

DENTAL TRIBUNE

The World's Dental Newspaper • Pakistan Edition



PUBLISHED IN PAKISTAN

www.dental-tribune.com.pk

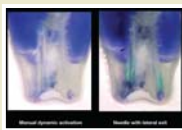
MAY, 2018 - Issue No. 03 Vol.5



Over Rs. 96 Billion
Earmarked for
Health Sector

NEWS

► Page 2



The effect of partial
vacuum on the
chemical ...

CLINICAL ENDODONTICS

► Page 6



3D Endo Software,
glide path
management and ...

CLINICAL ENDODONTICS

► Page 8

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 life time 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 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

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

KARACHI - Sindh 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 RHCs, 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.

EPI 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 982.31 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 8.094 billion for next financial year.

Initiatives under PPP: Murad Shah said that 1,213 health facilities have been outsourced on performance based management contract, which include 1,049 facilities to PPHI and 158 facilities outsourced 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*



PDA Plaque to APDF Secretary General, Dr Oliver Hennedige



PDA Plaque to APDC Chairman, Dr Villareal (Philippines)



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



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

PDA Gives International Awards in Manila APDC

DT Pakistan Report

Pakistan 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



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



PDA Plaque to Prof Dr S.M. Balaji (India)

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.

DENTAL TRIBUNE

The World's Dental Newspaper • Pakistan Edition

Publisher/CEO

Syed Hashim A. Hasan
hashim@dental-tribune.com.pk

Editor Clinical Research

Dr. Inayatullah Padhiar

Editors Research & Public Health

Prof. Dr. Ayyaz Ali Khan

Editor - Online

Haseeb Uddin

Designing & Layout

Sh. M. Sadiq Ali

Dental Tribune Pakistan

3rd floor, Mahmood Centre, BC-11, Block-9
Clifton, Karachi, Pakistan.
Tel.: +92 21 35378440-2 | Fax: +92 21 35836940
www.dental-tribune.com.pk
info@dental-tribune.com.pk

Dental Tribune Pakistan cannot assume responsibility for the validity of product claims or for typographical errors. The publisher also does not assume responsibility for product names or statements made by advertisers. Opinions expressed by authors are their own and may not reflect of Dental Tribune Pakistan.

International Imprint

Publisher/President/CEO	Torsten R. Oemus
Chief Financial Officer	Dan Wunderlich
Director Content Creation	Claudia Salwiczek-Majonek
Senior Editor	Yvonne Bachmann
Clinical Editors	Nathalie Schüller Magda Wojtkiewicz
Editor & Social Media Manager	Monique Mehler
Editors	Kasper Mussche Brendan Day
Junior Editors	Franziska Beier Luke Gribble
Copy Editors	Ann-Katrin Paulick Sabrina Raaff
Junior Business Development & Marketing	Alyson Buchenau
Digital Production Manager	Tom Carvalho
Junior Digital Project Managers	Hannes Kuschick
Project Manager Online	Chao Tong
IT & Development	Serban Veres
E-Learning Manager	Lars Hoffmann
Project Manager CME	Sarah Schubert
Product Manager Surgical Tribune & DDS.WORLD	Joachim Tabler
Sales & Production Support	Nadine Dehmel Nicole André
Accounting	Karen Hamatschek Manuela Hunger
Database Management & CRM	Annachiara Sorbo

Media Sales Managers
Antje Kahnt (International)
Melissa Brown (International)
Hélène Carpentier (Western Europe)
Matthias Diessner (Key Accounts)
Weridiana Mageswki (Latin America)
Barbora Solarova (Eastern Europe)
Peter Witteczek (Asia Pacific)

Executive Producer Gernot Meyer

Advertising Disposition Marius Mezger

Dental Tribune International

Holbeinstr. 29, 04229 Leipzig, Germany
Tel.: +49 341 48 474 302 | Fax: +49 341 48 474 173
info@dental-tribune.com | www.dental-tribune.com

©2018, Dental Tribune International GmbH. All rights reserved. Dental Tribune International makes every effort to report clinical information and manufacturer's product news accurately, but cannot assume responsibility for the validity of product claims, or for typographical errors. The publishers also do not assume responsibility for product names or claims, or statements made by advertisers. Opinions expressed by authors are their own and may not reflect those of Dental Tribune International.

How can you get all your patients

Totally Ready

For 12 Hour Mouth
Protection?



With whole mouth health protection

✓ **TEETH** ✓ **TONGUE** ✓ **CHEEKS** ✓ **GUMS**

With an ordinary fluoride toothpaste, patients can only get fluoride protection for teeth, which are just 20% of mouth surfaces.¹

Significant bacterial reduction on

100% of mouth surface, in 100% of patients^{2,3}

- Bacteria reduced by 50% on teeth, tongue, cheeks and gums
- Results shown 12 hours after brushing

Help all your patients achieve Whole Mouth Health with Colgate Total®

References: 1. Collins LMC, Dawes C. *J Dent Res*. 1987;66:1300-1302. 2. Fine DH, Sreenivasan PK, McKiernan M, et al. *J Clin Periodontol*. 2012;39:1056-1064. 3. Data on file. Data analysis from reference 2: analysis of antimicrobial effect of 3 toothpastes on teeth, tongue, cheeks and gums. Reductions shown represent ≥ 50% bacterial reduction on 100% of mouth surfaces.



ICD—Honouring the world's leading dentists since 1920

By Nathalie Schüller

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 Ottofy and Tsurukichi Okumura with the vision to start an organisation of outstanding dentists to maintain professional collegiality and friendship, monitor and evaluate the progress of dentistry internationally, and disseminate such information to dentists worldwide.

Today, the ICD has 12,000 fellows in 122 affiliated countries, from a diversity of cultures and social backgrounds and with different professional experiences. It aims to recognise their outstanding contributions to the dental profession in upholding the college core values of leadership, recognition, humanitarianism, education and professional relations. On behalf of Dental Tribune Online, I had the pleasure of speaking with Dr Dov 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, and based on my 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 regent, 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, so 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 the absence of an atmosphere of competition and the need to show how successful one is or how many papers one has published. This is uncommon in many professional associations. I feel everybody is aware of and appreciates this unique aspect of the ICD. The ICD promotes a collaborative, sharing relationship guided by the universal principle that all members are equals regardless of

their national origin, culture or language.

Are all potential members nominated by fellows?

Yes, one has to be nominated by two fellows in good standing. Let's say a candidate lives in Germany. Two members of the college would have to recommend the person to the German District committee, who, following the recommendation from the credential review committee, would pass the recommendation on to the full European Section board (consisting of all 35 European member countries) for a vote on the nomination. The decision would then be passed on to the ICD world headquarters for completion of the process and preparation of certificates. So, the process does take time, but that is to ensure thorough scrutiny of requirements and documentation inherent in the peer-review procedures. **What is the basic requirement to be nominated? Are accomplishments in dentistry, humanitarian work or both required?**

Nominees have to have made major contributions to dentistry in more than one of the following areas: academia/teaching, research, humanitarian programmes, leadership or service projects. In other words, they must have had a significant impact on dentistry and society.

What is your major joy, your main motivation, in being part of the ICD?

As the International Editor and Director of Communications, I see all of the reports and images of ICD events and projects that take place around the world.

I have to select the ones that will appear online and in our journal. That is why I sent you a photo of the 2015 issue of The Globe, the ICD journal. In this photo, one can truly see the kind of impact so many of our projects have on the people who are the recipients of ICD compassion and dedication. It is evident in their eyes—a palpable image of someone's unselfishness, caring for another human being, some receiving care for the very first time in their lives.

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

Oral disease 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 can 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 project site's population.

How are ICD projects initiated?

There are many kinds of projects. Some are directly funded through the ICD's Global Visionary Fund. Also, there are 15 sections of the college and 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 programmes teaching dentists how 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 well-known organisation; in fact, many dentists are unaware 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



FDI President Dr Kathryn Kell and Philips CEO of Business Group Health and Wellness Taiwan's Minister of Health Chen Shih-Chung (left), with Dr Dov Sydney (right), at the kick off to the Centennial campaign. Sinéad Kwant

that the ICD core values are sustainable and worthy. The projects, the organisation and the dedication of our members to improving oral health care are only possible because our fellows deeply believe 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 bit of his independence, not be able to give the message he wanted to give. In financing all these projects, your collaborations with companies, can you still stay independent and choose what is the best in keeping with the ICD's values?

We have various levels of sponsorship. We collaborate with companies like Henry Schein, Modern Dental Group, Dentsply Sirona, Spident, Hu-Friedy and EMS, as well as organisations like the International Congress of Oral Implantologists, that provide us with their generous support. When we take on a sponsor, it is not as an advertiser, but as a partner in a strategic alliance of shared values. That alliance has various parameters and mutual responsibilities that create a unique symbiotic relationship between the college and our corporate sponsors. **What do you think are the major challenges facing the college today?**

All major organisations in dentistry are seeking new members. Some have little or no oversight or require little, if any, performance evidence as a prerequisite to membership, unlike the ICD, whose requirements are considered of the most stringent of all recognition-based international dental honour societies. Quite frankly, some try to imitate how the ICD operates, and why not? The ICD is in the enviable and unique position of having recorded sustained membership growth for the last ten years. We have a strong and consistent contact relationship with our members by focusing on meeting fellows' needs, staying relevant and consistently seeking out new and innovative methods to enhance our communications and connection with them.

But, with the constant bombardment of information via the Internet and e-mails, there are many challenges and media competition for our members' attention. We are meeting those challenges with innovative communication packaging, but it's a constant and unending endeavour.

Continued on page 15



REPAIR & PROTECT

ACTUALLY HELPS REPAIR SENSITIVE TEETH*

Cause of
sensitivity pain

Tiny holes
in dentine

A hard
layer

Repairs
these holes

Helps protect
from pain



No.1 DENTIST RECOMMENDED BRAND FOR SENSITIVE TEETH

*Forms a protective layer over the sensitive areas of the teeth. Brush twice a day for lasting sensitivity protection.

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 Zürcher demonstrated root canal anatomy with an unprecedented visual clarity, its complexity has fascinated researchers armed with ever better imaging tools—from blue dyes 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

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

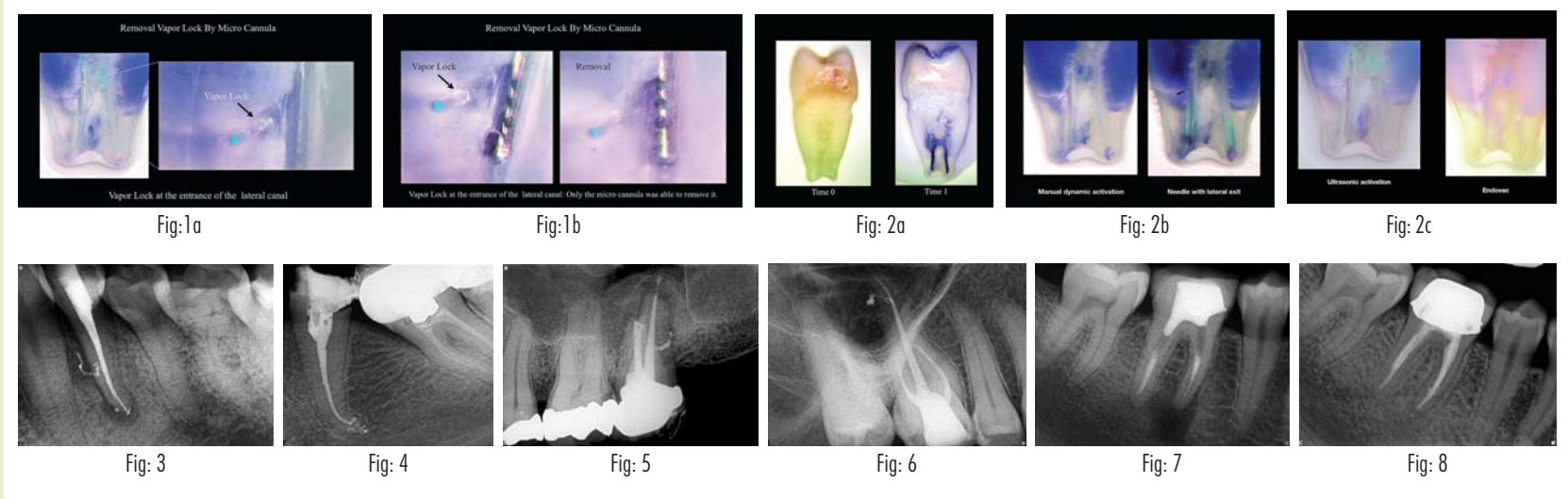
The fact that during root canal shaping the system may get blocked by debris led to the question of how to best conduct the chemical preparation so that the dentinal tubules remain open to allow for a better cleaning and, consequently, sealing of the system. Drawing from clinical experience and improved outcomes, Jaramillo et al. have formulated an

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, carcinogenic) 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

content of the root canal space inside the main canal—mainly in the apical part—as well as inside lateral canals and dentinal tubules and preventing the irrigants from reaching these areas and performing their best (Figs. 1a and b). Secondly, once the airlock is eliminated, the partial vacuum force helps in distributing irrigants into the totality of the root canal system, including the depth of the dentinal tubules. Thirdly, negative pressure irrigation allows for introducing a significantly larger volume of irrigating solutions over a shorter period of time, increasing the efficiency and decreasing the length of the procedure. These unique properties result in a faster and better chemical preparation of the entire internal space.

Sleiman-landolo testing used freshly extracted premolars, removed due to periodontal pathology, impregnated with methylene blue dye in a centrifuge; this resulted in pushing the



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

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 emphasised 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

tubules 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-landolo 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

HELP KEEP YOUR PATIENTS ON A JOURNEY TO HEALTHY GUMS

PARODONTAX® TOOTHPASTE IS CLINICALLY PROVEN TO REDUCE PLAQUE, BLEEDING GUMS AND INFLAMMATION

4X

greater plaque removal*¹

48%

greater reduction in bleeding gums*¹

Recommend parodontax® toothpaste to help patients maintain their optimal gum health between dental visits.



3D Endo Software, glide path management and WaveOne Gold

By Peet J. van der Vyver and Farzana Paleker

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 interrelational 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

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 pulpitis on

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).

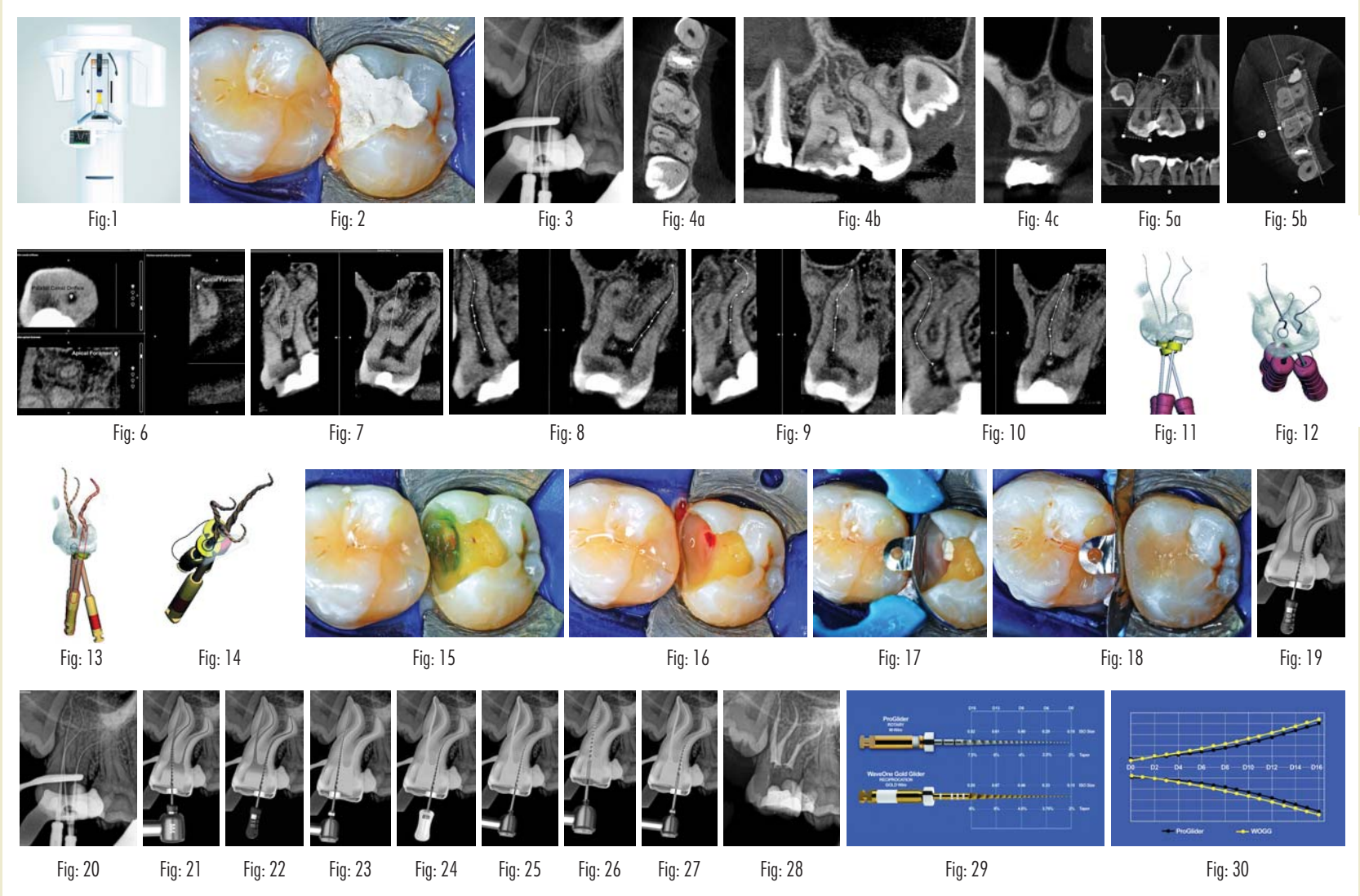
3D Endo Software

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

in the software. Figures 8 to 10 show the mapping of the palatal, mesiobuccal, and distobuccal root canal systems.

During the fifth step, 'Treatment Plan', the software projected ISO size 06 instruments into the canals (Fig. 11), which allowed the operator to visualise the internal anatomy of the canals, check straight line access, and modify the proposed access if necessary. A rubber stop on the files can then be digitally adjusted to a coronal reference point of choice that will then indicate the proposed working length for each root canal system. This view can also be rotated in 3-D to alert the operator of the angle and direction of curvatures in the root canal systems (Fig. 12). The step after 'treatment plan' is to select



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

her maxillary second left molar. The tooth was temporarily restored with Intermediate Restorative Material (IRM, Dentsply Sirona) and the patient complained about continuous food impaction between her maxillary left, first and second molar teeth (Fig. 2). A periapical radiograph revealed that the temporary restoration was not sealing at the gingival margin (Fig. 3). Also, visible on the periapical radiograph was evidence of possible curvatures in the mesiobuccal and distobuccal roots. It was decided, with the consent of the patient, to take a limited field of view CBCT scan to explore the anatomy of this tooth. The CBCT scan revealed the presence of three root canal systems when viewed

view where the transparency of the teeth can be changed (Figs. 4a–d).

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

a master file from a preloaded database of endodontic file systems that will most likely result in optimal canal preparation for that specific shape or diameter of a canal. Considering the s-shaped curvatures in all three root canal systems as well as the sharp curvatures in different planes, it was decided to use the Primary WaveOne Gold file (25/07) in the palatal canal and the Small WaveOne Gold file (20/07) for root canal preparation in the two-challenging buccal root canal systems (Fig. 13). The selected instruments were then displayed in the root canal systems and the operator again digitally rotated and visualised the root canal anatomy in 3-D (Fig. 14).

Continued on page 14

Buenos Aires Argentina

5-8 September 2018

A PASSION FOR MANY, A COMMITMENT FOR ALL



30 March 2018

ABSTRACT SUBMISSION
DEADLINE

1 June 2018

EARLY-BIRD
REGISTRATION DEADLINE

www.world-dental-congress.org