Quality of UK dental services remains high

Overall majority of providers achieving good or outstanding rating from CQC

By DTI

LONDON, UK: Only one per cent of all dental practices inspected by the Care Quality Commission (CQC) in 2015 and 2016 required enforcement action for not meeting the regulator’s criteria. The overall majority were found to deliver high-quality care, the body announced in its State of Care report issued last week.

At least nine out of ten practices complied with the CQC’s five key tests for being caring, responsive, well led, safe and effective.

Of the five core community services, which include services for children, young people and families, as well as for adults, and in-patient services and community end-of-life care, dentistry was found to deliver the highest care, with 86 per cent of all inspected providers achieving a rating of good or outstanding from the CQC.

The results were based on almost 10,000 dental care inspections the CQC conducted during the last two years in dental practices around the UK. Of those, only ten per cent needed to make improvements in fields like leadership and safety, the organisation said.

“As in other sectors, where there is a realistic prospect of the dental practitioner’s fitness to practise being impaired, case examiners will have the opportunity to refer the case to one of the three Practice Committees.”

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High evaluations could slow down acquisitions

By DTI

LONDON, UK: Another rise in practice valuations in the UK could mean that practices in the South East and London will find it increasingly difficult to find buyers, the National Association of Specialist Dental Accountants and Lawyers (NASDAL) has warned. Evaluations in these regions have reached such a level that many potential acquirers can no longer pass the affordability test, London-based NASDAL accountant Ajay Patel recently said in a press release.

“Only those with substantial personal capital, private equity-backed dental companies or individuals with the help of ‘Bank of Mum and Dad’ can afford to acquire in many instances,” Patel said. “I have recently seen more and more potential acquirers, although meeting the bank’s serviceratio, test level payment for the acquire.”

“Projects in many instances demonstrate the acquire would earn less after loan servicing cost than they do currently as associates,” he added.

According to the latest quarterly goodwill survey conducted by NASDAL, valuations in the period of April to July saw another rise over the previous quarter to goodwill of 158 per cent of gross fees despite the Brexit and the economic uncertainty it created. While the average of 107 per cent has seen a 3.7 per cent surge in the last three months, one practice in the West Country in particular reported having achieved goodwill in excess of 206 per cent of gross fees.

“Only those with substantial personal capital, private equity-backed dental companies or individuals with the help of ‘Bank of Mum and Dad’ can afford to acquire in many instances,” Patel said. “I have recently seen more and more potential acquirers, although meeting the bank’s servicing ratio, test level payment for the acquire.”

The greatest jump, however, was in the value of deals for private practices, according to the report.

“Whilst it must be stressed that the EU referendum vote happened midway through the quarter, it does appear that the vote had, at worst, no effect or arguably a positive effect on the value of UK dental practices,” summarised specialist dental accountant and partner at UNW Alan Suggett, who compiles the goodwill survey.

BOS: New app at Brighton congress

By DTI

BRIGHTON, UK: In late September, hundreds of orthodontic specialists gathered at the Brighton Centre for the 2016 British Orthodontic Conference (BOC). On the occasion, the British Orthodontic Society (BOS) announced the launch of a new app aimed at helping dental professionals and their patients.

The EASY IOTN app uses simple clinical features to guide the user to the correct classification via the quickest possible route, according to Dr Guy Deeming, who led the development team at the specialist body. With a simple interface that is easy to navigate, it is aimed at improving the standard and accuracy of orthodontic referrals, as well as supporting the training of undergraduates and foundation dentists, he said.

According to the BOS, the IOTN is often applied incorrectly owing to its complexity. “We wanted to simplify and streamline the scoring process, as well as support the training of dentists,” Deeming commented on Friday morning. “This is no substitute to calibration, but we hope it will be a useful adjunct for dentists.”

Included in the app is a continuing professional development (CPD) and training section that will provide one hour of verifiable CPD for the user. According to Deeming, an Android version is scheduled to be launched by the end of the year.

Also announced were the date and venue of the next BOC, which will take place from 24 to 16 September 2017 at the Manchester Conference Centre. Themed ‘Back to the future’, the event will feature more than 40 prominent speakers, including Drs John Schuckert and Nigel Hartardine, who will be sharing their ideas regarding the future development of the field. Special focus will be on digital technology, material design and other innovations.

2016 congress chairperson Dr Richard Jones said: “In addition to the orthodontic technician and dental team programmes, the 2017 BOC will offer three full-scale orthodontic programmes throughout the three days of the event.”

This year’s BOC was held from 23 to 25 September in Brighton.
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Queen Mary makes headway in development of tooth-repairing fillings

By DTI

In May, the first toothpaste containing bioactive glass was introduced to the public at Queen Mary University of London. Recently, a group of researchers from the university’s Institute of Dentistry has reported new data that demonstrate the material has the potential to prohibit the formation of bacteria that cause cavities and repair it through remineralisation when used in dental fillings.

According to Prof. Robert Hill, who led the group, the bioactive glass composite remineralised partially decayed teeth and created an alkaline environment that discouraged the bacteria that caused the initial decay. It also filled in the gaps with tooth mineral, thus preventing the oral bacteria that cause cavities from establishing themselves.

“Research in the UK suggests this will potentially prolong the life of fillings and slow secondary tooth decay because the depth of bacterial penetration with bioactive glass fillings was significantly smaller than for inert fillings,” he said.

A new material able to repair teeth would provide the possibility of replacing the potentially toxic material and would mean a significant step forward in tooth restorative materials, according to Hill.

“There is huge pressure to eliminate mercury-based amalgam fillings by offering aesthetic white fillings which help heal the tooth,” commented CEO of BioMin Technologies Richard Whalley, who licensed the technology from Queen Mary Innovations. “We plan to translate the remineralising technology developed with the BioMinF toothpaste into restorative dental products.”

Toothpaste with bioactive glass has been available on the market since May this year. Using this type of bioactive glass composite to fill cavities eliminates the need to use mercury-based amalgam by offering aesthetic white fillings which help heal the tooth.

Bioactive glass slowly dissolves ions that form fluorapatite, a mineral also found in shark teeth, over an 8–12-hour period to make teeth more resistant to acids from food. According to Hill, the process has been proven to be more effective than the use of fluorides in conventional toothpastes or professional prophylaxis materials, which are washed away and lose their effect more quickly. In addition, the fluorapatite formed from brushing with BioMinF toothpaste has been shown to effectively reduce dentine hypersensitivity by sealing open dentinal tubules in vitro studies at Queen Mary.

UK men concerned about their teeth

By DTI

The look of their teeth is of great importance to British men. More than a quarter would investigate means of changing them if they had concerns in this regard, it also found. A significant 69 per cent of men would investigate means of treatment to have their teeth aligned if they had concerns in this regard, it also found. The results are from a survey conducted by media intelligence provider Gorkana on behalf of provider Gorkana on behalf of the US dental office in Treharris, the English foot- ball team was considered world class and the average house cost less than £4,000. Five decades later, she is still very active at the University Dental Hospital (UDH) in Cardiff, where she started her NHS career as a dental nurse in 1966.

After having completed her training as a dental nurse, for which she applied after reading an advert in the South Wales Echo newspaper, and working in that position for a year, she assumed the post of Senior Dental Nurse Tutor at UDH Cardiff, a position she still holds today. In addition to that, she worked as Dental Nurse Manager at the same hospital from 1996 to 1997.

During her long years of service, for her, the most important thing has remained the patients: “I still see people today who I treated years ago,” she commented. “I always try to address them by their names so that they know I remember who they are—it’s important to me.”

According to Hooper, she has never missed a single day owing to sickness during her 50 years of service. “It has been an absolute pleasure to work alongside Liz,” said Beverley Withers, interim Dental Nurse Manager at Cardiff and Vale University Health Board and one of Hooper’s trainees. “She is well known and respected in the dental world, devoting much of her working life to dental nursing and dental nurse training including the South Wales evening course, training thousands of dental nurses during 40 years.”

Referring to her nickname of “The Oracle”, Withers added: “She is the go-to person to find out anything which is dental related.”

“I’d like to say a big thank you to Liz for her commitment and dedication to dental nursing. It is a fantastic achievement to have completed nearly 50 years of service and to have never taken a day’s sick during this time, truly amazing,” said Hayley Dixon, Director of Operations for the Dental Clinical Board.

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Dental fillings may contribute to increased levels of mercury in the body

By DTI

ATHENS, USA: Although the potential adverse health effects of mercury have been the subject of debate for a long time, the extent to which dental fillings affect mercury levels in the body was still unclear. New research has now found that people with multiple dental fillings exhibited significantly elevated levels of mercury in their blood compared with people who did not have dental surface restorations.

The study, which analysed data from nearly 15,000 individuals, is the first to demonstrate a link between dental fillings and mercury exposure in a nationally representative population. The researchers found that patients with more than eight fillings had about 150 per cent more mercury in their blood than those with none.

They further analysed exposure by specific types of mercury and found a significant increase in methylmercury, the most toxic form of mercury, associated with dental fillings, suggesting that the human gut microbiota, a collection of microorganisms living in the intestines, may transform different types of mercury.

Mercury exposure from dental fillings is not a new concern, but previous studies were inconsistent and limited, according to Dr Xiaozhong Yu, co-author and Assistant Professor of Environmental Health Science at the University of Georgia’s College of Public Health.

“This study is trying to provide the most accurate levels of exposure, which will form the scientific basis to make future risk assessment,” Yu said.

In response to the study, the American Dental Association (ADA) issued a press statement at the end of September that clarified that the association’s position on dental amalgam remains unchanged.

“The mercury levels cited in the study did not exceed a level that according to the National Academy of Sciences would be known to cause adverse health effects. Thus no conclusions about the safety of dental amalgam should be drawn from this study. In addition, the study used data that included two different types of dental materials: composite, which does not contain mercury and dental amalgam, made from a combination of metals including silver, copper, tin and mercury. It is important to note that since the study does not differentiate between the two filling materials, the study’s findings may be prone to over interpretation,” the ADA stated.

The ADA and the US Food and Drug Administration consider dental amalgam fillings safe for adults. However, they advise against its use in pregnant women and children under the age of 6.

The study, titled “Associations of blood mercury, inorganic mercury, methyl mercury and bisphenol A with dental surface restorations in the US population, NHANES 2003–2004 and 2010–2012,” will be published in the December issue of the Ecotoxicology and Environmental Safety journal. It was conducted by researchers at the University of Georgia and the University of Washington.
New Philips Sonicare toothbrush encourages better brushing habits

By DTI

LONDON, UK: Dental professionals regularly encourage their patients to implement a thorough oral care routine on a daily basis. However, between dental check-ups, their advice often passes out of mind. In order to bridge this gap and to help people improve their oral health through personalised guidance, Philips has developed the new Sonicare FlexCare Platinum Connected. At a launch event held in London on 16 September, the company introduced its first connected electric toothbrush for adults featuring smart sensor technology and the new Philips Sonicare app to up oral health care experts and the media.

“At Philips, we are constantly looking to innovate and provide solutions using smart technology that seamlessly fit into people’s everyday lives,” said Jilja Roast, UK Marketing Manager at Philips. “Working closely with dental practitioners, we have developed the Philips Sonicare FlexCare Platinum Connected and Philips Sonicare app, to provide patients with personal guidance on their oral health routine to help them achieve and maintain a great clean between dental check-ups.”

Smart sensor technology enables real-time tracking

The connected toothbrush synchronises with the Philips Sonicare app via Bluetooth to track brushing habits in real-time. A number of sensors track and analyse the user’s brushing routine while a personalised 3-D mouth map highlights trouble spots in order to coach the patient on his or her brushing technique. Location sensors track where the user is brushing for too short a duration and a SmartTimer ensures that the user brushes for the recommended time in each segment of the mouth.

Moreover, sensors alert the user when he or she is applying too much pressure or scrubbing the teeth rather than guiding the brush. A personalised touch-up feature identifies missed spots during brushing and encourages the user to go back to clean these.

The smart sensors are integrated into the toothbrush’s handle, allowing for the use of different brush heads, including the new AdaptiveClean brush head, which provides up to four times more surface contact and enhanced flexibility. Furthermore, the Sonicare FlexCare Platinum Connected provides a new Deep Clean mode. According to the company, this mode helps remove up to ten times more plaque than a manual toothbrush can.

Personal guidance with the new Philips Sonicare app

The Philips Sonicare app was developed in collaboration with over 500 dentists and dental hygienists and provides various personalised features that reinforce users’ oral care routine and give useful tips to further improve oral health. It allows patients to set daily goals and track their progress over time. The app stores an ongoing history of brushing data, making it easy for users to review their performance and share their progress reports with their dental professional via e-mail and social media, the company said.

To help the patient comply with guidance from his or her dental practitioner, the app features focus areas, specific spots in the patient’s mouth identified by the dentist that need more attention owing to plaque build-up, gingival recession and other issues. These spots are highlighted in the patient’s personalised 3-D mouth map to remind him or her to take extra care of these areas between check-ups.

Moreover, the app includes a brush head performance monitor that notifies the user when it is time to replace the brush head based on actual brushing time and pressure. The user can then order replacement brush heads directly via the app.

Key opinion leaders discuss potential of connected technology

After introducing the new Sonicare FlexCare Platinum Connected to the press, representatives of Philips UK met with oral health care experts from all over the country, among them dental hygienist Juliette Reeves from London and Dr Ben Atkins, principal dentist and owner of Revive Dental Care in Manchester, to discuss the potential of the new connected technology.

“I was really pleased with the fact that we have an app which we can use to educate our patients in between visits,” commented Reeves. “I would recommend the product without hesitation. The fact that it is so personalised is a huge advantage, the fact that it gives immediate feedback to me, to patients in between appointments. We are not waiting for them to come back in the chair for me to say: ‘Okay, here is a trouble spot’.”

“I think dentists are very active in encouraging and advising their patients on how to brush their teeth correctly, but they need more tools to achieve an actual difference,” Atkins remarked.

“The Philips Sonicare FlexCare Platinum Connected could bring about the necessary behavioural change because, in a way, it gives me a tool to brush my patients’ teeth for them and to track their results,” he told Dental Tribune.

The device is currently available in the UK and the US at a recommended retail price of £230 and $400, respectively.

© Philips
With new owner, BDIA Dental Showcase looks forward to promising future

By DTI

LONDON, UK: Before even the first day of this year’s BDIA Dental Showcase came to a close, news broke that George Warman Publications, part of the Mark Allen Group, bought the rights to Britain’s most important dental event. The publisher of several UK dental publications, including Dental Update and The Dentist, will be running the exhibition from the next edition in Birmingham in 2017 onwards. According to the British Dental Industry Association (BDIA), which represents dental manufacturers and suppliers in the UK, the show will continue to be known as “BDIA Dental Showcase” for at least five years. The organisation also said it will be working very closely with the Mark Allen Group to provide the best possible event for exhibitors and visitors in the future.

“Dental Showcase will benefit greatly from this new arrangement, providing fresh initiatives to maintain the show’s position as the market leader,” commented BDIA President Mike Cunn. “Working in partnership with George Warman and the Mark Allen Group is the perfect solution. They run leading exhibitions and events across diverse sectors and I believe their experience and expertise will make BDIA Dental Showcase an event that will be the envy of most.”

This year’s edition, which took place from 6 to 8 October at the ExCel, saw plenty of new products and services for dental professionals on display. Among the many newcomers to London was Dental Tribune International (DTI), which exhibited its extensive portfolio of publications and events at Booth N76. Visitors were invited to pick up their latest copy of Dental Tribune UK, as well as inform themselves about other DTI titles, such as the specialist magazines for a variety of dental disciplines and the Journal of Oral Science and Rehabilitation, which was launched in 2015 with the aim of providing high-quality research and clinical papers in the fields of periodontology, implant dentistry, prostodontics and maxillofacial surgery. Information about DTI-organised events, such as the roots summit in Dubai, were also available.

“Dental Showcase will benefit greatly from this new arrangement, providing fresh initiatives to maintain the show’s position as the market leader…”

Plenty of innovations

After the recent launch of its latest Sonicare toothbrush, Philips unveiled another addition to its cloud-enabled health ecosystem of devices and tools, Equipped with Breathometer technology, the Sonicare Breathcare is a new device that is intended to help users measure, track and analyse their breath quality easily and reliably.

The small and compact device will be available from early 2017 and allow users to analyse a sample of their breath in under less than 30 seconds, company representatives told Dental Tribune. The results are displayed in real time and can be synchronised with the Philips Sonicare app for further feedback and analysis, such as breath quality patterns.

Also on display in London for the first time to a professional audience was the new Sonicare Flexcare Platinum Connected. The blue-tooth enabled toothbrush synchronises with the Philips Sonicare app to track brushing habits in real time. A number of sensors track and analyse the user’s brushing routine, while a personalised 3D mouth map highlights trouble spots in order to coach the user on his or her brushing technique. Location sensors track where the user is brushing for too short a duration and a SmartTimer ensures that the user brushes for the recommended time in each segment of the mouth. Moreover, sensors alert the user when he or she is applying too much pressure or scrubbing the teeth rather than guiding the brush. A personalised touch-up feature identifies missed spots during brushing and encourages the user to go back to clean these.

People who clean之间的their teeth with a water flosser now have a device that allows them to do so wherever they want. Launched by Waterpik at the BDIA Dental Showcase, the new Cordless Freedom Water Flosser has no power cord and comes with a waterproof case. Operated by batteries, the new device is extremely lightweight and portable, according to the company, and thus can be used for travel and by people who do not have shave sockets in their bathroom. Furthermore, it offers in-handle controls and two built-in pressure systems.

Since flossing with the Water Flosser has been shown to be more effective than interdental brushes at reducing gingival bleeding, the Cordless Freedom Water Flosser is suitable for patients undergoing orthodontic, periodontic or implant treatment, the company said. “Unlike string floss, the Waterpik Water Flosser has been clinically shown to remove plaque and reduce bleeding gums,” remarked Waterpik Director of Professional and Clinical Affairs Deborah M. Lyle on the results of several recent studies. “Water Flosser has also been shown to be up to three times as effective for removing plaque around braces and twice as effective for improving gum health around implants, compared to string floss.”

Henry Schein was extending its recently launched loyalty scheme at the Showcase. Aimed at dental professionals who direct more than 80 per cent of their consumables spend to the company, the new REWARDS Platinum will offer a number of additional benefits, including double points on all purchases, 10 per cent discount on contract cover and annual service, as well as a zero charge on small orders.
Customers who are eligible for the new scheme will be able to upgrade their status in the upcoming weeks, according to Henry Schein. The company introduced Rewards for the first time at the Dentistry Show in April. Since then, over 1,000 customers in the UK have enrolled in the scheme, representatives said in London. Available exclusively to dentists and dental technicians, the programme is open to Henry Schein and Software of Excellence customers in the UK. Once enrolled, members enjoy a number of benefits, including special previews and early bird discounts on upcoming Henry Schein and Software of Excellence events. For a limited period, members will also receive a £100 discount on Practice Analysis, a new programme that is part of the company’s Dental Business Solutions offering to help practices increase their business revenue.

Also announced at Dental Showcase were new partnerships for Henry Schein Laboratory, allowing it to now exclusively offer BruxZir Shaded Milling Blanks, BruxZir Shaded 16, and BruxZir Anterior from Glidewell Laboratories to UK dental laboratories. Another recent addition to the portfolio is Roland DG’s DWX-51D five-axis milling unit, which effortlessly produces precise dental prostheses, including copings, crowns, bridges, inlays, onlays and abutments.

In addition to many of the established market providers, the focus of our stand here is our new thermal disinfector, Tethys H10 Plus, which decontaminates, washes, thermally disinfects and dries instruments with hot air, all in a single process, automatically preparing them for subsequent packaging and sterilisation.

“With many exhibitors reporting excellent on-stand sales, visitor figures for this year’s Showcase have shown that the dental industry is in good health with practices and practitioners happy to apply many of the technological advances they have discovered at BDIA Dental Showcase 2016, the BDIA said.

Michael Cann, who is also Managing Director of Septodont, was delighted with the numbers of visitors that they have seen at this year’s show. “Our stand this year has focused on our new online CPD training that will allow practices to be compliant with the 2013 Sharps Legislation using our new needle-stick injury prevention devices, which has had a very good response from visitors,” he said.

Sonia Tracey, Vice President of the BDIA and Managing Director of W&H, commented, “The visitors we have seen at our stand this year have done their homework before coming to the show, which makes our work so much better as we can offer them more detailed information and products that are useful back in their practice. This has also allowed us to spend quality time with them to ensure they get all the information they need. We couldn’t have asked for better.”

Next year’s Dental Showcase will be held from 19 to 21 October. The premier dental business event for the UK market takes place at ExCel, London every two years. Every other year, the show moves to the NEC Birmingham. Each of the last two editions saw over 12,000 dental professionals from across the UK in attendance.
Pension scheme automatic enrolment
Obligations and duties for dental practices
By Amanda Maskery, UK

New legislation came into force in June 2012 that will eventually oblige all employers in the UK to automatically enrol certain workers in a pension scheme and make contributions towards it. The practical arrangements of this are not straightforward in all cases and the need for careful preparation should not be under-estimated.

The new duties are being implemented month by month over a five-and-half-year staging period that began on 1 October 2012. Larger employers have been obliged to start before smaller ones. Staging dates will depend on the number of workers in a PAYE scheme. In brief, employers with between 50 and 249 workers had staging dates that ran from 1 April 2014 to 1 April 2015 and those with fewer than 50 workers (which applies to most practice owners) have staging dates between 1 June 2015 and 1 April 2017. New businesses have staging dates at the end of the overall timetable, up to 1 February 2018.

As employers, practice owners should be thinking about how they are going to implement the changes to ensure they are fully compliant with the law when the requirements take effect for them. The new duties require employers to automatically enrol eligible jobholders in their own qualifying pension scheme or the National Employment Savings Trust, a government saving scheme. They further require employers to make contributions that will gradually increase over a period of six years, from 1 per cent to 3 per cent by 2019.

From the date employers become subject to the new duties, they will have to automatically enrol any eligible jobholders in an enrolment scheme, unless a jobholder is already an active member of a qualifying scheme at the practice. That may sound straightforward, but there is more to it. First, any existing pension arrangement has to be reviewed to ensure this meets the stipulated requirements. Not all current stakeholder schemes will. It is possible that current pension arrangements will have to be amended and an appropriate alternative scheme will have to be implemented.

There are three categories of jobholders under the new legislation: eligible jobholders, non-eligible jobholders and entitled workers. Eligible jobholders are enrolled automatically and those who have opted out need to be re-enrolled every three years. As employers, practice owners have to provide these employees with mandatory information about automatic enrolment and pay mandatory minimum contributions towards their pension.

Non-eligible jobholders are workers who do not fit the eligibility criteria for automatic enrolment and are defined as those earning over £10,000 per annum and aged between 16 and 21 or between state pension age and 74, or those earning between £5,772 and £10,000 per annum and aged between 16 and 74. While employers are not required to automatically enrol these workers, such employees can opt in to the scheme and, if they do so, employers may make minimum contributions on their behalf.
Entitled workers are those who earn less than £5,772 per annum and they are required to be provided with information about their right to join a non-contributory scheme. While they do not have to make contributions, employers must ensure that these workers have access to a pension scheme, even if not a qualified pension scheme, should they request one.

In order not to fall foul of the safeguarding duties, it is important that practice owners update their practices and keep mandatory information about all their pension scheme-related arrangements. Furthermore, they should regularly review those employees who are or may become eligible and, if necessary, alter contracts of employment and other relevant documents to ensure compliance and best practice.

“...it is important that practice owners update their practices and keep mandatory information about all their pension scheme-related arrangements.”

Breaching the new duties could result in compliance notices and penalties that would vary according to the size of a practice. Employers that do not comply could be liable for escalating penalties, ranging from between £50 for the smallest employers and up to £10,000 a day for the largest employers if failure to comply was wilful, it could amount to a criminal offence, liable on conviction to imprisonment or a fine or both.

Compliance with the new legislation is policed by the Pensions Regulator. Practice owners that have not made any arrangements yet should immediately check the staging date that applies to their practice or practices by looking at the staging date timeline on its website (www.thepensionsregulator.gov.uk). All practice owners are well advised to start taking steps well before their individual staging date to prepare, particularly so that they can manage the financial implications of the changes.
One of the main advantages of clear aligners is that with them we can control the vertical dimension. One of the worst things we can do in open-bite treatment is to allow the posterior teeth to extrude. With clear aligners, we do not only prevent the posterior teeth from extruding, but actually intrude them a little, when needed, allowing us to control the vertical dimension and close the anterior open bite at a much faster rate than with any other fixed appliance as a matter of fact. Thus, what I aim for is to intrude the posterior teeth when there is already an anterior open bite. With both an anterior and posterior open bite, we create a mandible that simply autorotates and that will help close the anterior open bite.

ClinCheck and digital scanning have advanced clear aligner treatment. What impact have they had on digital technology in the field? I have been using scanners for six years and have not taken one conventional impression since then. The first thing one notices when one starts using scanners is that aligners adapt so much better to the teeth because the scan is far more accurate. Second, it allows for an improved patient experience. Using polyvinyl siloxane material is always a hassle and a discomfort for the patient if the material gets into the mouth. Using scanners saves a great deal of time and is more comfortable for the patient.

Furthermore, with ClinCheck, which provides 3D treatment planning, I am able to plan different approaches and then decide for myself. If I am still not certain, I can show the patient what each treatment outcome will look like and then let him or her decide. This way, it becomes an educational tool that can enhance patient compliance.

Aligner treatment is not without its critics. Is there any justification for this, in your opinion? The aligner market has actually advanced quite a bit and this development is based on science, technology and experience. Aligners are custom made and that alone should be enough to elicit a positive response to aligners. What I personally like about this treatment modality is that the aligners do not apply a great deal of force, maybe 10, 20 or 30 grams. Research has shown that this is the optimal amount of force; strong forces are not actually needed. Also, the clinical achievement is really in the hands of the orthodontist. There is very little downside to this as far as I am concerned.

There are certain shortfalls. For example, patient compliance and sometimes teeth do not move as one intended, but that happens with fixed braces too.

What was obvious here in Brighton is that orthodontics is at a crossroads. What role will clear aligners play in the future, in your opinion? I believe—and I said that already five years ago—that in ten to 20 years, a much larger portion of our patients will be treated with aligners as opposed to fixed braces. Braces have allowed us to understand the bio-mechanics very well and aligners just take that same knowledge and apply it to invisible aligners.

The future role of clear aligners is also determined by patients asking for this treatment. Dentists not yet using aligners have had to learn this treatment modality and quickly. Thus, its role is definitely defined by a combination of technology improving quite nicely and patients requesting it as an aesthetic treatment modality, for example. I am sure that the not-so-distant future half of all treatments will be done with aligners.

Where would you personally like to see aligner treatment heading in the future? I think aligner suppliers need to provide auxiliaries as part of their systems too. At present, we obtain aligners from one company, but have to go elsewhere to obtain the elastics and mini-screws etc. In a few years, companies will hopefully offer a comprehensive package to allow dentists to plan much ahead of time.

Another area where clinicians could benefit is being able to use different materials for the start and the end of treatment—just like in conventional orthodontic treatment where we use NiTi at the start of treatment and stainless steel at the end. However, there is a great deal of improvement in this regard already.

You run two practices entirely focused on aligner treatment. What advice would you give a clinician who would like to switch to that business model? It is important to first acquire the necessary clinical skills and become really comfortable using aligners. Treatment with aligners is not necessarily difficult, but it is a bit different, so it is necessary to become acquainted with it. The way to attain confidence is to treat enough patients—my guess is 1,000 or so. Once the clinician has become comfortable working with aligners, he or she can start thinking about switching.

Thank you very much for the interview.

An interview with Dr Sam Daher, Canada

Vancouver orthodontist Dr Sam Daher is one of the world’s leading experts in clear aligner treatment. Having performed more than 4,000 treatments with Invisalign, he currently runs two practices entirely specialised in this treatment modality in addition to his other four clinics. At the recent British Orthodontic Conference (BOC) in Brighton in the UK, where he presented a paper on open-bite treatment with clear aligners, Dental Tribune had the opportunity to speak with him about the benefits of digital technology, the future of clear aligners in general and his business model.

Dental Tribune: Dr Daher, this is the first time you have spoken at the BOC. How was your presentation received?

Dr Sam Daher: I have never been to the BOC, but I have spoken in London many times before. I can recall my first talk to a UK audience a couple of years ago. Back then, the interest in Invisalign was not what it is today, perhaps owing to a lack of faith in the system. Today, far more experience has been gleaned and we have seen much better results with it, so there is generally more interest from specialists. The attendance of my lecture here in Brighton was much better than before. Also, the questions were more numerous.

Your presentation here in Brighton focused on open-bite treatment with clear aligners. Could you summarise some of your key points for our readers?

One of the main advantages of clear aligners is that with them we can control the vertical dimension. One of the worst things we can do in open-bite treatment is to allow the posterior teeth to extrude. With clear aligners, we do not only prevent the posterior teeth from extruding, but actually intrude them a little, when needed, allowing us to control the vertical dimension and close the anterior open bite at a much faster rate than with any other fixed appliance as a matter of fact. Thus, what I aim for is to intrude the posterior teeth when there is already an anterior open bite. With both an anterior and posterior open bite, we create a mandible that simply autorotates and that will help close the anterior open bite.

ClinCheck and digital scanning have advanced clear aligner treatment. What impact have they had on digital technology in the field? I have been using scanners for six years and have not taken one conventional impression since then. The first thing one notices when one starts using scanners is that aligners adapt so much better to the teeth because the scan is far more accurate. Second, it allows for an improved patient experience. Using polyvinyl siloxane material is always a hassle and a discomfort for the patient if the material gets into the mouth. Using scanners saves a great deal of time and is more comfortable for the patient.

Furthermore, with ClinCheck, which provides 3D treatment planning, I am able to plan different approaches and then decide for myself. If I am still not certain, I can show the patient what each treatment outcome will look like and then let him or her decide. This way, it becomes an educational tool that can enhance patient compliance.

Aligner treatment is not without its critics. Is there any justification for this, in your opinion? The aligner market has actually advanced quite a bit and this development is based on science, technology and experience. Aligners are custom made and that alone should be enough to elicit a positive response to aligners. What I personally like about this treatment modality is that the aligners do not apply a great deal of force, maybe 10, 20 or 30 grams. Research has shown that this is the optimal amount of force; strong forces are not actually needed. Also, the clinical achievement is really in the hands of the orthodontist. There is very little downside to this as far as I am concerned.

There are certain shortfalls. For example, patient compliance and sometimes teeth do not move as one intended, but that happens with fixed braces too.

What was obvious here in Brighton is that orthodontics is at a crossroads. What role will clear aligners play in the future, in your opinion? I believe—and I said that already five years ago—that in ten to 20 years, a much larger portion of our patients will be treated with aligners as opposed to fixed braces. Braces have allowed us to understand the bio-mechanics very well and aligners just take that same knowledge and apply it to invisible aligners.

The future role of clear aligners is also determined by patients asking for this treatment. Dentists not yet using aligners have had to learn this treatment modality and quickly. Thus, its role is definitely defined by a combination of technology improving quite nicely and patients requesting it as an aesthetic treatment modality, for example. I am sure that the not-so-distant future half of all treatments will be done with aligners.

Where would you personally like to see aligner treatment heading in the future? I think aligner suppliers need to provide auxiliaries as part of their systems too. At present, we obtain aligners from one company, but have to go elsewhere to obtain the elastics and mini-screws etc. In a few years, companies will hopefully offer a comprehensive package to allow dentists to plan much ahead of time.

Another area where clinicians could benefit is being able to use different materials for the start and the end of treatment—just like in conventional orthodontic treatment where we use NiTi at the start of treatment and stainless steel at the end. However, there is a great deal of improvement in this regard already.

You run two practices entirely focused on aligner treatment. What advice would you give a clinician who would like to switch to that business model? It is important to first acquire the necessary clinical skills and become really comfortable using aligners. Treatment with aligners is not necessarily difficult, but it is a bit different, so it is necessary to become acquainted with it. The way to attain confidence is to treat enough patients—my guess is 1,000 or so. Once the clinician has become comfortable working with aligners, he or she can start thinking about switching.

Thank you very much for the interview.
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Treatment of localised gingival recession
A clinical case utilising ZEISS EyeMag Pro F loupes with Feather Light LED
By Dr Matthew Garnett, UK

A 32-year-old female patient complaining of discomfort and pain from her mandibular anterior region was referred for a specialist periodontal opinion. She was experiencing sensitivity of the teeth, tenderness and intermittent gingival bleeding. She felt that there had been progressive deterioration over the last two years (Fig. 1).

The patient regularly saw her general dental practitioner, who was undertaking supportive care that included scaling, polishing and desensitisation with the use of fluoride varnishes. Having been given oral hygiene advice, she was using a soft-bristled manual toothbrush on a twice daily basis in order to maintain her plaque levels. Medically, she was a fit and healthy non-smoker, working as a primary school teacher. As far as she was aware, she did not have any parafunctional habits such as clenching or grinding her teeth. There was no history of previous orthodontic treatment.

Clinical examination using the ZEISS EyeMag Pro F loupes (Carl Zeiss) established that all permanent teeth were present, excluding her third molars, and she had a caries-free dentition. She showed a good level of oral hygiene, although there were some small plaque and calculus deposits present throughout the dentition. Assessment of the area of main concern found there was a reduced vestibular sulcus with a relatively broad mandibular labial frenal insertion. The superior insertion of the frenum was at the mucogingival junction of teeth #41 and #31. There were 3 mm of labial recession associated with tooth #41 and 4 mm associated with tooth #31. Both the mandibular central incisors were sensitive to cold air at the cervical aspects of the teeth, where calculus deposits were present.

Although there was no significant pathological pocketing, the gingiva in the region of teeth #41 and #31 was erythematous and swollen, this was tender and bled easily upon probing. The interdental papillae were intact, albeit the midline papilla particularly inflamed. There was very little in the way of attached keratinised tissue apical to the recessive defects.

A diagnosis of Class IIb Miller’s defects affecting teeth #41 and #31 was made, along with the associated marginal gingivitis. This had probably been exacerbated by a high mandibular labial frenal insertion and pre-existing labial bone deficiency (dehiscence or fenestration) as a result of the mild overcrowding. The condition may have been exacerbated by some occlusal overload and attrition (Figs. 4 & 5).

After the diagnosis, the patient was advised on additional preventative measures with appropriate toothbrushing techniques. She was subsequently reviewed after further simple scaling and polishing procedures. She then consented for mucogingival surgery to the mandibular anterior region. The proposed treatment was an internal frenotomy procedure utilising a tunnelling technique, to allow for an autogenous connective tissue graft and coronal advancement flap. Surface relieving incisions were to be avoided.

Surgical treatment
First, the creation of a partial-thickness supra-periosteal pouch
in the region of teeth #42 to #32 was achieved with the use of tunnelling instruments. There were partial papilla separation and internal frenotomy (Fig. 6). After this, an autogenous connective tissue graft was harvested from the left anterior lateral aspect of the palate. This was subsequently guided through the tunnel to rest over the exposed root surfaces of teeth #41 and #31. In addition to this, the graft would provide supplemental support for the overlying soft tissue in the region (Fig. 7). The gingival soft tissue lay passively over the connective tissue graft prior to suturing and wound closure (Fig. 8).

Coronal advancement of the overlying pouch/flap was achieved with a continuous suture technique. Tension-free closure of the wound was possible; however, specific caution was required particularly in the region of tooth #31 owing to the previous separated frenal insertions. Were there to be excessive coronal advancement of the pouch/flap, this could have led to potential wound breakdown due to increased tension in the region. The connective tissue graft was intentionally left exposed to allow for an increase in the zone of keratinised tissue after healing (Figs. 9 & 10).

At the two-year review, the patient reported no sensitivity or tenderness in the region and was delighted with the outcome. She was able to fully clean the teeth and excellent gingival health was observed (Fig. 11). At the review stage, there were no signs of inflammation, no bleeding on probing, and no swelling or oedema present. Although there was still minor recession (1 to 2 mm) present affecting teeth #41 and #31, it was not possible to achieve full root coverage owing to the general positioning of the teeth, the attritive wear present, and the limited support and width for the interdental papilla, especially in between teeth #41 and #31. The persistent mild recession was no cause of concern for the patient.

The thickness of the gingiva and the zone of attached keratinised tissue had been increased, in addition to the vestibular sulcus being deepened. All of these features enabled the patient to fully maintain the area. The crucial aspects for a successful outcome for the case were to ensure careful soft-tissue handling, good adaptation and stability of the connective tissue graft at the recipient site, and tension-free wound closure.

At three months post-treatment, the hard palate donor site was fully healed with no signs of scarring (Fig. 12).
Seven dental marketing mistakes …and how to avoid them

By Carolyn S. Dean, Australia

As a dental professional, you face unfamiliar challenges in running and marketing your practice. You are confronted with increased competition (both locally and abroad), an oversupply of dentists, ever-rising practice operating costs, and more marketing-savvy patients. On top of this, your potential patients are becoming more discerning about where they go for dental treatment, with many heading overseas.

In order to achieve practice success, it is essential to build long-term relationships with patients and prospects. Long-term patients are more likely to feel satisfied. It is they whom come the opportunity to refer others to you and who will continue to use your services in the future. Over my years working with hundreds of dentists as a marketing consultant, I have observed the common mistakes that prevent them from being able to market their practices successfully.

1. Not knowing your numbers and not tracking them

One of the most common mistakes that I see is that many dental practices just do not track their numbers. There is a saying that “if you fail to plan, you plan to fail.” It is critical that you track all of the metrics in your business, and your marketing spend is no exception. The significant numbers that you need to know and track are:

- average lifetime value of a patient
- marketing return on investment
- new patients
- patient loss

2. Not knowing your ideal patient

One of the cornerstones of any marketing campaign is knowing who your ideal patient is. Many practices make the mistake of not identifying this in their eagerness to go ahead with their marketing campaigns as soon as possible. You need to stop and think about whom your marketing will be directed to, what this group of patients wants, what problems they have, and what solutions they need. The key to implementing a strategic marketing plan is identifying your practice’s ideal patient or target patient profile. Once you know your market, you need to establish how best to communicate with them.

3. Wanting a silver bullet

Marketing your dental practice to attract the right kind of patients, keep them active and encourage them to refer you to their contacts, is not easy task. Many practices think (and hope) that there is a silver bullet to solve their marketing issues. This leaves them open to different approaches, but nearly all of these have been done in a haphazard way and in short bursts. I call this a “scatter-gun approach” to marketing. It does not work to try one approach for a month or it is very common for practices to have their branding and logo professionally designed and then decide to take it over, producing home-made brochures and other marketing collateral that use different colours, fonts and even versions of the logo. If you are not consistent, your attempts at establishing a brand will be ineffective.

“Many practices think (and hope) that there is a silver bullet to solve their marketing issues.”

There are just so many things to think about when it comes to successful dental marketing.

3. Wanting a silver bullet

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4. Taking a scatter-gun approach

I speak to many dentists who tell me that they have tried many different types of marketing and they have all failed and nothing has worked for them. When I dig deeper, I discover that they have tried many two in an inconsistent manner without tracking the results or refining the campaign. This will always end in failure. It has been shown that it can take between six and eleven repetitions for patients to see or hear a message before they act on it. Do you know how many ways and how many times you communicate with your patients?

5. Doing it all by yourself

You have to remember that patients are more savvy than ever before. They are constantly exposed to huge amounts of marketing and their expectations of what is and is not professional are continually increasing. The reality is that when you are competing against the corporates, you need to ensure that your marketing is up to scratch.

6. Procrastinating

There are just so many things for you to think about when it comes to your dental marketing. How can you fix your website that is not effective? Should you be engaging with your patients on social media and how to start? You know that you need to educate your patients on a regular basis, but what are the best ways to do this? You need reactive and referral campaigns, but you have no idea how to carry this out in a professional and consistent manner. It is not uncommon to be so confused and overwhelmed that you spend your time procrastinating and doing nothing.

7. Not getting the right advice

When you own or run a dental practice, in fact any kind of business, there is no shortage of marketing advice to follow. There is an overwhelming amount of advice out there. You may have had the experience of wasting time or money on poor advice. The problem is that many dentists are not getting the right dental marketing advice. They may listen to many different sources and form opinions based on advice from people who may not understand the business of dentistry.

8. Summary

There is no magic when it comes to marketing your practice successfully. Quite simply, it comes down to:

- picking the aspects of marketing you want to use, wisely and with due care and thought
- ensuring that, whatever marketing activities you decide to undertake, you perform to the best of your ability and budget
- being consistent
- tracking your results—setting your goals and reviewing or refining them on a regular basis
- getting good advice from trusted experts in the area of marketing you are undertaking

It takes time, but the effort that you put in will be rewarded by more patients, increased production, better relationships with your team and patients, and a sense of control when it comes to your marketing. It is time now for you to focus on your marketing. By marketing well, doing it consistently, and avoiding the scatter-gun approach, you can avoid making the common mistakes that many practices make.
Twisted files and adaptive motion technology
A winning combination for safe and predictable root canal shaping

By Dr Gary Glassman, Canada; Prof. Gianluca Gambbarini, Italy & Dr Sergio Rosler, Argentina

The ultimate goal of endodontic treatment is the prevention and/or treatment of apical periodontitis, such that there is complete healing and absence of infection while the overall long-term goal is the placement of a definitive, clinically successful restoration and preservation of the tooth. Successful endodontic treatment depends on a number of factors, including proper instrumentation, successful irrigation and decontamination of the root-canal system right to the apical terminus in addition to hard to reach areas such as isthmuses, and access and accessory canals.²

The challenge for successful endodontic treatment has always been the removal of vital and necrotic remnants of pulp tissue, debris generated during instrumentation, the smear layer, micro-organisms, and micro-toxins from the root-canal system.³ It has been accepted that even with the use of rotary instrumentation, the nick- el-titanium instruments currently available only act on the central body of the root canal, resulting in a reliance on irrigation to clean beyond what may be achieved by these instruments.⁴ Shaping canals creates sufficient space to hold an effective reservoir of irrigant that, upon activation, can penetrate, circulate and digest tissue from the uninstrumentable portions of the root-canal system.¹,⁵

Several challenges often arise during root canal preparation. Some of the most common ones are anatomic factors that may prevent negotiation to the apical terminus, as well as ledge formation, perforation and file separation. The introduction of Nickel-Titanium (NiTi) alloy in endodontics presented a significant improvement, allowing good results in terms of cleaning and shaping of root canals, while reducing operating time and minimising iatrogenic errors.⁶,⁷

Thanks to the superior mechanical properties of the NiTi alloy, it was possible to use endodontic instruments of greater tapers in continuous rotation, increasing the effectiveness and rapidity of the cutting. However, several studies reported a significant risk of intracanal separation of NiTi rotary instruments.⁸,⁹ In fact, file separation via torsional and cyclic fatigue has created the biggest fear and risk for dentists using rotary NiTi files for root canal treatment.¹⁰

Although multiple factors contribute to file separation, cyclic fatigue has been shown as one of the leading causes.¹¹ Fatigue failure usually occurs by the formation of microcracks at the surface of the file that starts from surface irregularities caused by the grinding process during the manufacturing process. Due to the manufacturing technology that changes the crystalline structure completely so the triangular cross section NiTi file blank can be twisted while maintaining the natural grain structure. More precisely, TF instruments are created by taking a raw NiTi wire in the austenitic-crystalline structure phase and transforming it into a different phase of crystalline structure (R-phase) by a process of heating and cooling. In the R-phase, NiTi cannot be ground but it can be twisted. Once twisted, the file is heated and cooled again to maintain its new shape and convert it back into the austenitic crystalline structure, which is super elastic once stressed. The manufacturing process aims at respecting the grain structure for maximum strength as grinding creates micro-crack points during the manufacturing of the instruments.

Because TF files are twisted and not ground, no surface microcracks occur on their surface and therefore do not need to be polished away; thereby not dulling the cutting edges and retaining their efficient cutting ability.¹²,¹³

Because of the increased flexibility, the TFs maintain the original canal shape better, minimises canal transportation and stays centred even in severely curved root canals.¹⁴ In addition to the development of heat treated TF technology to improve the performance and safety of NiTi instruments, the file design has also been changed with respect file-dimensions, tip configuration, cross-section and flute design. More recently, a third factor has become important in this search for stronger and better instruments: Movement Kinetikas, the branch of motion in which the objects move.¹⁵

This reduction of instrumentation stress (both torsional and bending stress) is the main advantage of reciprocating movements. It has been shown that a lot of different reciprocating movements can be used, each one affecting the performance and the safety of the NiTi instruments. Therefore, when discussing the advantages and disadvantages of reciprocation, the exact motion should also be mentioned, since the actual angle of reciprocation can have substantial influence on both the clinical and experimental behaviour of NiTi instruments.¹⁶

Another possible advantage of reciprocation could be better maintenance of original canal trajectory, mainly related to lower instrumentation stress and consequently its elastic return. However, it must be underlined that reciprocation does not affect the inherent rigidity of the instruments. If a quite rigid NiTi instrument when discussing the advantages and disadvantages of reciprocation is slightly forced into a curved canal, it will create more canal transportation than a more flexible one, due to its inherent tendency to straighten. Moreover, tip design could strongly influence canal transportation.
with a cutting tip being more dangerous that a non-cutting pilot tip.

While reciprocation with NiTi instruments have become very popular recently, with a significant number of published articles, some of these studies have shown that there are significant disadvantages in the reciprocating movements. It is well known that a small inadvertent extrusion of debris irrigation into the periapical tissues is a frequent complication during the cleaning and shaping procedures, both with manual stainless steel and nickel-titanium rotary instrumentation. However, recent studies have shown that commercially available reciprocating instrumentation techniques seem to significantly increase the amount of debris extruded beyond the apex and, consequently, the risk of postoperative pain. A clinical study comparing Reciproc and NiTi rotary instruments has also confirmed these findings. Since reciprocation movement is formed by a wider cutting angle and a smaller releasing angle, while rotat- ing in the releasing angle, the flutes will not remove debris but push it apically. The SM 1 file and WaveOne motions are very similar, (even if not precisely diagnosed by manufacturers) which could also explain the higher incidence and intensity of postoperative pain that has been found in recent research studies.19, 20

Moreover, both WaveOne and Reciproc techniques use a rigid body, single file of increased taper (usually 02 taper, size 25) which is directed to reach the apex. In many cases, in order to reach the apical working length, reciprocating instruments are used with apically directed pressure, which produces an effective piston to propel debris against a patent apical foramen, and possibly directing debris laterally, causing canal debride- ment more difficult. Since instru- ments are commonly used without first performing preliminary coronal enlargement, this will result in a greater engagement of the file flutes and consequently more Promoting intracanal pressure, and thus application of pressure on the file. More- over, the cutting ability of a reciproc- ating file is decreased when compared to continuous rotation. Debris removal is also less, thus in- creasing the frictional stress and torque demand on the file, due to entrapment of debris within the flutes. To overcome this trend, some authors have advocated the use of NiTi rotary glide path instru- ments, before using a Wave- One or Reciproc instrument, but in this case the overall technique is no longer a single file technique but a more complex and more costly technique which utilises two different types of NiTi instru- ments, glide path instruments and shapers.4, 21

TF Adaptive

The TF Adaptive technique has been proposed in order to maximise the advantages of re- ciprocation, while minimising its disadvantages. By using a unique, patented motion, the innovative TF Adaptive Motion technology, together with an original three file technique, most clinical cases can be treated effectively and safely (Fig. 2).

TF Adaptive employs a paten- ted unique motion technology, which automatically adapts to in- strumentation stress, when used in the Elements Motor while in TF Adaptive setting. When the TF Adaptive instrument is not (or very lightly) stressed in the canal, the movement can be de- scribed as a continuous motion allowing better cutting efficiency and removal of debris. The cross-sectional and flue design are meant to perform at their best in a clockwise motion.

More precisely, it is an inter- rupted motion with the following CW-CCW angles: 600–0°. This in- terrupted motion is as effective as continuous rotation in lateral cut- ting, allowing optimal brushing or circumferential filing for better debris removal in apical canals. This interrupted motion also mini- mises iatrogenic errors by reduc- ing the tendency of ‘screwing in’ (aka pull down), that is commonly seen with NiTi instruments of large taper that are used in contin- uous rotation.

On the contrary, while negoti- ating the canal, due to increased instrumentation stress and metal fatigue, the motion of the TF Adap- tive instrument changes into a re- ciprocation mode, with specifically designed CW and CCW angles that may vary from 600–0° to 370–50° (Fig. 4). These angles are not con-
Coronal access and glide path
1. Place rubber dam.
2. Obtain straight line coronal access with slightly diverging axial walls adhering to the concept of Minimally Invasive Endodontics.
3. Achieve apical patency and establish an apical glide path using a #15 hand file, follow that with a #10 hand file and continue at least with a #15 hand file. Glide path may be facilitated with the M4 Safety Handpiece (Kerr Endodontics, Orange, CA) (Fig. 7). The pulp chamber should be filled helpful with NaOCl (Sodium Hypochlorite).

Canal size and file sequence determination (Figs. 5 & 8)

Small Canals (SM)
Using tactile feel, if you struggle to get a #15 K-File to working length (WL) then the canal size is deemed to be ‘small’. Use the Small Pack (one colour band) and its instrument sequence. The small sequence may also be used in severely curved canals as well as roots that may be very thin and the risk of strip perforation is a possibility.

Medium/Large Canals (ML)
Using tactile feel, if a #15 K-File feels loose at working length then the canal size is deemed to be medium/large. Use the Medium/Large Pack (two colour bands) and its instrument sequence.

Establish working length
Working length should be established with a reliable apex locator. A radiograph may help the clinician as well.

Irrigate and dry
When irrigating with EndoVac (apical negative pressure irrigation system), in small canals, you must take SM1 to working length. In medium/large canals, you must take at least ML2 to working length. Note that the Microcanula is 32mm in diameter (Fig. 9). TF Adaptive matching Paper Points may be used to dry the canals.

Obturation
TF Adaptive matching Gutta Percha in combination with the Elements Free Cordless Obturation system may be used to obturate the root canal system. Alternatively TF Adaptive carriers may be used.

Conclusions
TF Adaptive technology is based on a patented, smart algorithm designed to work with the TF Adaptive file system. The authors have also found that Adaptive Motion Technology works well with other ground file rotary systems making their use safer especially in smaller and curved canals. This technology allows the TF Adaptive file to adjust to intra-canal torsional forces depending on the amount of pressure placed on the file. This means the file is in either a rotary or reciprocation motion depending on the situation and adjusts appropriately.

This winning combination results in exceptional debris removal with the tried and trusted classic rotary Twisted File design and less chance of file pull down and debris extrusion with Adaptive Motion Technology.

Editorial Note: A complete list of references is available from the publisher. This article originally appeared in Oral Health dental journal May 2016.

Disclaimer: Drs. Gambarini and Glassman are the inventors of Adaptive Motion and receive a nominal royalty from Kerr.
A 47-year-old female patient presented to our clinic with a radiograph that showed an extensive iatrogenic perforation of the furcation area at tooth #36 (Figs. 1 & 2) that was associated with radiographic bone loss, a vestibular fistula and pain on palpation. The patient had previously received urgent intervention concerning this tooth by another clinician owing to acute pain from pulpititis. The case was subsequently recommended for endodontic therapy.

After an initial discussion with the patient, anaesthetic was administered and the tooth was isolated. After creating a coronal access, we clinically verified the presence of pulp necrosis and perforation. The root canal was disinfected (crown-down) with an irrigation agent (5% NaOCl) and ultrasonic activation using straight tips (Irissonic, Helse). The working length was then determined with the help of a foramen locator. The final preparation of the canal was performed with the RECIPROC system (VDW).

The prepared area was cleaned and refined with an ultrasonic diamond tip (PyD, Helse). In addition to the intra-canal disinfection process, calcium hydroxide (Ultradent) placed in the furcation area was exchanged every two weeks, during which time the symptoms were alleviated.

The obturation was performed according to the thermomechanical Tagger hybrid technique (Fig. 3) using the Gutta-Condensor (Maillefer), TP gutta-percha cones (DENTSPLY) and the MTA-based sealer MTA-Fillapex (Angelus). After the thermomechanical compaction, the gutta-percha was cut and vertical condensation was performed using a cold plugger. The area of the perforation was then cleaned and refilled with calcium hydroxide.

After 15 days, we began to seal the prepared area and initially verified that the area had dried properly. The prepared area was filled with MTA Repair HP according to the manufacturer’s instructions, applied with the MTA Applicator (both Angelus). Clinical and radiographic criteria were used to determine correct filling with the material (Figs. 4 & 5), and a glass ionomer cement (3M) was applied to seal and protect the area (Fig. 6).

After temporary restoration, we observed the tooth radiographically and found proper sealing of the furcation area with MTA Repair HP. No postoperative complications were reported.

At the two-month follow-up visit, bone formation in the furcation area was detected. No further symptoms were reported (Fig. 7).

Dr Fábio Duarte da Costa Aznar is a specialist in endodontics at the Hospital for Rehabilitation of Craniofacial Anomalies at the University of São Paulo in São Paulo, Brazil. He can be contacted at fabio@aznar.com.br.
Roots Summit 2016
Premier global forum for endodontics takes place in Dubai

By DTI

DUBAI, UAE: This year’s ROOTS SUMMIT, which has drawn dental professionals to various locations all over the world in the past decade, will take place from Nov. 30 to Dec. 3 at the Crowne Plaza Dubai hotel in the United Arab Emirates. Aimed at updating participants about the latest in endodontic treatment, an unparalleled series of lectures and workshops will be held by global opinion leaders in the field.

Although the meeting will focus exclusively on the latest techniques and technologies in endodontics, the organizers have strongly encouraged not only dentists specializing in the field to attend but all who have an interest in endodontics, including general dentists and manufacturers and suppliers of endodontic products. Overall, about 700 attendees are expected.

Over the past 15 years, the ROOTS SUMMIT has grown significantly. The community originally started as a mailing list of a large group of endodontic enthusiasts in the 1990s. After the establishment of a dedicated Facebook group three years ago, membership increased from 1,000 to more than 20,000. Today, the group is composed of members from over 100 countries.

Previous ROOTS SUMMITS have been held in Canada, the US, Mexico, Spain, the Netherlands, Brazil and last year in India. These meetings have been known for the strength of their scientific programs and their relevancy to clinical practice. The lectures, workshops and hands-on courses scheduled for this year’s meeting will be no exception. More than 15 distinguished experts are presenting during the conference.

For the summit in Dubai, the organizers have partnered with Dental Tribune International (DTI) and the Dubai-based Centre for Advanced Professional Practices (CAPP) for the first time. With its international network, composed of the leading publishers in dentistry, DTI reaches more than 650,000 dental professionals in 90 countries through its print, online and educational channels, as well as a number of special events.

Over the past decade, CAPP has been able to establish first-class standards for continuing dental education programs not only in the UAE but also across the Middle East. Since 2012, CAPP has been affiliated with DTI as a strong local partner in the Middle East.

Based on the successes of previous ROOTS SUMMITs, the organizers anticipate a large turnout for this year’s meeting. Various sponsorship opportunities are available, including booth space, as well as sponsorships of workshops, hands-on courses, meeting bags and social events.

Online registration for the ROOTS SUMMIT is now open at www.roots-summit.com. Dental professionals are also invited to join the ROOTS Facebook group and like the ROOTS SUMMIT 2016 Facebook page.

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Irrigation dynamics in root canal therapy

By Anil Kishen, Canada

Irrigation dynamics deals with the pattern of irrigant flow, penetration, exchange and the forces produced within the root canal space. Current modes of endodontic irrigation include the traditional syringe needle irrigation or physical methods, such as apical negative-pressure irrigation or sonic/ultrasonically assisted irrigation. Since the nature of irrigation influences the flow of irrigant up to the working length (WL) and interaction of irrigant with the canal wall, it is mandatory to understand the irrigation dynamics associated with various irrigation techniques.

Endodontic irrigants are liquid antimicrobials used to disinfect microbial biofilms within the root canal. The process of delivery of endodontic irrigants within the root canal is called irrigation. The overall objectives of root canal irrigation are to inactivate bacterial biofilms, inactivate endotoxins, and dissolve tissue remnants and the smear layer (chemical effects) in the root canals, as well as to allow the flow of irrigant entirely through the root canal system, in order to detach the biofilm structures and loosen and flush out the debris from the root canals (physical effects). While the chemical effectiveness will be influenced by the concentration of the antimicrobial and the duration of action, the physical effectiveness will depend upon the ability of irrigation to generate optimum streaming forces within the entire root canal system.

The final efficiency of endodontic disinfection will depend upon both chemical and physical effectiveness. It is important to realise that even the most powerful irrigant will be of no use if it cannot penetrate the apical portion of the root canal, interact with the root canal wall and exchange frequently within the root canal system.

Syringe irrigation

Irrigation methods are categorised as positive-pressure or negative-pressure, according to the mode of delivery employed. In positive-pressure techniques, the pressure difference necessary for irrigant flow is created between a pressurised container (e.g. a syringe) and the root canal. In negative-pressure techniques, the irrigant is delivered passively near the canal orifice and a suction tip (negative-pressure) placed deep inside the root canal creates a pressure difference. The irrigant then flows from the orifice towards the apex, where it is evacuated. A detailed understanding of the irrigation dynamics associated with syringe-based irrigation would aid in improving its effectiveness in clinical practice.

Irrigant flow during syringe irrigation

The flow of irrigants is influenced by its physical characteristics, such as density and viscosity. These properties for the commonly used endodontic irrigants are very similar to those of distilled water. The surface tension of endodontic irrigants and its decrease by surfactants have also been studied extensively. The rationale of this combination is that it may significantly affect (a) the irrigant penetration into-dentinal tubules and accessory root canals and (b) the dissolution of pulp tissue. It is important to note that surface tension would only influence the interface between two immiscible fluids, and not between the irrigant and dentinal fluid. Experiments have confirmed that surfactants do not enhance the ability of sodium hypochlorite to dissolve pulp tissue or the ability of chelating agents to remove the smear layer.

The type of needle used has a significant effect on the flow pattern formed within the root canal, while parameters such as depth of needle insertion and size or taper of the prepared root canal have only a limited influence. Generally, the available needles can be classified as closed-ended and open-ended needles. In the case of open-ended needles (flat, bevelled, notched), the irrigant stream is very intense and extends apically along the root canal. Depending upon the root canal geometry and the depth of needle insertion, reverse flow of irrigant occurs near the canal wall towards the canal orifice.

In the case of closed-ended needles (side-vented), the stream of irrigant is formed near the apical side of the outlet and is directed apically. The irrigant tends...
to follow a curved route around the needle tip, towards the coronal orifice. The flow of irrigant apical to the exit of the needle is generally observed to be a passive fluid flowing zone (dead zone), while the flow of irrigant in the remaining aspect of the root canal is observed to be an active fluid flowing zone (active zone). Figs. 1a–d & 2a–d. A series of vortices of flowing irrigant are generated apical to the tip. The velocity of irrigant inside each vortex decreases towards the apex.

Large needles when used within the root canal hardly penetrate beyond the coronal half of the root canal. Currently, smaller-diameter needles (28-30 gauge) have been recommended for root canal irrigation.14–16 This is mainly because of their ability to advance further up to the WL. This facilitates better irrigant exchange and debridement.17–20 In addition, the use of a larger needle would result in decreased space being available for the reverse flow of irrigant between the needle and the canal wall. This scenario has been associated with (a) an increased apical pressure for open-ended needles and (b) decreased irrigant refreshment apical to the tip for closed-ended needles.16–20 The influence of tooth location (mandibular, maxillary) on irrigant flow has been observed to be minor.14–16

Irrigant refreshment

Irrigant exchange in the root canal system is a key prerequisite for achieving optimum chemical effect, because the chemical efficacy of the irrigants are known to be rapidly inactivated by dentine, tissue remnants or microbes.14–16 Investigations have explained the limitations in the irrigant refreshment apical to needles.14–16 Enlarging the root canal to place the needle to a few millimetres from the WL and ensuring adequate space around the needle for reverse flow of the irrigant towards the canal orifice allow effective irrigant refreshment coronal to the needle tip.14–16 Furthermore, increasing the irrigant delivered could help to improve refreshment in such cases.21–23

The effect of curvature on irrigant exchange has been studied indirectly by Nguy and Sedgley.24 They report that only severe curvatures in the order of 24–28° hamper the flow of irrigants. If the canal is enlarged to at least size 30 or 35 and a 30-gauge flexible needle placed near the WL is used, then irrigant refreshment can be expected even in severely curved canals.

Wall shear stress

The frictional stress that occurs between the flowing irrigant and the canal wall is termed ‘wall shear stress’. This force is of relevance in root canal irrigation because it tends to detach microbial biofilm from the root canal wall. Currently, there is no quantitative data on the minimum shear stress required for the removal of microbial biofilm from the wall canal wall. Yet, the nature of wall shear stresses produced within the root canals during irrigation provides an indication of the mechanical debridement efficacy.

In open-ended needles, an area of increased shear wall stresses develops apical to the needle tips, while in closed-ended needles, a higher maximum shear stress is generated near their tips, on the wall facing the needle outlet.24 Thus, in open-and closed-ended needles, optimum debridement is expected near the tip of the needle.24 Consequently, it is necessary to move the needle inside the root canal, so that the limited area of high wall shear stress involves as much of the root canal wall as possible. The maximum shear stress decreases with an increase in canal size or taper. Thus, overseas parent root canal enlargement above a certain size or taper could diminish the debridement efficacy of irrigation (Figs. 1a–d & 2a–d).

Enhancing irrigation dynamics using physical irrigation methods

Fluid dynamics studies on apical negative-pressure irrigation have demonstrated maximum apical penetration of the irrigant, without any irrigant extrusion. This finding highlights the ability of apical negative-pressure irrigation to be safely used at the WL, circumventing the issues of vapour lock effect.25 Nonetheless, the apical negative-pressure irrigation produced the lowest wall shear stress. This decrease in the wall shear stress could be attributed in part to the reduction in the flow rate with this irrigation system.

Passive ultrasonically assisted irrigation, when compared with other irrigation methods, showed the highest wall shear stress along the root canal wall, with the highest turbulence intensity travelling coronal from the ultrasonic tip position. The lateral movement of the irrigant displayed by this method has important implications with respect to its ability to permit better interaction between the irrigant and the root canal wall, and to potentially enhance the interaction of irrigants with intra-canal biofilms.16–19 (Figs. 1a–d & 2a–d).

Conclusion

The requirements of adequate irrigant penetration, irrigant exchange, mechanical effect and minimum risk of apical extrusion oppose each other and a subtle equilibrium is required during irrigation. Ideally, in a canal enlarged to size 30 or 35 and taper 0.04 or 0.06, an open-ended needle should be placed 2 or 3 mm short of the WL to ensure adequate irrigant exchange and high wall shear stress, while reducing the risk of extrusion.

In the case of a closed-ended needle, placement should be within 1 mm short of the WL so that optimum irrigant exchange can be ensured. The apical negative-pressure irrigation did not generate marked wall shear stress values, but allowed the flow of irrigant consistently up to the WL. It was the safest mode of irrigation when used close to the WL. The passive ultrasonically assisted irrigation generated the highest wall shear stress. The use of combined methods to obtain optimum disinfection and to circumvent the limitations of one method is recommended.

Editorial note: A list of references is available from the publisher.
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