treatments can be wrought with confusing information because the requisite demands may seem contradictory.

Among the considerations for posterior restorations are establishing proper isolation for adhesive cementation, ensuring fracture resistance of the selected material for long-term function, and achieving proper anatomical form and marginal integrity. Superior fit contributes to the best possible outcome and functional longevity for the patient, while strength of the selected restorative material helps to ensure resistance against the masticatory force exerted on posterior dentition. Combined, ideal anatomical form, marginal adaptation, and appropriate proximal contact and contour are required of materials and resulting restorations used in posterior treatments.1 3

Additionally, aesthetics in posterior restorations have become an increasingly important consideration for both patient and clinician despite their location in less visible areas of the mouth. Shade and colour matching between the restorative material and natural tooth structure is necessary for creating lifelike restorations.6 8

The advent of new materials and the expanding use of CAD/CAM have ushered in improvements in ceramic materials. The result has been increased use of durable metal-free materials that are more aesthetic for successful treatments.7 Investment in terms of education, purchasing of the systems, and skills enhancement is required for proper and predictable use.

Among these advancements is lithium disilicate (IPS e.max CAD/Press, Ivoclar Vivadent), a universal all-ceramic material for indirect restorations. Because this material combines strength with high aesthetics, its durability, predictability, and longevity make it an ideal material for indirect posterior restorations.8

Lithium disilicate

Lithium disilicate (e.max) is categorised as a glass-based ceramic. It is generally composed of quartz, lithium dioxide, phosphorus oxide, alumina, potassium oxide, and other components.9 These powders are milled using the CAD/CAM technique. Lithium disilicate can be cemented using adhesive bonding (such as Multilink N/Automix, Ivoclar Vivadent) or conventional cementation techniques.9

The monolithic property of e.max contributes to the strength and aesthetics of the restoration. The traditional use of a high-strength core material made of zirconia or alumina decreased aesthetics owing to the high value and increased opacity compared with glass-ceramic materials. Even though these high-strength core materials demonstrated excellent mechanical properties, the added layers of veneered ceramic, which have a much lower strength, caused the overall strength of the restoration to decrease.9 Lithium disilicate circumvents these problems and offers both strength and high aesthetics for an expanded range of indications.
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Flexibility
Unlike other ceramics, e.max offers 560 MPa in strength, which is three times the strength of other ceramics.13, 14, 16 Another advantage is that e.max can be finished thinner without chipping owing to its higher edge strength.14, 16 Additionally, e.max provides exceptional aesthetics without requiring a veneering ceramic when processed in its monolithic form. This allows restorations to maintain their structural integrity.

The material is available in four translucencies, including high opacity, medium opacity, low translucency, and high opacity, medium opacity, high translucency. In a five-year study conducted by Ivoclar Vivadent, 97 per cent of the pressed e.max restorations studied received an excellent rating in aesthetics.17

Research continues to examine the efficacy of lithium disilicate restorations. Fasbinder et al., for example, investigated the longevity of lithium disilicate crowns, following 62 restorations over two years. The researchers found no identified cases of crown fracture or surface chipping. Over the two-year period, the patients were checked three times and none reported any sign of sensitivity.11

Guest et al. examined the fatigue behaviour and reliability of CAD/CAM-processed lithium disilicate compared with zirconia all-ceramic crowns veneered using the hand-laying technique. They concluded that the lithium disilicate crowns were superior in fatigue-resistant crowns compared with the zirconia crowns, which had a higher susceptibility to early veneer failure.15

Further, e.max can be used for a variety of indications, as demonstrated by Sorensen et al., in whose study e.max was used for the fabrication of three-unit bridges. The researchers concluded that by using e.max they achieved an acceptable clinical success rate.12 Other indications include posterior partial- and full-crowns, as well as implant-supported restorations.12

Case studies

IPS e.max can be used for a wide range of universal anterior and posterior indications. In our sample of 200 crowns regarding aesthetics are pleased after receiving their restorations, and clinicians can be assured of functional predictability. Posterior restorations fabricated from e.max demonstrate the requisite strength, aesthetics, and durability. Whether full or partial coverage, e.max restorations provide function and fit to ensure satisfaction of both clinician and patient. The following cases demonstrate the material’s versatility for a number of everyday restorative cases.

Case 1

The patient presented with three non-vital maxillary anterior teeth and had concerns regarding aesthetics and function. The anterior teeth were restored with IPS e.max in order to enhance aesthetics and function, and were cemented with Multilink N adhesive cement (Fig. 1b).

Case 2

A patient presented with failing ceramic veneers in the maxillary anterior region and concerns about the aesthetics of her smile (Fig. 2a). Owing to significant tooth decay, the teeth were prepared for full-crown restorations (Fig. 2b). E.max crowns were fabricated to establish an enhanced aesthetic appearance for the patient and cemented with Variolink N adhesive cement (Fig. 2c). The lithium disilicate material absorbs and reflects light in a similar manner to natural teeth. This variation of options for brightening the restorations enabled the dentist to meet the patient’s expectations.

Case 3

A female patient presented with worn dentition, a closed vertical dimension of occlusion, and poor esthetics, particularly on the left side (Fig. 3a). She expressed great concern about what she perceived as unacceptable aesthetics. The teeth were prepared for full-crown restorations owing to the extensive fillings and need to change the vertical dimension of occlusion radically (Fig. 1b). All of the maxillary teeth were restored with full-crown restorations fabricated with e.max. This material was selected based on its strength and durability, which would be necessary to establish a new and comfortable occlusion and desirable aesthetic outcome (Fig. 3b).

Case 4

The patient presented with mesial decay on a maxillary molar (Figs. 4a & b). A minimally invasive mesio-occlusal-inlay preparation was performed in anticipation of a lithium disilicate restoration. The preparation maintained the enamel on all of the peripheral margins. The mesio-occlusal inlay was placed and adhesively bonded to the enamel along all of the margins (Fig. 4c). Once placed, superior aesthetics and marginal fit were confirmed. The lithium disilicate restoration decreased the flexure of the tooth dramatically, which possibly decreased the risk of future fracture.

Case 5

A patient presented needing an implant abutment. A stock titanium abutment (BioHorizons) with Laser-Lok was used to wax and press an e.max implant abutment, which would be cemented to the titanium abutment (Figs. 5a & c). Since all-ceramic restorations can be subject to failure from the inside out, the stiffness of the core material and the coefficient of elasticity, was a consideration.

A titanium abutment with a high elastic modulus minimizes failure when lithium disilicate or zirconia is used. The pressed e.max was cemented to the titanium abutment in the mouth using Multilink Implant cement (Ivoclar Vivadent; Figs. 6d & f). This represents an entirely different method of implant restoration that is easier and less expensive (Figs. 6g & h).

Case 6

A patient presented with minimal enamel that was chipping off the maxillary anterior teeth (Fig. 5a). There was insufficient enamel to support a veneer restoration, so the teeth were prepared for full-cover- age restorations. Because e.max reflects light in a manner similar to natural enamel and has the same wear coefficient, it was the ideal material in this case. The maxillary restoration using e.max restorations demonstrated enhanced aesthetics and predictable function (Fig. 6b).

Case 7

The patient presented needing a complex reconstruction involving individual tooth and implant restorations, as well as periodontal treatment. The implants were placed, the teeth prepared, and a ceramic core crown fabricated (Fig. 7a). This represents an entirely different method of implant restoration that is easier and less expensive, involving a complex reconstruction of the posterior region, making it suitable for a range of indications. It has been studied repeatedly to confirm its strength and functionality, and my research confirms that lithium disilicate has been used with impressive long-term success (Fig. 11).

Case 8

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Case 9

A patient presented with periodontal disease and significant decay (Fig. 10a), resulting in the need to extract some of the teeth in the maxillary left quadrant and place implants. Additionally, there was a significant problem concerning the vertical dimension of occlusion and lack of anterior guidance. In addition, the patient was very unhappy with the appearance of his teeth. A metal–ceramic implant prosthesis was placed in the mandibular left quadrant and all of the individual lithium disilicate crowns were fabricated to create a more functional and aesthetic restoration. — Fig. 11: Chart documenting the author’s clinical success using lithium disilicate restorations.
Experience truly unbeatable value for money: Synea Fusion. Uncompromising user comfort with optimal LED illumination, 4x spray and quiet, vibration-free operation included.
Periodontal disease, as evidenced by the ground-breaking studies of Loe et al. and Page, refers to a group of infectious diseases of the periodontium, which are characterised by the destruction of the periodontal tissue, including the periodontal ligament, root cementum, alveolar bone and gingiva. Marginal periodontitis is an opportunistic infection (Fig. 2) that is caused by a Gram-negative anaerobic range of bacteria and results in chronic inflammation of the periodontal tissue.

The progressive loss of periodontal tissue and attachment is observed as a consequence of the persistent inflammation. Based on epidemiological studies (Fig. 2), the prevalence of chronic marginal periodontitis in the population over the age of 35 in Germany is approximately 40-45%. Approximately 55% of this age group suffers from a moderately severe and approximately 21% from a severe form of periodontitis. Moderately severe (approx. 15%) and severe (approx. 1%) forms of periodontitis have been observed even in 15-year-old adolescents. In the case of elderly people, almost every tooth may have loss of periodontal attachment.

Conservative therapy can prevent the progress of the disease. Therefore, the mechanical subgingival and supragingival removal of calculus and plaque is the primary objective of conservative periodontal therapy, which is aimed at destroying the subgingival biofilm and minimising the periodontal pathogenic bacteria. Bacterial biofilms and endotoxins can be removed from the root surfaces effectively by scaling and root planing, for which manual, sonic, or ultrasonic scaling instruments are employed. According to research, the use of mechanical scaling systems has become established because they make cleaning of the root surfaces easier, result in less fatigue and are more efficient for the dental treatment team. The AIR-N-GO PERIO instrument with its subgingival attachment and specially developed flow chamber (Fig. 3a & b) is an innovative method for biofilm removal—low-abrasion, sonically assisted air-polishing systems and ultrasonically assisted methods within the scope of conservative periodontal therapy.

Clinical study
Fifteen patients who had chronic marginal periodontitis at baseline were treated and re-examined over a period of three months. The clinical and microbiological parameters were recorded pretreatment, immediately after six weeks and after three months (Table 1).

After the preparative treatment had been carried out successfully and the patients had received a verbal and written explanation, those included in the study provided an informed consent and written declaration in accordance with the Declaration of Helsinki (following amendment by the 41st World Medical Assembly, Hong Kong, September 1989).

All patients were involved in preparative treatment after the initial examination. They received oral hygiene instruction and professional supragingival debridement as necessary. Depending on the patient, the first phase of the preparative treatment covered a period of at least three and at most five weeks (three to five days) and the instruments had to have a P1 score of approximately 1 within this period.

The preparative treatment included supragingival scaling and polishing of the tooth surfaces using the AIR-N-GO SUPRA (Fig. 4). This air polisher works with a mixed jet of air and water, added to which is a cleaning powder that has been specially developed to be minimally traumatic to delicate mucosal tissue. The powder's rounded microstructure and the fineness of the calcium carbonate-based microbeads protect the tooth enamel, and enable gentle and effective cleaning of the tooth surfaces. Moreover, the spray reaches areas that are difficult to access, such as tight interproximal spaces.

In addition to the decontamination processes already described, the intention in this case study is to illustrate the effectiveness of an innovative method for biofilm removal—low-abrasion air-polishing technology employed by systems such as the AIR-N-GO PERIO (Acteon Group) —as part of cutting-edge conservative periodontal therapy. Air-polishing instruments have been used successfully for a long time, particularly in professional tooth cleaning. The expansion of their applications to subgingival surfaces covered with biofilm has been associated with significant disadvantages, as there were no suitable instrument attachments available and only sodium bicarbonate powder could be used as the abrasive agent. This resulted in an inadequate ability to clean root surfaces and the risk of causing surgical emphysema. The AIR-N-GO PERIO systems replaces the insoluble sodium bicarbonate powder with soluble glycine powder, which is less abrasive. Moreover, in clinical studies (see documentation at www.airn-goperio.com), it was demonstrated that the glycine powder exerts no adverse effects on the surrounding soft tissue during the air-polishing process.

The AIR-N-GO PERIO instrument, with its subgingival attachment and innovative flow chamber (Figs. 3a & b) developed specifically for working directly in the periodontal pocket, is the result of cutting-edge technology in computational fluid dynamics. The adjacent anatomical structures are not endangered and thorough removal of the subgingival biofilm from the root surface reduces marginal inflammation. The initial results presented in this article are part of a clinically and microbiologically controlled and randomised long-term study of the comparative effectiveness of low-abrasion, sonically assisted air-polishing systems and ultrasonically assisted methods within the scope of conservative periodontal therapy.

Histological evaluation
Fig. 1: Reflection electron microscope diagram of the root surface with illustration of the boundary lines of the epithelial attachment, the connective-tissue attachment and the intra-alveolar epithelial attachment.16—Fig. 2: Incidence of moderately severe and severe periodontal disease in 35- to 44-year-old adults between 1997 and 2007 in percent.17—Fig. 3a: Reflection electron microscope diagram of the root surface with illustration of the boundary lines of the epithelial attachment, the connective-tissue attachment and the intra-alveolar epithelial attachment.16—Fig. 5a & b: Subgingival sampling was carried out using sterile paper points according to Slots.
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pooled for the patients examined. The test tube contained a buffer, which preserved the amino acids of the bacteria during the transport time.

Microbiological tests, such as the IAI PadoTest 4·5 of the Institute for Applied Immunology in Switzerland used in our study, employ small, synthetic DNA molecules complementary to the ribosomal RNA molecules as probes in order to analyse bacteria (such as Aa, Pg, Tf, Td, Aa, Porphyromonas gingivalis (Pg), T. forsythia (TF), P. gingivalis (PG)). Further, the total bacterial load (TBL) is a good indicator of periodontal infection. For patient typing, we used the classification system (cluster) also developed by the Institute for Applied Immunology as the IAI PadoTest 4·5 of the Institute for Applied Immunology in Switzerland used in our study, employing statistical methods based on the various bacterial distribution patterns. The advantage of this typing of periodontal pockets is that it records the complexity of the microbiological results using a single classification code, thus making it easier to identify their clinical significance.

Once the examinations had been completed, the mean values of the variables – PPD, CAL, BOP and GR – were determined and evaluated descriptively. The Wilcoxon signed-rank test was used to compare the original data with the findings after application of the low-abrasion, sonically assisted air-polishing system. The statistical tests were performed in SPSS.

Results

Demographic data

All the participants (n = 15; 56.6 % of the patients were female and 43.4 % were male) remained in the study for the entire observation period of three months; there was no change in the number of teeth investigated. The proportion of smokers included in the study was 37.5 %.

The proportion of smokers included in the study was 37.5 %. All the patients were examined in accordance with the study protocol.

Clinical parameters

The AIR-N-GO PERIO group (Table 2) showed an average gain in CAL of six weeks post-treatment of 0.30 ± 0.04 mm for the periodontium treated (mean reduction in PPD of 0.50 ± 0.02 mm) and for areas on the microbiological study teeth a gain of 0.87 ± 0.01 mm (mean reduction in PPD of 1.85 ± 0.06 mm). After three months, the AIR-N-GO PERIO group showed an average gain in CAL for the periodontium treated of 2.13 ± 0.04 mm (mean reduction in PPD of 0.50 ± 0.05 mm) and for areas on the microbiological study teeth a gain of 2.13 ± 0.14 mm (mean reduction in PPD of 1.54 ± 0.05 mm).

Table 3: Effect of the AIR-N-GO PERIO system on bacterial prevalence (in million pathogens/ml of sulcus fluid).

<table>
<thead>
<tr>
<th>Species</th>
<th>Baseline (x 10⁶)</th>
<th>Immediately post-treatment (x 10⁶)</th>
<th>After 6 weeks (x 10⁶)</th>
<th>After 3 months (x 10⁶)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aa</td>
<td>0.05</td>
<td>0.07</td>
<td>0.05</td>
<td>0.01</td>
</tr>
<tr>
<td>Pg</td>
<td>2.30</td>
<td>2.25</td>
<td>1.93</td>
<td>0.28</td>
</tr>
<tr>
<td>Tf</td>
<td>1.67</td>
<td>2.25</td>
<td>0.77</td>
<td>0.26</td>
</tr>
<tr>
<td>Td</td>
<td>1.92</td>
<td>2.09</td>
<td>1.08</td>
<td>0.18</td>
</tr>
<tr>
<td>TBL</td>
<td>87.21</td>
<td>42.81</td>
<td>55.21</td>
<td>20.69</td>
</tr>
</tbody>
</table>

The results for the four periodontal marker bacteria – Aa, Pg, Tf and Td – and the total number of marker bacteria (TBL) were recorded. The microbiological results are summarised in Table 4.

As exhibited the lowest concentration at baseline (0.05 x 10⁶) of all the species investigated. Six weeks post-treatment the concentration of the bacteria had reduced to 0; and three months post-treatment it had almost reached the baseline values again (0.05 ± 0.08 x 10⁶). The three other species (Pg, Tf and Td) reached concentrations at this time of 0.28 x 10⁶, 0.18 x 10⁶ and 0.18 x 10⁶, respectively. The microbiological situation three months post-treatment showed the colonisation of all four bacteria to be at a lower level than at baseline.

Pg and Tf were at an even lower level at this time than immediately post-treatment. Only Aa showed rudimentary recolonisation at three months after the elimination after six weeks, with an increase to 0.03 x 10⁶. Pg had reduced to 0.28 x 10⁶ at three months, which signifies a mean elimination of 84 % compared with baseline. Tf exhibited a reduction to 0.20 x 10⁶, which corresponds with a mean elimination of 59 % compared with baseline.

Microbiological profiles

Microbiological analysis of the pooled samples, based on data not detailed here, after initial examination showed that 57 % of the samples contained Aa; 85 %, Pg; 51 %, Tf; 91 %, Td; and 89 %, Td. The proportion of contaminated pockets decreased immediately post-treatment and increased again after six weeks, and in the third month, but without returning to the baseline values.

Pg exhibited the greatest prevalence of all the species of bacteria at each point. The bacterium was detected in 40 % of pockets at baseline, immediately post-treatment, in 55.5 % after six weeks and in 6.8 % in the third month after AIR-N-GO PERIO treatment.

60 % of pockets at baseline. Post-treatment, the species was only found in 50 % of pockets immediately post-treatment, in 60 % in the sixth week and in 50.67 % after three months.

Tf was detected in 51.73 % of all pockets pretreatment. Immediately after therapeutic intervention the prevalence of the species decreased (50 %), and in the sixth week post-treatment increased again to only slightly (56.6 %). With an incidence of 60 % after three months, Td almost reached 100 % and therefore almost complete recolonisation occurred in the periodontal pockets examined.

The similarly high percentage of pockets in which the species of the red complex (Pg, Tf and Td) were detected was striking. Pg, Tf and Td together colonised 77.27 % of all pockets prior to treatment. The prevalence of the complex became lower immediately post-treatment (55.5 %) and rose again in the third month post-treatment (47.2 %). At each point in the study, a combination of the four bacteria was found in most of the pockets (53.1 % of pockets at baseline, and 20.8 % and 28.8 % of pockets immediately post-treatment and after six weeks) irrespective of the form of therapy used. The proportion of pockets only containing one species of bacteria increased in the third month.

Conclusion

The effect on obligate pathogenic bacteria such as Aa, Pg and Td, which are the most difficult to control in therapy, is very promising. However, it must be noted that this is a reduction in the marker bacteria, not the required elimination of the obligate pathogenic bacteria. Therefore, indications that a better long-term outcome can be achieved after classic periodontal therapy using the low-abrasion, sonically assisted air-polishing system.

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An essential part of dentistry, endodontic treatment has remained a dreaded procedure in general practice unfortunately. The complexity and length of treatment, as well as the soaring possibility of failure, make practitioners increasingly search for ways to facilitate their work. The challenges to the development of new instruments lie in the combination of simplicity, timeliness and safety, without compromising the quality of treatment.

The recent development of endodontic systems featuring only one instrument for single use and particularly all-in-one files makes many of us question our real needs. A single instrument for root-canal shaping in continuous rotation, such as the One Shape (MICRO-MEGA), seems attractive, but is it truly effective? What are the benefits of a single-instrument system in comparison with the numerous multiple-instrument systems?

The key objectives of any root-canal preparation are cleaning and disinfection of the root-canal system with chemical-mechanical preparation on one hand, and respect of the initial canal path and sealed 3-D obturation on the other. Although these objectives of root-canal shaping, stated by Schilder in 1974, are commonly accepted, the means of achieving them are multiple and have evolved considerably during the last few decades. Endodontic hand instrumentation in the form of tapered stainless-steel files was introduced first at the beginning of the last century, from where they undergo numerous refinements. Their exclusive use still results in long and laborious sessions that do not completely fulfill all the criteria for root-canal shaping. However, the use of hand instrumentation remains necessary for initial exploration of root canals.

An extremely elastic shape-memory alloy in the form of nickel-titanium (NiTi) marked a revolution in endodontics in the late 1980s. Shortly thereafter, the concept of root-canal preparation using continuous rotation came into fashion and manual preparation gave way to faster operational sequences that respected the initial canal path better. NiTi allowed the design of instruments with a greater resistance, wider taper and elastic properties favouring a mechanical application of the coronal-apical preparation concept. This aimed to eliminate coronal constraints progressively in order to make the apical zone more easily accessible. Thus, it did not only save time, but also allowed for better centring of the instruments, while reducing the expulsion of dentine debris beyond the apex. Moreover, it facilitated instrumentation in complex cases.

Despite the numerous benefits widely described in specialist literature, significant disadvantages of preparation with continuous rotation occur. The risk of instrument separation is vexing, as it can cause the entire root-canal treatment to fail. The risks multiply with the use of sequences consisting of several instruments, which also create ergonomic and inventory management constraints.

Moreover, many studies have demonstrated the possibility of contamination between two patients after reuse of endodontic instruments owing to the persistence of debris after sterilisation. Single-use single-file systems therefore provide the possibility of alleviating these difficulties in root-canal shaping.

The One Shape concept

This instrument, with a constant 0.06 taper and a tip diameter of 25/100 mm, comes in a scored blister pack and is ready for use. It is used in continuous rotation and does not require an additional motor, as long as the existing device attains the recommended speed of 400 rpm.

One Shape is currently available in three different lengths (25, 25 and 29 mm) and can be used for most indications in endodontic treatment. Apart from some special features, its design resembles that of most files used in continuous rotation available on the market. Its profile has three different cross-section zones along the active 16 mm blade (cf. photograph PPT), including a section with three cut-
system be ensured, particularly in the inaccessible zones. Thorough irrigation should be repeated after each instrument passage. A total contact time of 15 minutes per canal is recommended for each endodontic treatment. The root-canal preparation is then resumed, starting at the point of resistance. It must be noted that the instrument’s cutting efficiency generates a considerable amount of debris, which can accumulate in the instrument’s flutes. Thorough cleaning of the file after each treatment step is essential to avoid apical plugging. Once the working length has been reached, the instrument can be used in a circumferential filling movement to remove coronal obstructions.

Conclusion
One Shape proves that one instrument can be used for the preparation of the root canals of one tooth. However, a new file should be used if there is any change in the file. Files should be disposed of after the root-canal preparation in accordance with the waste management regulations for soiled waste, thus reducing the workload of medical staff and minimising infection risks.

One Shape is based on proven principles like that of continuous rotation, allowing us to keep our long-acquired habits in the use of this technique. The refined ergonomics with regard to the instrument sequence and inventory management in the dental office is a major benefit of single-use single-file systems. The time-saving could then benefit the root-canal irrigation, which is time-consuming and under-used, despite its efficiency.

Editorial note: A complete list of references is available from the publisher.
“Dentistry has always been my first priority”

An interview with Muhammad Hafiz Zainal

Muhammad Hafiz Zainal

Twenty-one-year-old Muhammad Hafiz Zainal is an aspiring dental student from Malaysia. He also sings and performs on the video-sharing platform YouTube, where he recently came second in a worldwide singing contest held by Islamic record company Awakening Records. Dental Tribune Asia Pacific had the opportunity to speak with Hafiz, who is studying dentistry at Alexandria University in Egypt, about how he came to launch an online music career and the reasons he is still pursuing a professional existence in dentistry in addition to his singing.

Why did you decide to study dentistry in Egypt? There are a number of good dental schools in Malaysia. Although there are a number of very good dental schools, fees are very high when you do not have a scholarship. Therefore, the main reason I decided to go to Egypt to pursue my studies in dentistry was because the fees there are much more affordable. Some universities in Egypt are also recognised by Malaysia, which will allow me to work in my home country after I have graduated.

Since Egypt is also an Islamic country, it is easy for me to get along with the locals. And there is never any problem finding halal food.

Would you consider giving up your studies if someone offered you a record deal with Awakening Records? Never! I have my family, friends and fans who really believe in my talent and support me no matter what. In fact, several recording companies at the moment are interested in auditioning me. I will still continue posting videos on my YouTube channel.

What will you plans for the music industry? Since Egypt is also an Islamic country, it is easy for me to get along with the locals. And there is never any problem finding halal food.

What kind of music do you perform? I perform a range of different music genres. Generally like R&B, ballads, pop and soul music. They really suit my voice and singing style. I love songs that are intended to inspire in particular, as they really inspire me each time I listen to the lyrics. I have many music idols, but recently I have been listening to Mariah Carey, Chris Brown and Maher Zain, a Lebanese-Swedish singer and songwriter, a lot.

A few very successful singers began their careers on YouTube, such as Justin Bieber. Do you consider the platform a spring-board to fame, and would you recommend the same to your fellow students? Absolutely. There are so many young talents out there who are eager to share their precious gifts with the world. I encourage them to post videos on YouTube and see how people around the world react. Eventually, they will start to gain some followers and fans. Maybe a recording company will realise their talent and sign them up right away. We will never know if we don’t try. For me, it is now or never.

Malaysian Idol, a spin-off of the successful UK talent show was cancelled in 2007 after only two seasons. Has YouTube generally become the better platform for discovering talents? Both formats have their advantages and disadvantages. Reality TV shows like Malaysian Idol are a great platform to become famous in Malaysia and neighbouring countries, but the whole world will become aware of you if you have millions of viewers and subscribers on YouTube.

Would you consider giving up your studies if someone offered you a record deal? Never! I have my family, friends and fans who really believe in my talent and support me no matter what. In fact, several recording companies at the moment are interested in auditioning me. I will still continue posting videos on my YouTube channel.

Thank you very much for the interview.
Digital dentistry event held for the second time in Singapore

Global movers and shakers to gather at CAD/CAM and Digital Dentistry International Conference

DT Asia Pacific

SINGAPORE: With digital imaging and dental CAD/CAM, advanced information technology has gained increased significance in dental practice in recent years. While it has become widely established in Western markets by now, most dentists and dental laboratories in Asia are only now starting to incorporate the new technology into their workflow. Owing to under-penetration in dental offices and increasing interest by dentists in investing in the technology, markets in the region are therefore expected to see dramatic growth by 2016, according to a recent paper by Cana-sian market intelligence provider Millennium Research Group.

In order to facilitate this development and to give professionals in the region access to the latest expertise and developments in the field, the Centre for Advanced Professional Practices (CAPP) Asia is hosting its second CAD/CAM and Digital Dentistry International Conference on 4 and 5 October at the Marina Bay Sands hotel in Sin-gapore. A spin-off of the successful congress series held by CAPP in Dubai in the United Arab Emirates annually since 2006, the event is organised in collaboration with the Singapore Dental Association (SDA). The first show, held in Octo-ber 2012, saw over 500 dentists and dental technicians from the region attending the two-day congress. Similar figures are anticipated for this year’s event, with a larger share of professionals from countries outside the city-state expected.

Last year, the conference saw participation by professionals from Malaysia, the Philippines and Thailand, among other countries.

According to the organiser, a Dental Tribune International-affili-ate, the scientific programme includes presentations by interna-tional digital dentistry experts on topics ranging from digital impres-sion taking to digital orthodontics and computer-guided implant planning. Presenters include Drs Lutz Ritter, Andreas Bindi and Eduardo Malavisi, among other pro-minent dental clinicians.

A parallel session will be held on the second day of the conference will be targeted at dental technicians and discuss the latest solutions, materials and working processes for the digital workflow in dental laboratories.

In addition, leading providers in the field will have their latest so-lutions and equipment on display. The industry exhibition, staged alongside the scientific sessions, has been sponsored by a number of companies, including Sirona Dental Systems, Ivoclar Vivadent, 5Shape and Degudent. Specialist companies, such as rapid prototyp-ing specialists Roland DG, have also announced their participation in the showcase event, which will host over 50 companies from around the world.

In between sessions, atten-dants will have the opportunity to interact with the sponsors directly and try out the latest digital gadgets and tools, CAPP Asia said.

Dental professionals interest-ed in attending the event can still register in advance on the event website at www.capp-asia.com or on-site once the event has begun. Discounts are available to mem-bers of the SDA, as well as dental auxiliaries and students, according to the organiser.

"Dentistry is way behind in embracing new technologies"

An interview with SDA president Dr Kuan Chee Keong

The CAD/CAM and Digital Den-tistry International Conference organised by CAPP Asia will again be held in collaboration with the Singapore Dental Association this year. Dental Tribune Asia Pacific spoke with the president of the organisation and Q & M Dental Group shareholder Dr Kuan Chee Keong about the association’s decision to support the event and what it will do to advance dentistry in the city-state.

Dental Tribune Asia Pacific: This year CAPP Asia’s CAD/CAM and Digital Dentistry Interna-tional Conference will be held in Singapore for the second time. What was the response to the first event in 2012 from the dental community here?

Dr Kuan Chee Keong: The inaugural symposium was well at-tended, which was a pleasant sur prise for all of us. When CAPP Asia first approached us with its proposal to organise a CAD/CAM symposium in Singapore jointly, there was un certainty among members of the council whether to proceed. A few of us however made a strong pitch for it and fortunately we made a commit ment to collaborate. Feedback from dentists so far has been mostly positive and encouraging. However, we shall also be looking at areas that need improvement.

What made you decide to sup-port this event in the first place, and what in your opinion are its prospects?

When we were debating whether to collaborate with CAPP Asia, one argument was that CAD/CAM is a new and relatively unproven technology compared with conven-tional prosthetics and therefore the Singapore Dental Association should not be involved in a CAD/ CAM event. Computerisation and advanced technologies however have become the future of dentistry. When I was in dental school, I never used a laptop but now it is an essen-tial tool. A paperless dental office, digital imaging, online transactions and many other advances are just some examples of commonplace computerisation.

Shouldn’t we face up to CAD/ CAM? In fact, dentistry is way behind in embracing new technologies. High-tech industries are using 3D printing and we are still struggling with digital impressions. Dentistry needs to be evolving constantly too.

Singapore dentists are usually among the first adopters of new technologies in Asia. How common is the use of dental CAD/CAM, and for what clinical purposes is it used the most to your knowledge?

Perhaps this question is better answered by suppliers like Fondaco Dental and others. There are no offi-cial statistics about the use of CAD/ CAM to my knowledge. At Q & M Dental Group, we make use of it with CEREC 3D for fabricating crowns and bridges primarily.

In your opinion, what are the benefits of using dental CAD/CAM in clinical practice?

Less time is needed for the pro duction of fixed prostheses. In ad dition, we do not need to fabricate customised trays or use impression materials, so waste can be reduced. This is a step in the right direction to be more environmentally friendly.

Singapore is poised to become an important hub for dental tourism. Will the use of dental CAD/ CAM help to support this develop ment in the long run?

 Providing excellent dental care in shorter treatment time holds sig nificant appeal to dental tourists. With travelling costs going down constantly, more people from elsewhere will be able to fly to Singapore in the morning, have some porcelain prostheses fabricated using CAD/CAM and fitted almost imme diately, then do some shopping and later flight back home. Singapore is not alone however. Other countries in the region are catching up and it is a mistake to assume that Singapore will always be the leader in health care. We have to make an effort to stay abreast of the latest technologies. The CAPP Asia conference is a good example of that.

Thank you very much for the interview.
Opinion

Taking guided implantology to the next level

Dr Lutz Ritter

Exciting times are indeed ahead for digital dentistry, as was evident from the firework of innovations present — all fields of dentistry at the latest International Dental Show in Germany. As professionals, we have to keep up to date, but also be cautious of new technologies.

Despite all the improvements in different technologies, it has not necessarily become easier to stay abreast of developments. The ongoing expansion of possibilities and updates in the field of CAD/CAM dentistry has increased the need for qualified education and professional exchange at peer level.

Particularly in guided implantology, new opportunities for treatment planning and therapy are becoming available through the combination of existing 3-D technologies. The use of new 3-D diagnostics with the help of CBCT has not only improved pre-treatment diagnostics in general, but has also opened up new possibilities in the planning process through the use of intelligent software.

At the same time, questions arise constantly and the responsibilities of the user to offer complete diagnostics have increased as well. Linking X-ray-aided planning with CAD/CAM systems already in the planning phase is an innovation that is intended to make the transition to implant-supported prostheses much easier.

By now, dentists are able to perform many of the steps themselves, including digital planning, manufacturing drilling templates chairside and fabricating CAD/CAM prostheses.

In considering its many advantages, it should not to be forgotten that technology has to remain comprehensible, transparent and usable for the dentist. The aim of my presentation at this year’s CAPP Asia conference in Singapore is to place the emphasis on the practice-relevant aspects of the latest technologies and to provide perspectives on the advantages they have to offer.

Along with the latest tips and tricks, I want to communicate the possibilities and limits of current technology, such as manufacturing drilling templates chairside and many others.

I hope that you draw something of interest from the presentation. Personally, I want to invite newcomers to become acquainted better with the often-difficult first steps with the help of experienced users. Even from a surgical perspective, I can say it is worth the effort.

Dr Lutz Ritter is currently a maxillofacial and plastic surgeon at the University Hospital of Cologne’s Centre for Dental, Oral and Maxillofacial Surgery. On Saturday, 5 October 2013, he will be presenting a paper titled “Taking guided implantology to the next level: Integrating CAD/CAM and CBCT” as part of the second Asia Pacific CAD/CAM and Digital Dentistry International Conference scientific programme in Singapore.
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CAD/CAM and growth factors

Key areas of dental innovation

Dr Nilesh R. Parmar
UK

Dentistry has come a long way since our forefathers were forced to use foot powered drills and mix amalgam from its bare components. Modern day dental equipment and materials are at the cutting edge of medical and dental innovation, and it's trade shows such as the International Dental Show (IDS) where the developments of the future are announced. Modern dentists no longer have merely a straight probe and a dental drill at their disposal. We now have scans, 3-D images, growth factors and an almost unlimited choice of materials available to use.

In writing this piece, I made a tough decision to focus on what I believe to be key areas of dental innovation. It is in these areas of imaging, CAD/CAM technology and growth factors that I believe are going to be important in the dental surgery of the future.

CAD/CAM

Computer-aided design/computer-aided manufacturing has had a presence in dentistry for nearly 20 years. However, it is only in the last ten years that developments have really made a difference in the reliability, ease of use and functionality of these devices. We now have CAD/CAM machines (e.g., CEREC, iTero, Lava) that can scan an entire arch, design and fabricate all-ceramic restorations in the practice. The popularity of chairside CAD/CAM units has never been greater. The materials that we are able to use in conjunction with CAD/CAM scanners have gone from monolithic, one shade blocks to multi-layered, all-ceramic, lithium-disilicate constructions that can be sintered and finalised in as little as 15 minutes.

The appearance of these restorations, although still needing a well-trained (and artistic) dentist, could be said to be on par with certain lab-based fabrications whilst maintaining the advantages of being a chairside single visit restoration. CAD/CAM technology is now almost universally used in the fabrication of dental implant abutments and bars, reducing construction times, designs and fit. Dentists are now beginning to use chairside CAD/CAM devices to restore dental implants without the need for any impressions.

CBCT 3-D scanners and CAD/CAM integration

Cone beam computed tomography (CBCT) scans are now commonplace in dentistry, particularly in implant dentistry where Grundahl (2007) found that 40 per cent of all CBCT scans were taken for implant treatment. Where 3-D scans were reaching a shortfall was in actually relaying the information obtained into the mouth during the surgical procedure. One recent innovation has been to overlay scans of the patient’s own teeth and soft tissues onto the CBCT scan data. This gives an accurate representation of the hard and soft tissues and their relationship to each other. For example, an implant can be planned in the implant software with the angulation of the implant taking into account the ideal position of the final crown, which can also be shown in the CBCT scan.

In order to do this previously, the dentist would have to make a study model and then wax up the ideal final restoration contour, ensuring some barium sulfate within the wax in order to show up in the scan. This was both costly and time consuming. Recent developments have allowed one to take an immediate scan, use the new technologies that have merely a straight probe and a dental drill at their disposal. We now have scans, 3-D images, growth factors and an almost unlimited choice of materials available to use.

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Computer-aided crown design—Fabrication of CAD/CAM crowns chairside

Dr Andreas Bindl
Switzerland

CAD/CAM technology allows dental professionals to manufacture solid all-ceramic crowns chairside. A digital image of the preparation is captured with an intra-oral camera and the crown is designed accordingly.

IPS e.max CAD (Ivoclar Vivadent), which has been on the market for some time, is a lithium disilicate glass-ceramic that demonstrates a flexural strength of 560 MPa. This ceramic is milled to the desired shape while it is still in its metastable or blue state (approximately 150 MPa). Subsequently, the ceramic is crystallized for 20 minutes. During this process, the material attains its final state and obtains its excellent mechanical and aesthetic properties. IPS e.max CAD is available in a low translucency (LT) version, which is suitable for the fabrication of crowns and implant-retained crowns. The high translucency form is intended for the construction of inlays and partial crowns. The stains...

A variety of ceramics are available for the construction of crowns, for example an aesthetic, easy-to-mill ceramic such as IPS Empress CAD (Ivoclar Vivadent). This makes them strong enough to withstand masticatory forces in the long term.

Syntac/Variolink II or Multilink Automix, all Ivoclar Vivadent). This ceramic is milled to the desired shape while it is still in its metastable or blue state (approximately 150 MPa). Subsequently, the ceramic is crystallized for 20 minutes. During this process, the material attains its final state and obtains its excellent mechanical and aesthetic properties. IPS e.max CAD is available in a low translucency (LT) version, which is suitable for the fabrication of crowns and implant-retained crowns. The high translucency form is intended for the construction of inlays and partial crowns. The stains...

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and glaze are applied before the crystallisation process.

As a result, subsequent polishing is unnecessary. Owing to the high strength of the restoration, adhesive cementation with a separate dentine conditioner is not indicated as long as the thickness of the ceramic is not less than 1.5 mm. Self-adhesive cementation materials can be used. The new self-adhesive composite SpeedCEM (Ivoclar Vivadent) is particularly suitable for this purpose.

In this case report, the chairside creation of a crown is described on the basis of a clinical case using IPS e.max CAD LT and the new SpeedCEM luting cement.

Clinical case report

Tooth R25 of a 52-year-old female patient was restored with a crown owing to extensive destruction of the dental hard tissue (Fig. 1). First, the tooth was prepared with a shoulder of approximately 1 mm in width (epigingivally). Subsequently, the preparation was dusted with IPS Contrast Spray (Ivoclar Vivadent) and a digital impression was taken with the CEREC Bluecam camera (Sirona).

The Version 3.8 of the CEREC software generates a visual image of the antagonists, which replaces the centric bite record. In order to match the maxillary and mandibular teeth, an image of the centric situation was captured from the buccal aspect (Fig. 2). The maxillary and mandibular teeth were matched semi-automatically (Fig. 3). The 3.8 version is capable of designing biogeneric occlusal surfaces for full crowns. The software provides a design proposal for the tooth morphology, which is based on the occlusal surface of the distal neighbouring tooth and the antagonist (Fig. 4). The image of the bucco-oral cross-section of the crown allows the user to check the minimum occlusal thickness of 1.5 mm (Fig. 5). The minimal densification of the ceramic (0.2 vol.%) during the crystallisation process is taken into account by the software and adjusted accordingly.
After the crown had been milled, the proximal and occlusal contacts were adjusted on the patient (Figs. 6 & 7). In this case, the white and creme materials from the corresponding stain assortment (IPS e.max CAD Crystall./Stains, Ivoclar Vivadent) were sparingly applied to the cusp tips and the sunset material to the tooth neck and in the fissures.

Immediately afterwards, a glaze in spray form (IPS e.max CAD Crystall./Glaze Spray) was applied to the outer surfaces of the crown. The spray was applied several times. Once the restoration had been fully coated with a white-opaque glaze layer, the crown was fired in a combined crystallisation and firing process in the Programat CS furnace (Figs. 8 & 9).

Before the restoration was cemented in place, the inner surface of the crown was etched with 4.9 per cent hydrofluoric acid (IPS Ceramic Etching Gel, Ivoclar Vivadent) for 20 seconds. Subsequently it was silanised for 60 seconds (Monobond Plus, Ivoclar Vivadent). The crown lumen was filled with the self-adhesive SpeedCEM. Next, the crown was securely seated on the prepared tooth by applying even pressure (Fig. 10).

The cement residue was polymerised for one second per surface (mesio-oral, disto-oral, mesio-buccal, disto-buccal) with a curing light (blue-phase in the low power mode, Ivoclar Vivadent) at a distance of about 5 mm. In this cured state, the cement was removed with great care using a scaler and a probe. The cement was fully cured with the bluephase in the high power mode. Subsequently, the cement margin was polished.

The final inspection revealed the restoration to be in harmony with the overall situation (Figs. 11 & 12).

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