40th APDC held in Manila

DT Pakistan Report

MANILA - The 40th Asia Pacific Dental Congress (APDC) was held at the SMX Convention Center in Manila, Philippines, from 7-11 May. It was held concurrently with the 109th Philippine Dental Association Annual Convention & Scientific Meeting, gathering the region’s dental practitioners, researchers and allied health professionals.

Pakistan delegation led by Dr Mahmood Shah President (PDA) included Dr Asif Arain and Dr Anwar Saeed. Dr Asif Arain was elected for the 6th time as Vice President APDF a real honour for him and Pakistan. Dr Mahmood Shah also won his chairmanship of oral diseases commission while Dr Anwar Saeed could not retain his slot.

Pakistan Dental Association was given a rare honour of presenting the awards with the host country. The PDA delegation also presented lifetime achievement awards to the distinguished members of APDF who have served the association over the years for the services rendered.

The congress has dental science and technology at the forefront in line with the rapid advances in dental materials and technology are benefiting patients, as well as practices, with the knowledge and technology required to offer advanced treatment options such as laser, aesthetic, digital and implant dentistry.

The theme “Intensifying professionalism in synergy with dental science and technology” compliments the fact that participants will be able to discuss the scientific and technical breakthroughs that are changing the landscape of dentistry, and fulfill their continuing education and professional development requirements.

“Our theme for this year aptly describes, how we as dental professionals are intensifying our efforts in synergy with dental science and technology to provide our patients with the best possible care. The APDC provided an ideal platform for us to share our knowledge and experiences with colleagues from around the world.”

Continued on Page 15

PDA President Elected in Manila

DT Pakistan Report

MANILA - Dr Mahmood Shah, PDA President, was elected as Chairman of Oral Diseases Commission, Asia Pacific Dental Federation (APDF) at APDF Elections held during 40th APDC in Manila, Philippines.

13 Countries voted in favour of Dr Mahmood Shah, whereas his rival Dr Chow Kaifoo (from Malaysia) could only get 7 votes.

This is Dr Mahmood Shah’s third consecutive victory as elected Chairman of Oral Diseases Commission, APDF. Previously, he had defeated candidates from Sri Lanka and Philippines.

Dr Asif Niaz Arain was also re-elected as Vice President, APDF.

PDA (CC) invited to Sindh Assembly

DT Pakistan Report

KARACHI - A delegation of Pakistan Dental Association (CC) office bearers and council members was invited to the Sindh Assembly by the honourable speaker Agha Siraj Durrani. The delegation led by Dr Mahmood Shah President PDA (CC) and accompanied by all the office bearers and council members.

Dr Mahmood Shah was presented with Sindh Assembly Shield and the entire delegation was accorded a VIP Protocol. The delegation was given cultural gifts including Ajrak and Topi. The delegation on the invitation of the speaker witnessed the assembly session as well.

During this high profile visit, matters related to promotion of Oral Health were discussed. It was also discussed that a Sindh Dental Act should be enacted for which PDA has started working.

This is the first time that PDA members were invited to the Sindh Assembly as a delegation.
SINDH BUDGET 2018-19

**Over Rs. 96 Billion Earmarked for Health Sector**

**DT Pakistan Report**

**K A R A C H I - S i n d h** Government has allocated Rs. 96.38 billion for the Health Sector in the budget for financial year 2018-19. "Apart from rupees 12.2 billion for non-development side, rupees 12.50 billion have been allocated in the head of development," Sindh Chief Minister Syed Murad Ali Shah, said at the Sindh Assembly, while presenting the budget. He further said that, new schemes within the health sector would be accommodated under the provision of Rs 50 billion.

Shah also elaborated his government’s performance in 2017-18, highlighting 68 new uplift schemes of Rs 5.12 billion, including RHGs, Trauma-Emergency Centers and construction of warehouses at all divisional HQRs for cold storage facility; four schemes of up-gradation of RHC, to THQ Hospitals and establishment of Cancer Ward at NIMRA, Jamshoro at the cost of Rs 1.086 billion.

EPF operational budget under Sindh Immunization Support Program increased from Rs 100 million to Rs 1.80 billion while expansion of 2160 LHWs at a cost of Rs 962.31 million in addition to 1063 LHWs under Thar Package.

He acknowledged the services rendered by National Institute of Cardiovascular Diseases (NICVD) which is the biggest center for the treatment of heart attack and primary angioplasty in the world. Currently, 6 chest pain units are functional in Karachi and 60 more such chest pain units will be installed in different areas of the province. NICVD satellite centers are present in Tando Muhammad Khan, Larkana, Hyderabad and Sehwan, in collaboration with the Government of Sindh. Soon, 3 more NICVD centers will be made functional at Nawabshah, Khairpur and Mithi in the year 2018.

Grant for NICVD has been enhanced from Rs 5.769 billion to Rs 6.094 billion for next financial year. **Initiatives under PPP:** Murad Shah said that 1,213 health facilities have been outsource on performance based management contract, which include 1,049 facilities to PPHI and 158 facilities outsource to some other NGOs (108 Integrated Health Services, 35 HANDS, 01 Indus Hospital, 13 Medical Emergency Relief Foundation, 01 Poverty Eradication Initiative.) **Continued on Page 15**

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**PDA Gives International Awards in Manila APDC**

**DT Pakistan Report**

**P a k i s t a n** Dental Association was given a unique honour at the 40th APDC in Manila where Asia-Pacific Dental Federation and Philippines Dental Association accepted PDA President Dr Mahmood Shah’s request of giving PDA Life Time Achievement Awards to International Dental Stalwarts, at the Gala Night of 40th APDC. Dr Mahmood Shah, PDA President, gave 05 Life Time Achievement Awards to FDI, APDF, ICCDE Presidents, APDF Secretary General and APDC Chairman. A special Humanity Award was presented to Prof Dr S.M. Balaji in recognition of his outstanding contributions in Cranio-Facial Surgery. Prof Dr Balaji provided free treatment, airfare, boarding and lodging for poor patients from Pakistan seeking treatment in Chennai, India.

**PDA Plaque to FDI President, Dr Kathryn Kell (USA)**

**PDA Plaque to ICCDE President, Dr Jeffrey Tsang (Hong Kong)**

**PDA Plaque to APDF Secretary General, Dr Oliver Hennedige**

**PDA Plaque to APDC Chairman, Dr Villalob (Philippines)**

**PDA Plaque to APDF President, Dr Fernando Fernandez (Philippines)**

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**PDA Plaque to Prof Dr S.M. Balaji (India)**
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ICD: Honouring the world's leading dentists since 1920

By Nathalie Schiller

The International College of Dentists (ICD) will celebrate its centennial in 2020. The ICD is the oldest and largest honour society for dentists in the world and was conceived by Drs Louis Ottoff and Tsunrjik Oikumuna with the vision to establish recognition of outstanding contributions to the dental profession in upholding the core values of leadership, recognition, humanitarianism, education and professionalism. After an invitation from the Chair of the Dental Tribune Online, I had the pleasure of speaking with Dr Dow Sydney, the International Editor and Director of Communications, as well as the Chair of the College Centennial Committee.

Dr Sydney, tell me how and why you became involved in the ICD.

It was in a manner very typical of the ICD. I had a patient who was a dentist and told me about the voluntary work he was doing for an ICD clinic for blind people. I had no idea then what the ICD was about. He told me more about the ICD and asked whether I would like to become involved in the clinic to help the patients see. I agreed on the background and CV, said he would like to nominate me to become a fellow. That was in 1996 and I was proud to agree. I was active in the Israel District and then moved to the European Section board as agent, editor and website manager. Later, I was asked to serve on the worldwide executive of the organisation as the International Editor and Director of Communications for the ICD.

While our organisation is focused on improving access and quality of oral health, we are also a professional society of shared interests and values. For us, there is also the meaningful fellowship and camaraderie aspect: we meet at regional and international levels for both serious discussions and social events. This is a unique group in which there is a strong feeling of belonging and a sense of community.

Is dental care the main thing we should worry about in parts of the world that are so different?

Oral health is usually treatable, often preventable, and yet if one has a bad toothache, one cannot function; if one loses one's teeth, one cannot eat. In many parts of the world where nutrition is poor, without functional teeth to eat properly and digest food, overall health is affected. Furthermore, there are places in the world where dental infections are so neglected and serious that they lead to major disease states and even death.

Another strength of the ICD is that we look at the overall impact of our projects on the community. I recall reporting on a group that went to Nepal to help children in great need of dental care. When the team arrived, they encountered unexpected problems. The community was suffering from mass diarrhoea, a major disease in the Third World. People can become extremely ill and die from not having access to clean running water. The water used to brush the children's teeth was contaminated. The team developed a programme to bring running water into the village for toilets and sinks for toothbrushing. The rate of diarrhoea went from 75 per cent to 5 per cent. Children were able to go back to school. The adults could work. This is a good example of how ICD dental projects can have a major impact on a community and the overall health of the region. The site's success is due to the fact that the ICD core values are sustainable and worthy. The projects, the organisation and the dedication of our members to improving oral health care will be sustainable because our philosophy is deeply belief in what they are doing; had they not, the ICD would have disappeared long ago.

I remember a dentist who once told me he needed to do what he wanted and stay true to himself. Therefore, he did not want sponsors because he wanted to stay objective and not want to feel he had to promote a company or a product and in doing so lose a critical component of his work. What is your take on this?

How are ICD projects initiated?

There are many kinds of projects. Some are directly funded through the ICD's Global Visionary Fund. Also, we look at the 5 sector benefit to ensure they have their own foundations or funds to initiate their own projects. Many fellows are also involved in individual ICD projects. Soon, we will be introducing an interactive map of hundreds of projects on our website where a visitor can see educational projects, student exchange programmes, humanitarian missions and more. We currently have a major programme on antibiotic resistance owing to the fact that antibiotics today are becoming less and less effective. We work with the Centers for Disease Control and Prevention in Atlanta in the US and the World Health Organization to put on a programme teaching dentists at all levels to deal with antibiotic resistance. We also provide programmes on sepsis and sterilisation.

2020 will mark the 100-year anniversary of the ICD. What are the changes, progress and developments you are the happiest about today?

The fact that we grew from a concept first established by a Japanese dentist and an American dentist meeting a 100 years ago endeavouring to have an international organisation to today, with the largest footprint of any dental honour society in the world, says a great deal. The integrity of the organisation throughout our 100 years in recognising those dentists who truly demonstrate having made major contributions to dentistry and society has been consistent. We are not a very large organisation, and we are the only ones who are aware of the ICD. We realise that, in order to honour our motto of “recognizing service as well as the opportunity to serve” and to be true to the vision of our founding fathers, we do have to make ourselves better known in order to ensure that deserving dentists are recognised by the college.

The centennial is a watershed moment for the college and validates...
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The effect of partial vacuum on the chemical preparation of the root canal system

By Dr. Philippe Sleiman

From the early 20th century, when Walter Hess and Ernest Zirori demonstrated root canal anatomy with an unprecedented visual clarity, its complexity has fascinated researchers armed with ever better imaging tools—from blue dye to CT, from CBCT to confocal microscopy, from clear tooth preparations to micro-CT, to name just a few. Thanks to rigorous research and discussion, the diverse intricacy of root canal morphology is well understood and accepted today. However, the question of how to best prepare this space to restore homeostasis remains open to debate, which is conducted both in the scientific and, unfortunately, commercial domains. Our task as scholars and clinicians is to investigate which approaches would be practical and applicable to bring teeth and periodontium back to health in accordance with evidence-based endodontics and principles of minimally-invasive dentistry.

As yet another array of new file systems are launched in the market, we seem to share an understanding that files do not have the ability to clean root canal space, only preparing, i.e. shaping it, while it is the irrigation process that provides a level of cleanliness that can, hopefully, create conditions for the body to heal. Thus, given that the shaping is acceptable (i.e. the files used remove the bulk of the pulp and/or infected dentine without blocking the system with debris as well as maintain the original shape of the canal without any micro-crack formation), it is the chemical preparation that is responsible for treating the system in all its complexity.

For a long time, irrigation remained a somewhat mystical part of the process, with a general agreement that a good rinse is necessary, but without a standardised sequence of irrigation. While various tools for irrigation and activation of solutions were studied extensively, the first sequence was suggested only in 2005, and it made clinicians aware that alternating solutions could be as beneficial as the use of negative pressure in order to achieve a clean root canal space and diminish postoperative pain.

Below you will find descriptions and outcomes of several studies that led to a suggested protocol of irrigation that is presented in the conclusion of the present publication.

Investigating irrigation today

The fact that during root canal shaping the system may get blocked by debris led to the question of how to best conduct the chemical preparation so that the dentinal tubules remain open to allow for a better cleaning and, consequently, sealing of the system. Drawing from clinical experience and improved outcomes, Jaramillo et al. have formulated an experimental irrigation sequence based on Sleiman’s 2005 suggestions, and added a negative pressure device to see if it may have added benefits. Scanning electron microscopy used to evaluate the cleanliness of dentinal tubules at three different levels of the canals demonstrated that our experimental sequence—alternating the use of 6 percent NaOCl and 17 percent EDTA with water in between—had shown a significantly better ability to keep the entrances of dentinal tubules open and avoid the blockage of dentinal tubules by the smear layer and debris during the cleaning and shaping procedure compared with the use of 6 percent NaOCl or 17 percent EDTA alone. The results emphasized the importance of the early use of 17 percent EDTA and not only as a final rinse.

This sequence allows us to use the standard endodontic irrigants during chemical root canal preparation and prevents any chemical interaction between them thanks to the use of distilled water at strategic times. Depending on the pH levels and the nature of the solutions, such chemical interactions may have a variety of consequences, from brown (and in some instances, cariogenic) precipitation to dentine modification, potentially affecting general health and/or quality of the dentine inside the root canal system, which, in turn, may influence the longevity of the link between the sealer and the dentine, thus changing the outcome of the root canal treatment in general.

Another finding of the study that echoed positive clinical outcomes related to the use of negative pressure in combination with the experimental irrigation sequence; the irrigation protocol that included both the Sleiman sequence (alternating between sodium hypochlorite, water, and EDTA) and a negative pressure irrigation device was proven to be the most efficient in opening dentinal tubes and maintaining them open. It may be posited that the negative pressure allows for a formation of a temporary partial vacuum force, which first draws the liquids from the access cavity into the root canal system and then suctions them out of the system.

Using the macro- and the micro-cannulas of the negative pressure irrigation unit in, correspondingly, the coronal-middle and apical parts of the root canal system, leads to the creation of a vacuum, or a partial vacuum, to be more specific, inside the root canal space. Though its main role is to attract solutions deeper and deeper into the system and safely remove them from within, the partial vacuum created by the negative pressure has a number of other important benefits as Sleiman-Iandolo testing has shown.

First of all, it can eliminate the airlock (better known in endodontics as vapor lock) inevitably resulting from bubbly chemical reactions between irrigating solutions and the dye deeply into the dentinal tubules (Fig. 2a). To compare commonly used irrigant delivery techniques, a negative pressure irrigation unit was used (EndoVac) as well as a lateral-vented needle, manual activation of the solution, and passive ultrasonic irrigation in combination with the Sleiman irrigation sequence. EndoVac + Sleiman sequence was shown to be the only approach that allowed for a complete removal of the methylene blue dye from the entire root canal system and dentinal tubules over the total time of 25 minutes, while the other approaches failed to achieve a completely clean system (Figs. 2b & c).

The Sleiman sequence goes beyond using water as an intermediate between the two alternating solutions and as the final irrigant (water cooled to between 2.5°C and 4°C and used for postoperative pain control or in a cryotherapy modality also suggested. Continued on page 10
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3D Endo Software, glide path management and WaveOne Gold

By Peet J. van der Vyver and Faraana Patel

Radiographic imaging forms an essential part of the diagnosis, treatment planning and follow-up, in modern endodontics. Cone beam computer tomography (CBCT) allows for the visualisation of root canal systems in three dimensions without the superimposition of anatomic structures that occurs with conventional radiographs. CBCT units reconstruct the projection data to produce interrelation images in the axial, sagittal and coronal planes. Due to the higher resolution of limited field of view CBCT units (Fig. 1) their application in endodontics has been expanded. High-resolution CBCT images are ideal for diagnosis of periapical lesions, identification of root fractures and resorption lesions and for the evaluation of root canal morphology, root length and root curvatures.

Dentsply Sirona recently launched 3D Endo Software that allows the clinician to perform pre-endodontic treatment planning of simple and complex endodontic cases, using DICOM (Digital Imaging and Communications in Medicine) data from a CBCT scan. The innovative software allows for the identification of anatomical complexities, design of access cavities, working length measurement, and identification of canal curvatures before the actual procedure. In addition, the software also allows one to choose (from a preloaded database of endodontic file systems), a file or system that will most likely result in optimal canal preparation for that specific shape or diameter of a canal.

The purpose of this article is to demonstrate the benefit of the 3D Endo Software in a complex clinical case that required endodontic treatment. In addition, a different approach to glide path management and root canal preparation for canals that present with multi-planar anatomy will be discussed.

Case report

Preoperative evaluation

The patient, a 25-year-old female, reported with irreversible pulpsitis in the axial plane; and in the sagittal plane, evidence of severe root curvatures were present in the mesiobuccal and distobuccal root canal systems. It was decided to do a more in-depth investigation as a result of this complex anatomy, using the 3D Endo Software (Dentsply Sirona).

3D Endo Software

The data of the limited field of view CBCT scan was exported as a DICOM file and imported into the 3D Endo Software. The 3-D planning of the case was then completed in five easy steps.

In the first step, ‘Diagnosis and Pathology’, the imported scan was reviewed in the axial, sagittal and coronal planes. The software has the ability to present a 3-D reconstructed view where the transparency of the teeth can be changed. (Figs. 4a–4d).

The second step, ‘3D Tooth Anatomy’, involved selecting the tooth to be examined and the entire volume was cropped to only leave the data of interest behind (Fig. 5). In the third step, ‘Canal System’, the number of root canals were identified and each root canal was then mapped separately by identifying the orifice and radiographic apical foramen of each root canal (Fig. 6).

With the fourth step, ‘3D Canal Anatomy’, the software made a proposal of the canal anatomy (Fig. 7), but the operator can make corrections according to the canal configuration that can be viewed in different planes.

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Use of diode laser in the treatment of gingival enlargement during orthodontic treatment

By Dr Carlo Fornaini

In recent decades, we have witnessed the substantial development and expansion of the use of fixed orthodontic appliances. While their application has many advantages, several problems related to the health of the soft tissue may sometimes appear during treatment. In fact, the use of fixed orthodontic appliances may provoke labial desquamation, erythema multiforme, gingivitis and gingival enlargement. Gingival enlargement is a very common complication during orthodontic treatment, but fortunately, it seems to be transitory and generally resolves after orthodontic therapy, even if sometimes incompletely. Gingival overgrowth induced by orthodontic treatment shows a specific fibrous and thickened gingival appearance, different from fragile gingiva with marginal gingival redness common in allergic or inflammatory gingival lesions.

Several clinical studies suggest that orthodontic treatment may be associated with a decrease in periodontal health, causing a hypertrophic form of gingivitis. However, the actual pathogenesis of gingival enlargement is not yet completely understood, although probably involves increased production by fibroblasts of amorphous ground substance with a high level of glycosaminoglycans. Increases in mRNA expression of Type I collagen and up-regulation of keratinocyte growth factor receptor could play an important role in excessive proliferation of epithelial cells and increased development of gingival enlargement, on the basis of some studies, in cases of poor oral hygiene status. However, there is no clear definition on its aetiology, although it is probably associated with the inflammatory response induced by the corrosion of orthodontic appliances, particularly those of nickel, linked to an inflammatory response considered a Type IV hypersensitivity and manifested as nickel-induced allergic contact stomatitis, even if its aetiology has not yet clearly been defined.

The treatment of these conditions is surgical. Histological and histochemical studies have demonstrated that the removal of the gingival papilla can promote the formation of normal connective tissue. Because the classic intervention performed by scalpel has some disadvantages, mainly linked to the discomfort for the patient (e.g. anaesthesia by injection and sutures), there has been great interest in the utilisation of laser technology.

Case report
A 14-year-old female patient was referred to our department by the orthodontists unit because, at the end of fixed orthodontic treatment, she had developed gingival enlargement in the upper arch (Fig. 1), probably related to the fast closure of the spaces associated with very poor oral hygiene due to bleeding during toothbrushing. Just after the removal of the appliance, a topical anaesthetic (EMLA, AstraZeneca) was applied to the gingivae (Fig. 2) and a gingivectomy was performed using a diode laser (XD-2, Fotona) according to the technique of removal of the inter dental papillae (Fig. 3). The parameters used were as follows: a wavelength of 808 nm, 3 W in continuous wave, a 320 µm fibre in contact mode. The intervention had a duration of 375 seconds, and the patient did not feel any pain (Fig. 4). After the intervention, the patient did not take any kind of pain medication, and the healing process was completed in five days (Fig. 5).

Discussion
The first laser appliance was built by Maiman in 1960, and some years later, it was successfully employed in medicine and in oral surgery with several advantages. It may provide excellent incision performance with sealing of small blood and lymphatic vessels, resulting in haemostasis and reduced postoperative oedema. Furthermore, target tissues are disinfected as a result of local heating and production of an eschar layer, which results in a decreased amount of scarring owing to decreased postoperative tissue shrinkage, allowing one to avoid the use of sutures.

Diodes, the last generation of laser used in dentistry, have several advantages, such as reduced cost and size, and offer the operator the possibility to work both in continuous and chopped mode. Based on our experience, we can confirm that this technology may represent a new approach to the resolution of gingival enlargement during orthodontic treatment, with better comfort for the patient during and after surgery. -DT

The effect of partial vacuum on ...
Continued from page 6
by Sleiman and investigated by Vera et al.—it also stipulates when using the macro- or the micro-canna of the negative pressure irrigation unit for chemical preparation, every five seconds a two-to-three-second pause should be made when no irrigant is added. It is during this pause that the partial vacuum is created by the cannula, which will draw out all the fluids, residues and gases from all the root canal system. Once the system has been drained, the partial vacuum established inside the root canal system in its entirety can attract a fresh portion of irrigant for a faster and cleaner preparation of the root canal system.

Clinical cases
In the images above, we present some of the typical cases demonstrating the cleanliness of the root canal system achieved as shown by the lateral and/or accessory canals visualised upon 3-D warm vertical condensation (Figs. 3–6).

The case of a failing root canal treatment with apical infection and an internal resorption in the apical area was referred to us (Fig. 7). After removing the previous filling, chemical preparation was performed, with the help of the partial vacuum, inside the system the chemicals were able to clean the resorption area without an aggressive effect on the periodontal ligament; this has led to a truly three-dimensional obturation. The 4-month follow-up image (Fig. 8) confirms a fast healing of both the apical area and the area of the resorption lesion.

Conclusions
Realising that a 100 percent disinfection of the root canal space remains unattainable, we continue to strive for perfection in our attempts to develop viable clinical protocols that would allow lowering the inflammatory and/or bacterial load so that our patients’ bodies can heal. Based on the supporting research and testing as well as on a history of sustainably high treatment outcomes for both primary endodontic treatment and retreatment of vital and non-vital teeth, we would like to propose our irrigation protocol as a fast, safe, and, most importantly, evidence-based technique of chemical preparation.

The Sleiman irrigation protocol requires 6 percent (or 5.25 percent, if the 6 percent concentration is not available) NaOCl, 17 percent EDTA, distilled water or normal saline. For the best results it is recommended to use a negative pressure irrigation unit to introduce and remove the solutions in order to benefit from the partial vacuum force; however, it must be said that using other introduction techniques in combination with the Sleiman sequence of irrigants will also improve chemical preparation results and lead to a cleaner root canal space.

- Access cavity; manual files to locate orifices; manual files for initial scouting—NaOCl
- H2O
- Machine files for root canal preparation—EDTA
- In between machine files—NaOCl
- H2O (cold for caryotherapy)
- Drying the root canal system—EndoVac

The whole irrigation procedure should follow the '5 sec introducing solution + 3 sec pause' guideline to achieve the best effect of the partial vacuum. -DT
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3D Endo Software, glide Irrigation (VWD) driven by an air scaler (SONICflex LUX 2000L, KaVo). Thereafter, final disinfection was achieved by activating 3.5 %, heated sodium hypochlorite for three minutes, followed by irrigating with the EDDY Endo Irrigation Tip.

The canals were dried with paper points and obturated using matching gutta-percha points, Pulp Canal Sealer (Kerr) and the Calamus Dual Obturation Unit (Dentsply Sirona). Figure 28 shows the final result after obturation.

Discussion
According to the European Society of Endodontontology’s position statement, the use of CBCT in endodontics should only be considered if additional information from the reconstructed three-dimensional images will potentially aid in the diagnosis and/or enhance the management of the tooth with an endodontic problem. A limited field of view (FOV) can scan smaller areas to be considered as the imaging modality of choice for teeth with the potential for extra canals and suspected complex root canal morphology.

The 3D Endo Software that was used in this case report not only allowed the operator to scroll through the tomographic slices in the coronal, axial and sagittal planes, but facilitated a 3-D image of the root canal anatomy prior to treatment. Only after visualising the severe curvatures and the ProGlider instrument in the buccal plane did the direction of this case realised. This information was vital for the treatment-planning phase of this case. According to the information obtained from the 3D Endo Software, the authors could select the ideal instruments for canal negotiation, glide path and canal preparation, irrigation and obturation. According to Tchorz (2017), the option to plan endodontic cases in 3-D before the canal file descends will result in a significant gain for modern endodontics, and can help to prevent procedural errors, especially in complex cases. It is important to note that in this case report the working length measurements obtained from the 3D Endo Software and the apex locator correlated with each other. However, it always advised to verify the software readings with an apex locator, as several parameters such as the access cavity design and position, the amount of coronal preflaring and the choice of reference point can have an influence on the working length measurement.

The most challenging clinical aspect of this case was to negotiate the canals to patency, to create reproducible micro-glide paths to a level where the maximum safety could be secured before introducing the root canal preparation instruments. The glide path preparations were managed with use of K-Files in a 2-3-2 sequence, with the reciprocating M4 handpiece followed by expanding the glide paths with the ProGlider and the WaveOne Gold Glider instruments.

In 2006, West recommended using K-Files with an initial watchticking motion to remove restricted dentin in the narrow canals which is followed by a vertical in and out motion with a 1 mm amplitude and gradually increasing the amplitude as the dentine wall wears away and the file advances apically. [11] Several authors have described the use of a small K-Files driven by a reciprocating handpiece for initial glide path preparation, especially in very constricted or curved canals. The main advantages of using the reciprocating M4 handpiece is to reduce the glide path preparation time, hand fatigue, and to secure the canal in narrow, multi-planar root canals faster compared to the conventional manual technique. Securing the two multi-planar buccal root canal systems in this case, with a size 08 K-File in the M4 reciprocating handpiece, enabled the operators to scan safely and facilitate further glide path enlargement.

The ProGlider, a single file rotary glide path instrument was the first instrument used to expand the glide paths. This file is manufactured from M-wire NiTi alloy that is square and the file is used in a continuous rotary motion at 300 rpm and a torque setting of 2–4 Ncm. Considering the severe curvatures in different planes of the buccal root canal systems, the ProGlider instrument was first used in a manual mode up to working length in these two canals. It was also then decided to further expand the glide path in these canals by using the WaveOne Gold Glider, also a single file rotary glide path instrument, to secure the canal and for glide path enlargement. Here, a second glide path instrument was used because the cutting envelope of the WaveOne Gold Glider is more than the ProGlider instrument (Fig. 30). The rationale for this double file approach for glide path expansion was to enhance safety for the preparation that followed.

The file tip of the WaveOne Gold Glider at D0 has a ISO 015 tip size with a 2 % taper, and the taper progressively increases up to 6 % (D14; Fig. 29). The cross section of the instrument is square and the file is used in a continuous rotary motion at 300 rpm and a torque setting of 2–4 Ncm. Considering the severe curvatures in different planes of the buccal root canal systems, the ProGlider instrument was first used in a manual mode up to working length in these two canals. It was also then decided to further expand the glide path in these canals by using the WaveOne Gold Glider, also a single file rotary glide path instrument, to secure the canal and for glide path enlargement. Here, a second glide path instrument was used because the cutting envelope of the WaveOne Gold Glider is more than the ProGlider instrument (Fig. 30). The rationale for this double file approach for glide path expansion was to enhance safety for the preparation that followed.

The file tip of the WaveOne Gold Glider at D0 has a ISO 015 tip size with a 2 % taper, and the taper progressively increases up to 6 % (D14; Fig. 29). The file has a semi-active tip and a parallelogram-shaped cross-section. The WaveOne Gold Glider is manufactured using NiTi wire subjected to a post-manufacturing heat treatment process, which elongates the wire. The transition point between martensite and austenite is identified to produce a file with super-elastic NiTi metal properties. This process gives the file a gold finish with enhanced flexibility and a 1.5 times higher cyclic fatigue life compared to conventional NiTi and M-Wire alloys. The WaveOne Gold Glider was driven by the X-Smart motor, on the WaveOne setting. The file was taken up to working length in the already secured and expanded glide path and the glide path was further expanded using a 4-8 backstroke brushing motions, until the file felt completely loose in the challenging canal system.

The WaveOne Gold Primary and Small files were selected for root canal preparation in this case. These files are manufactured with NiTi alloys as described above for the WaveOne Gold Glider, to produce a file with super-elastic NiTi metal properties. The WaveOne Gold Primary file (Dentsply Sirona) is 30 % more resistant to cyclic fatigue, 80 % more flexible, and 23 % more efficient than the conventional WaveOne Primary instrument. This unequal clockwise (CW) and counter-clockwise (CCW) reciprocating motion of the WaveOne Gold system has the following advantages over continuous rotation systems:

- Binding of the instruments into the root canal dentinal walls is less frequent, reducing torsional stress.
- Reduction of the number of cycles within the root canal during preparation results in less fluxular stress on the instrument.
- Improved safety, as the CCW disengaging angle is designed to be less than the elastic limit of the instrument.
- There is decreased risk of instrument fracture.
- It also allows the file to easily progress towards working length without using potentially dangerous inward pressure.

WaveOne Gold files are characterised by a parallelogram (with two 85 degree cutting edges), off-centred, cross-section.According to Ruddle, this design limits the engagement between the file and the dentine to only one or two contact points at any given section. This will subsequently reduce taper lock and the screw-in effect, improve safety, and cutting efficiency. The newly designed files is also manufactured with an ovular, roundly tapered and semi-active guiding tip to ensure that the files progress safely along canals with a secured and confirmed reproducible glide path.

Conclusion
The preoperative planning stage using the 3D Endo Software provided the authors with vital information regarding the complex root canal anatomy that influenced the choice of materials and techniques in this case report. Because the root canal anatomy was deemed to be challenging, and given the fact that the authors were preoperatively, the authors realised that there would be a high risk of either losing working length or instrument fracture during canal preparation. It was therefore very important to secure the canals by means of glide path preparation and enlargement prior to root canal preparation.
Genetic mutation from last ice age linked to shovel-shaped incisors

DT International

ERKELEY, Calif., U.S. - Scientists have been puzzled by the evolutionary adaptation behind a common tooth trait of northeastern Asians and Native Americans: shovel-shaped incisors. An analysis of archeological specimens carried out by researchers from the University of California, Berkeley has shown that nearly all early Native Americans had shovel incisors, and genetic evidence pinpointed the selection to a long period of isolation in the far north 20,000 years ago.

The critical role that breastfeeding plays in infant survival may have led, during the last ice age, to common genotypes in some regions and Native Americans that also affect the shape of their teeth. According to the researchers, this genetic mutation, which probably arose 20,000 years ago during a period referred to as the Beringian standstill, increases the branching density of mammary ducts in the breasts, potentially providing more fat and vitamin D to infants living in the far north, where the scarcity of ultraviolet radiation makes it difficult to produce vitamin D in the skin. It just so happens that the gene controlling mammary duct growth also affects the shape of human incisors.

Consequently, as the genetic mutation was selected for in an ancestral population living in the far north during the last ice age, shovel-shaped incisors became more frequent too. Incisors are called "shovel-shaped" when the lingual and palatal surfaces of the incisors have ridges along the sides and incisal edge.

"For the first time, Leslie Hlusko, an associate professor in the Department of Integrative Biology at the university, and her colleagues assessed the occurrence of shovel-shaped incisors in archæological populations in order to estimate the time and place of evolutionary selection for the trait. They found that nearly 100 percent of Native Americans prior to European colonization had shovel incisors, as do approximately 40 percent of East Asians today.

"The genetic mutation responsible for shoveling and ducial branching in mammary glands is also involved in determining the density of sweat glands in the skin and the thickness of hair shafts. As a consequence, selection on one trait leads to coordinated evolution of the others."

"The Beringian standstill describes the several thousand-year period of isolation of ancestral Native Americans in an area known as Beringia—today consisting of the Bering Strait and adjacent parts of Siberia and Alaska— that resulted in genetic differentiation from other Asian groups. Genetic studies of animals and plants from the Beringia region suggest an isolated area during that time where species with locally adaptive traits arose. Such isolation is suitable for selection on genetic variants that make it easier for plants, animals and humans to survive. People have long thought that this shoveling pattern is so strong that there must have been evolutionary selection favoring the trait. This Beringian population is one example of what has happened thousands of times, over millions of years: Human populations form, exist for a little while and then disperse to form new populations, mixing with other groups of people, all of them leaving traces on modern human variation today. An important take-home message is that human variation today reflects this dynamic process of ephemeral populations, rather than the traditional concept of geographic races with distinct differences between them," said Hlusko.

40th APDC held in Manila

Continued from front page

Dental professionals, continually strive for excellence in whatever field of specialty we may be into. Featured in this convention are renowned local and foreign speakers from every specialty field, who will bring in their expertise through noteworthy lectures that are relevant and timely to our dental practice.

Dr. Aileen R. Reyes, Philippine Dental Association President-Elect

The conference had a distinguished lineup of speakers including Regional and international experts coming together to lead a dynamic scientific programme, plenary sessions, lunch symposia, and hands-on workshops specifically tailored to the region's dental practitioners at all career stages. The state-of-the-art scientific programme, along with over 500 dental trade booths provided the participants with an opportunity to hear firsthand from the world’s leading experts in dentistry and to inspire the advancement of the profession in their home countries.

Manila, known as the 'Pearl of the Orient', is center of the country’s government and commerce and is filled with important architectural and cultural landmarks. An elaborate social programme was organized for which the attendees were recommended to register beforehand.

Sindh Budget 2018-19

Continued from page 2

2 Regional Blood Transfusion Centers at Sukkur and Jammshoro have been outsourced to Sukkur Blood Bank and Indus Hospital, respectively.

Grants: Sindh Government is granting Rs 5.59 billion to SIUT within the next financial year (2018-19). It includes establishment of SIUT at Larkana with an allocation of Rs 497.5 million. SIUT Sukkur chapter has been established at the cost of Rs 552.27 million. This institute has been functionalized to provide affordable OPD, Diagnostic, Dialysis and other specialized services. Bone Marrow Transplantation Unit in SIUT established at the cost of Rs 692.779 million, which is equipped with state-of-the-art infrastructure and facilities, benefiting 50-100 patients. Child Life Foundation is managing children emergency rooms in 3 Government Hospitals under PPP agreement which includes, Dr. Ruth Pfau Civil Hospital Karachi, National Institute of Child Health and Sindh Government Hospital Karangi No.5.

By May 2018, Child Life Foundation would start operation at 2 more emergency service centers in Abbasi Shahed Hospital and Lyari General Hospital in Karachi. By June 2018, Child Life would begin ER operations in 2 more facilities: Peoples Medical College, Nawabshah and Chandka Medical College, Larkana. Lastly by the end of 2018, Children ERs would also become functional at Ghalam Muhammad Mahal Medical College, Sukkur and Liaquat University of Medical and Health Sciences, Jamshoro.

Furthermore, he added that, Sindh is facing challenges of malnutrition, as 48 percent children in Sindh are undernourished and stunted. Sindh Government, in collaboration with World Bank, has begun a multi-sectoral program to reduce the rate of stunting in children with the aim to reduce it by 30% within the next 5 years.

"Rs 2.4 billion are allocated for the non-development side, in the year 2017-18. CM proposed an allocation of Rs 5.1 billion in the next year. The major departments responsible for this program are Health, Agriculture, Livestock and Fisheries, Local Govt. Social Welfare."

"A new allocation was proposed in the budget, for additional Centre for Chemical and Biological Sciences for strengthening Jamil-ur-Rehman Centre for Genome Research at the University of Karachi to establish a DNA Lab. Funds were allocated in the budget to improve Cardiology Department at Lyari General Hospital; to establish Institute of Ophthalmology & Visual Sciences Hyderabad; to construct 200-bed Surgical Block at Liaquat University Hospital; to construct 200-bed Urology, Nephrology, Gastroenterology, Endoscopy, Suite, Dermatology, endocrinology and Diabetes Block, Luh, Jammshoro; to establish NICVD Satellite Centre at Shaheed Benazirabad. To rehabilitate and strengthen Nursing Hostel, Obstetrics & Gynaecology Department, O.T., External Development and Missing Facilities at Sheikh Zayed Campus, CMCH, Larkana; to construct Building of Nursing School & Hostel Mirpurkhas; to up-grade Rural Health Centre to the level of Taluka Hospital Khanpur in District Shikarpur; to strengthen Development wing including Capacity Building of officers/officials of Health Department."

Indus Hospital Badin: The initiatives brought about remarkable improvement in the provision of public health service, including OPDs, IPDS, surgeries etc. The management of DHO Badin was handed over to Indus Hospital, under the PPP mode in March, 2016 and very soon, people of Badin will see a new 250-bed health facility.

ICD-Honouring the world's ... Continued from page 4

We have already touched on the ideas of friendship and passion of ICD Fellows. What is the main ingredient of the ICD's success to you? Dedication and commitment to ICD core values is the common denominator, ICD Fellows are driven as individuals and as a group to improving dentistry and the life of those being underserved. One sees that everywhere we have an ICD presence.

"The celebration of the 100-year anniversary is planned to be a worldwide event; every section, district and region will be holding events. Can you tell us a bit more about what we can expect before the grand finale in Nagoya in Japan in 2020?"

As mentioned earlier, we have 15 sections, 70 districts and 15 regions worldwide, and they will be participating in different ways to acknowledge the 100-year anniversary. Every ICD jurisdiction will have its own way of celebrating this special year and will lead up to the very special finale in Nagoya in November 2020. There will be a ceremony in Nagoya in which new inductees from all over the world will participate in an Olympic-style event, in addition to a gala banquet, special entertainment and many surprises! - DT
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