Blood pressure and periodontitis

By DTI

GUANGZHOU, China: Treatment of periodontitis significantly lowered blood pressure among Chinese patients at risk of developing high blood pressure, according to a preliminary study. The research was presented at the American Heart Association’s Scientific Sessions 2017, a premier global exchange of the latest advances in cardiovascular science for researchers and clinicians.

The study compared blood pressure levels after standard and intensive treatment for periodontal disease among 107 Chinese women and men aged 18 years and over with prehypertension and moderate to severe periodontitis. Through random assignment, half of the participants received standard treatment and half received intensive treatment. One month after treatment, systolic blood pressure was nearly three points lower in participants receiving intensive treatment, but no significant difference was observed in diastolic blood pressure. Three months after treatment, systolic blood pressure was nearly eight points lower and diastolic blood pressure was nearly four points lower in the same patient group.

Six months after treatment, systolic blood pressure was nearly 15 points and diastolic blood pressure was nearly 10 points lower in these patients. “The present study demonstrates for the first time that intensive periodontal intervention alone can reduce blood pressure levels, inhibit inflammation and improve endothelial function,” said study lead author Dr Jun Tao from the University in Guangzhou.

Five million patients

Align Technology has announced that its five millionth Invisalign patient has begun treatment. “It’s very rewarding to see how rapidly it’s happened and to know that we are helping to transform people’s lives,” said Joe Hogan, Align Technology President and CEO.

Anti-cariogenic herb

A research team from China and the Netherlands has found that extracts of the Chinese herb Gual chinesis demonstrated anti-cariogenic properties. The herb inhibited dental caries by favourably shifting the demineralisation/remineralisation balance of enamel and curbing the biomass and acid formation of dental biofilm.

In new research, intensive treatment of periodontitis was associated with a significant decrease in blood pressure among patients at risk of developing high blood pressure.

Dental benefits

After plans to terminate the Australian Child Dental Benefits Scheme (CDBS) in 2016, the government finally decided that it was to be saved and increased efforts to raise public awareness of the benefits programme. Apparently, this has paid off. According to new figures disclosed by Department of Health official Mark Cormack, 893,714 children had utilised the CDBS by September this year. According to Cormack, this is a higher number than the same time last year, although he did not provide actual September-to-September data for comparison of the 2016/2017 period. In total, 1,056,921 children out of about 2.9 million made use of the CDBS in 2016, the figures further showed. In 2018, the scheme, which allows low-income families to claim a rebate of up to A$51,000 per child every two years for dental care, will be continued with minor amendments.

Long waiting times

DARWIN, Australia: Unreasonably long waiting times in public dentistry have been an issue in Australia for some time. Now, new figures disclosed in a senate estimates hearing in Canberra in October show that the problem worsened in most states in 2016, especially in the Northern Territory. Here, the waiting period increased dramatically from 30.8 months to 45.7 months—almost four years—in just a year.

According to a report by the NT News, the national average waiting time in 2016 was 12.05 months, with Victoria having the second longest wait in the country with 16 months and Western Australia the shortest with 2.5 months. Compared with the previous year, the figures show deterioration of the situation in most states. Waiting times increased in Victoria (from 12.77 to 16.03), New South Wales (from 12.90 to 14.20), the Australian Capital Territory (from 5.36 to 5.95) and South Australia (from 12.45 to 14.70).
Malaysia: Dental Bill 2017 proposes stricter regulation

The council will have the power to approve or reject the registration applications of dental practitioners and specialists. The Dental Therapy Board will register and issue certificates to dental therapists and postgraduate dental therapists based on the conditions and restrictions of the new law and will be responsible for regulating the registration examinations and ethical and professional conduct of the professionals in the group.

The imminent revision of the regulatory framework comes as no surprise, as the country has seen a string of incidents related to fake dentistry practices and persons delivering dental services and treatments without valid licensing. In this regard, the Dental Bill 2017 aims to ensure the safety of dental patients and maintain high standards of dentistry in the country. The proposed law will also empower the council and the board to conduct disciplinary proceedings and impose punishment on their members who violate the conditions and terms that are set out in the bill, precipitously reported. According to the news website, the current legislation does not allow for disciplinary action to be taken against illegal dentists or unregistered practitioners who work in registered practices.

While the Malaysian Dental Association (MDA) has welcomed the first reading of the new bill, the association has also raised concerns that stricter regulations might cause unwanted limitations to the profession, the New Straits Times reported. Therefore, MDA President Dr Ng Wuan Yung stressed that any clause that limits the freedom of practice of dentistry by the general dentist will reduce the accessibility of many dental procedures by the general public, especially in the rural areas, resulting in monopolies driving up prices. This may cause less informed members of the public to resort to illegal dentistry that will ultimately endanger their health.

Changes in legislation

By DTI

KUALA LUMPUR, Malaysia: Malaysia’s new Dental Bill 2017, which had its first reading in Parliament on 27 November, will see significant changes made to the regulation of the dental profession and the organisational structure of the dental workforce. Among other measures, the bill aims to appoint the Malaysian Dental Council and the Malaysian Dental Therapist Board to control and regulate the profession. The existing dental council, established under the Dental Act of 1971, will consequently be dissolved.

Originally the intention was to only amend the Dental Act 1971, but due to the many amendments that were proposed, it was decided that it was necessary to table a new law altogether. The proposed bill allows for more effective regulation of dentistry, puts stricter disciplinary procedures in place for dental professionals and introduces fees and charges for registration and licensing.

Only accredited and registered dental surgeons, from both the public and private sector, who have been practicing as dental surgeons for at least seven years in Malaysia would represent the newly-proposed Dental Council.

First Dental Tribune Japan issue

By DTI

TOKYO, Japan: Almost 20,000 visitors celebrated the latest in dentistry in Tokyo in November. Held at Tokyo Big Sight, the city’s international exhibition centre, the Tokyo Dental Show featured more than 190 local and international manufacturers and dealers. Among the new products introduced to the Japanese market was the first issue of Dental Tribune Japan.

Together with Yoshimitsu Teraoka, representative of Dental Tribune International (DTI) in Japan, delegates from the company’s head office attended the trade show not only to meet clients, but also to introduce DTI’s new publishing partner in Japan, Medical Net DTI and the listed Tokyo-based company officially joined forces already in July. In October, the first issue of Dental Tribune Japan was launched, which reaches 20,000 dentists and 10,000 dental hygienists in Japan.

“Japan is the third-largest economic power in the world and there are many good dental companies in the country,” commented Medical Net President and Chief Operating Officer Yuji Hirakawa. “We want to be a bridge between Japan and the rest of the world.”

Astrid Saito, Division Director Dental Tribune Japan, and DTI Business Development Manager Claudia Salwiczek-Majonek said: “Our partners here in Japan have not only published an outstanding first edition of Dental Tribune Japan, but also perfectly reflect those of Dental Tribune International. Scan this code to subscribe our monthly Dental Tribune Japan e-newsletter.

Among the many other exhibiting companies that presented their products and services at the two-day event were Asahi Roents, Dental Pro, Osada, Planmeca, SHOFU, Sunstar, Tokai Belmont, Tokuyama Dental, Tokyo Giken and Yoshida Dental.

At the show, two trends in dentistry were obvious. One was the ongoing advancements in the digital field, with even more precise dental tools, such as intraoral scanners, milling machines and devices for a digital workflow, showcased at the industry exhibition. The second indicated a longer-term transformation of the profession. While prevention and preservation have conventionally been a part of dentistry, there is an increasing shift towards these two aspects becoming the foundation of dentistry—not least owing to population ageing, a phenomenon especially prevalent in Japan. This change from mainly providing treatment to implementing a more holistic approach to oral healthcare was evident at the Tokyo event.

First Dental Tribune Japan issue

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Almost all Myanmar mouth cancer patients chew betel quid, study finds

By DTI
TOUNGOO, Myanmar: A study has found that almost all of the mouth cancer patients investigated used smokeless tobacco in the form of betel quid, researchers have reported at the European Society for Medical Oncology Asia 2017 Congress, held in Singapore from 17 to 19 November.

This observational study investigated the lifestyle behaviours of head and neck cancer patients that may have contributed to their disease. The cross-sectional study was conducted in the medical oncology unit of Toungoo General Hospital in 2016. All head and neck squamous cell carcinoma (HNSCC) patients who came to the hospital for treatment were included in the study. Participants were asked about their habits regarding betel quid chewing, smoking and alcohol consumption. Of the 107 cancer patients who visited Toungoo hospital that year, 67 (22 per cent) had HNSCC and were included in the study. Of those, 41 were male and 26 were female. The mean age was 59.2 years (range: 36–81 years) for men and 58.7 years (range: 19–86 years) for women. The most common cancer site was the oral cavity (34.3 per cent), followed by the larynx (31.4 per cent), oropharynx (15.9 per cent), hypopharynx (11.9 per cent), nasopharynx (11.9 per cent), lip (4.5 per cent) and nose (3.3 per cent).

Regarding lifestyle habits of the entire study population, 20 patients (30 per cent) chewed betel only; 19 patients (28 per cent) chewed betel and smoked tobacco; 19 patients (28 per cent) chewed betel, smoked tobacco and consumed alcohol. Two patients smoked tobacco and drank alcohol, two smoked tobacco only, two had none of the risk factors, and information was unavailable for three patients. All oral cavity cancer patients were betel quid chewers. In addition, 48 per cent smoked tobacco and 44 per cent consumed alcohol. The majority (87 per cent) of mouth cancer patients said they held betel quid in the buccal cavity most of the time.

Lead author Dr Khin Khin Nwe, a medical oncologist at the Toungoo General Hospital, said: “Given the number of health issues associated with chewing betel quid, particularly oral cancer and precancerous conditions such as leukoplakia and oral submucous fibrosis, understanding ways to reduce betel quid chewing is of global public health importance. In the last decade, betel quid has been classified as a group 1 carcinogen by the International Agency for Research on Cancer.”

Almost all Myanmar mouth cancer patients chew betel quid, study finds

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Parrotfish tooth research may ring in new era of biomaterial development

By DTI

SINGAPORE/BERKELEY, USA: The achievements of science are evolving constantly. However, there are many natural wonders that humanity has not been able to mimic yet. Among these are parrotfish teeth, which are one of the strongest and most abrasion-resistant in the animal world.

"Parrotfish teeth are really good all-round biters of hard things, and few other teeth in nature are harder or stiffer," said lead author Dr Matthew Marcus from the Lawrence Berkeley National Laboratory in California. To feed, the investigated steephead parrotfish Chlorurus microrhinos bite off corals and assimilate the organic material within it. To do so, these fish have two sets of teeth: one for biting corals and a pharyngeal set for grinding and chewing the bitten-off material.

Aiming to find out what makes the fish’s teeth so resistant, the researchers first measured their mechanical properties in nanoindentation experiments. Afterwards, they performed chemical analysis with a variety of techniques, including scanning electron microscopy with energy-dispersive X-ray analysis and electron probe micro-analysis.

As reported by nanotechnology.org, the results showed that it is not the material of parrotfish teeth that is special, but the arrangement of the crystals of the teeth. Studying the structure, the researchers found that the enameloid nanocrystals co-orient and assemble into bundles interwoven like the warp and weft threads in fabric. The fibres gradually decrease in size from 5 μm at the back to 2 μm at the tip, and according to Marcus, it is this size decrease that makes the tooth structure so hard.

"The results also show that in nature, complex structures have evolved to carry out specialised extraordinary functions, like biting coral, using simple, unsophisticated materials," Marcus told nanotechnology.org.

"Main-made materials, in contrast, usually do the opposite—that is, we use high-tech materials with a very basic structure.

According to the researchers, the techniques used in the study could be employed to study human bone and teeth more thoroughly and help in the development of new biomimetic materials.

The study, titled "Parrotfish teeth. Stiff biomimetics whose microstructure makes them tough and abrasion-resistant to bite stony corals," was published online ahead of print on 20 October in the ACS Nano journal.

Dental radiographs can reveal vitamin D deficiency

By DTI

HAMILTON, Canada: Human teeth hold vital information about vitamin D deficiency, and Canadian anthropologists have now found that this serious but often hidden condition can be detected on a simple dental radiograph.

McMaster University researchers Prof. Megan Brickley, Lori D’Ortenzio and their colleagues had previously discovered that human teeth hold a detailed and permanent record of serious vitamin D deficiency. This appears as microscopic deformities in dentine and can be extremely valuable for understanding precisely when people, even those who lived centuries ago, were deprived of sunlight, necessary for the body’s production of vitamin D.

The record is preserved by enamel, which protects teeth from breaking down, unlike bones, which are subject to decay. The problem with looking for such deformities is that a tooth must be cut open to observe the patterns that form a lifetime’s vitamin D record, and the supply of post-mortem teeth available for study is limited.

To avoid wasting precious specimens, the researchers looked for a way to isolate teeth for further investigation. By using radiographs to study the readily observable shapes of the pulp horns, the researchers found a consistent, recognisable pattern that could prove helpful both to their studies of archaeological teeth, as well as to people who may not realise they are suffering from vitamin D deficiency.

The pulp shape in a healthy person’s tooth resembles an arch topped by two cat ears, but in a person who has had a severe deficiency of vitamin D’s asymmetrical and constricted, typically looking like the profile of a hardback chair.

D’Ortenzio and Brickley’s previous research had suggested such a recognisable pattern, and their examination of both historic and current teeth proved that radiographic images are consistent and reliable indicators of prior deficiency.

"It was a realureka! It wasn’t just that it looked different. It was different,” remembered Brickley, who holds the Canada Research Chair in Bioarchaeology of Human Disease. “I think it’s really important. It was a piece of work that aimed to look more at past individuals, but it has the potential to contribute to modern healthcare as well.”

Since the consequences of vitamin D deficiency can be severe—especially in terms of bone health—knowing who has had a deficiency can help identify people who may have ongoing issues to prevent worse damage, the researchers said. If regular dental radiographs show a problem, blood tests can confirm whether there is a current deficiency.

Knowing more about ongoing vitamin D deficiency can also help to determine what is the best balance between protecting people from harmful UV rays and making sure they get enough sun to maintain a healthy level of the vital nutrient.

The study, titled “The rachitic tooth: The use of radiographs as a screening technique,” was published online on 7 November in the International Journal of Paleopathology.
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“A truly open solution”

By DTI

At the Greater New York Dental Meeting (GANYMED), global dental imaging technology specialist 3DISC showcased its newly developed Heron IOS scanner. Dental Tribune had the opportunity to speak with Sigrid Smitt Goldman, CEO and Executive Chairman of the 3DISC group, about the company’s entry into the intraoral scanner market and what sets the device apart from competing products.

After a two-year development process, you showcased the market-ready Heron IOS in New York. What were priorities in the development of the scanner?

The Heron’s lightweight design and ability to update in real time make it an essential tool in the contemporary dental practice. In development, we focused on ergonomics for the dentist and comfort for the patient. Recognising that size and flexibility in scanning are essential, we developed a small, lightweight hand- and mouthpiece with a 360° rotating tip for maximum flexibility and comfort when scanning the upper and lower arches.

Were there any challenges you had to overcome in the development process?

During the development process, we took initial concepts to dentists early on in the design phase and were quite surprised to find that they had very different approaches to some basic things, like how they would pick the unit up. Some used a pen grip, others lifted it from the top. This feedback led to several changes to the shape of the unit and drove the design of the 360° rotating tip that allows the scanner to be comfortably held and used in every situation.

When will the device be available to customers and in which markets?

We open for sales in Europe and USA in the first quarter of 2018 and the first scanners will be in clinics early in the second quarter. Increasingly, dental manufacturers are introducing open solutions. Our QuantorClinic software is a combination of our own scan software and exocad’s DB software, with dentalshare as the primary laboratory sharing tool. It facilitates order management, scanning, validation, commenting and order submission to the laboratory.

“Increasingly, dental manufacturers are introducing open solutions.”

Our QuantorClinic software is a combination of our own scan software and exocad’s DB software, with dentalshare as the primary laboratory sharing tool. It facilitates order management, scanning, validation, commenting and order submission to the laboratory.

The Heron offers an all-in-one application accessible from one interface—a truly open solution with what we believe is one of the market’s best-optioned CAD integrations.

Have you already planned any updates, such as introducing a wireless Heron IOS version in the future?

Naturally, the development of the solution does not end with the upcoming launch. We primarily expect updates on the software side, such as improvements to the free QuantorClinic software license that comes with the scanner. This means that dentists that order the first-generation software now will automatically get the updates with their software at no extra charge.

Editorial note: The scanner will be available to customers in Asia soon, a company representative told Dental Tribune. Currently, 3DISC is in the process of obtaining market approval for Heron IOS in China and Japan.

“Our QuantorClinic software is a combination of our own scan software and exocad’s DB software, with dentalshare as the primary laboratory sharing tool.”

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By DTI

BEIJING, China: Held for the fourth time in 2017, this year’s edition of the World Dental Forum proved to be a great success for its organiser, dental prosthesis provider Modern Dental Group. Bringing together over 800 dental professionals from around the world in the Chinese capital city, the event increased the exposure of the country’s growing dental market by engaging local market players and dentistry experts.

Complemented by a small-scale exhibition, which was held alongside the congress programme, the two-day forum covered a broad range of topics in lectures delivered by a line-up of international speakers who mainly focused on industry developments in the fields of digital dentistry, implantology and aesthetic dentistry. The opening speeches were delivered by Prof. Thomas Flemming, Dean of Dentistry at the University of Hong Kong, and the President of the Chinese Stomatological Association Prof. Yu Guang Yan, and were followed by traditional Chinese dance performances.

Commenting on the event’s regional focus, Modern Dental Group CEO Godfrey Ngai said: “Founded in Hong Kong, and being one of the major global players who have strong presence in five continents, it is our obligation to contribute towards the Chinese market through education and introducing international standards.”

Under Ngai, the Hong Kong-based company has extended its services to mainland China, training thousands of dental technicians and driving the development of the dental laboratory industry in China. Therefore, as part of the World Dental Forum’s social programme, attendees had the chance to visit the Modern Dental Laboratory in Shenzhen, which employs over 4,000 technicians and is the largest state-of-the-art laboratory in the world.

According to Ngai, the company will continue to nurture the emerging Chinese market by delivering knowledge, technologies and skills to the country. “We are confident that in the near future, the Chinese market will grow and develop into one of the leading dental prosthetic markets in the world.”
Sophisticated solutions tailored for the Indian market

By DTI

BANGALORE, India: Kicking off a series of events to increase their brand awareness in India, cooperation partners Planmeca and W&H have hosted exclusive roadshows in six of the country’s metropoles. At the evening events that were specifically tailored to the demands of the Indian dental market, attendees had the opportunity to familiarise themselves with the two companies’ comprehensive product portfolios during interactive expert discussions and live demonstrations.

“Our aim was to maintain the direct contact with dentists, institutional heads as well as corporate hospital heads on site and to establish W&H India and Planmeca India as an important local partner for advanced dental solutions,” said Raghavan Radhakrishnan, General Manager of the companies’ joint office in Bangalore, which was officially opened in April.

Radhakrishnan announced that the roadshows were just the start of their broader action plan for the country’s dental market. Inviting dental experts from all over India to be introduced to the latest solutions offered by the two family-run businesses, the roadshows were held in Chandigarh, New Delhi, Mumbai, Pune, Cochin and Bangalore from 8 to 14 November. According to the organisers, approximately 60–70 dental professionals attended each event, including dental specialists, such as implantologists, prosthodontists, oral surgeons and radiologists.

During the product presentations, special focus was placed on W&H’s new implantology device Implantmed, an automatic handpiece maintenance device Assistina TWIN and the company’s Primea Advanced Air Turbine.

Planmeca highlighted its Planmeca Emerald intraoral scanner and the Planmeca PlanMill 40 S, a chairside CAD/CAM milling unit. After an introduction, attendees had the opportunity to experience and discuss the innovative functionalities of the products during hands-on demonstrations.

“The aim of our roadshows was not only to present our product innovations and our product know-how, but also to support active networking among the Indian experts. For our product success and brand awareness the personal contact to our customers and target groups is decisive,” Radhakrishnan stressed.

“With the current series of events we offered an optimal platform for a lively exchange of experiences and know-how [...].”

J. Morita to distribute TRIOS in Japan

By DTI

TOKYO, Japan: Starting in spring 2018, J. Morita will distribute Danish digital solutions provider 3Shape’s award-winning TRIOS 3 intraoral scanner as part of its line of dental products in Japan, the two companies announced in November.

“[...] we offered an optimal platform for a lively exchange of experiences and know-how [...]”

The TRIOS range has received numerous awards. In October, the device was given the 2017 Cellerant “Best of Class” Technology Award for the fifth consecutive year in recognition of its accuracy, scanning speed and ease of use.

Earlier this year, 3Shape introduced TRIOS 3 Wireless at the International Dental Show in Germany. This device is the latest model in the TRIOS portfolio and the only wireless digital impression solution on the market. The newest model links to a PC via a point-to-point wireless connection to eliminate the need for cables in the operatory.
“Advanced knowledge and a supporting community via the Internet”

An interview with Dr Mikko Nyman, developer of new dental consultation portal QAdental

By Benito Gründer, DTI

In November, QAdental won the Innovation Award at the Finnish Dental Congress and Exhibition in Helsinki. Developed by Dr Mikko Nyman and Teddy Grenman, Chief Dentist and Chief Engineer at NUOVO NORDIC Healthcare Services, respectively, the platform offers dental professionals the opportunity to e-consult with dental specialists, serves as a database for learning material and patient cases, and enables forum discussions.

Dental Tribune spoke with Nyman about this pioneering solution and the expertise it brings to remote areas and developing countries.

Congratulations on winning the award. How did this come about?

This has been quite a year. We piloted QAdental in Namibia this spring. It wasn’t easy to obtain permission from the local ministry of health and it wasn’t easy to get people excited about something totally new. We visited the country twice. However, we managed to conduct the pilot successfully.

Did you have a team to support you in the development process?

QAdental was developed by a team. Teddy Grenman and I were the main architects, but without the rest of the team—CEO Jarni Korpela, Chief Medical Officer Jarkko Saramäki and Project Coordinator Teemu Tanninen—we wouldn’t have been able to conduct the pilot successfully in Namibia. Steve Jobs’s famous quote applies to QAdental also. “Great things in business are never done by one person. They’re done by a team of people.”

Did you expect to win the award?

We knew that big Finnish players such as Planmeca and Hammaslinna would take part in the contest with their new great, innovative products, but we were quite sure that there were not many service providers who would be taking part, so we made the decision to participate in the contest. Certainly, we didn’t expect to win. We didn’t even have any marketing material ready. We built QAdental based on the [Eric Ries’s] lean start-up principles. Validated learning was and will be the base for our development process.

How do the features of QAdental help practitioners in particular?

In Finland and many other countries, specialist services are not available in remote areas. This means dental professionals located there are obliged to work beyond their scope. QAdental brings them advanced knowledge and a supporting community via the Internet. This way, clinicians can perform more challenging procedures more safely and discuss patient cases with their peers. The growing international database of questions and answers and learning material is available for all members. With the help of the advanced search function—or maybe artificial intelligence in the near future—clinicians may find answers to their questions from previous questions and answers.

What sets QAdental apart from other dental community platforms?

This kind of consultation or support service might be very significant in enhancing patient safety and healthcare quality. Our plan was to export Finnish or Western expertise to developing countries. One challenge was that these countries cannot afford to pay for Western dental specialist consultation. That’s why we wanted to develop a way to share the knowledge. The solution was quite obvious: we had to create a place where all consultants, answers and learning material are available for all members so that the learning experience wouldn’t be limited to one person.

During the pilot project, we learnt that there’s a need for specialist e-consultations also in Finland, especially in remote areas. In Finland, there’s no tele-consulting platform where information and learning experiences are shared with several practitioners at the same time, so QAdental serves as a kind of reverse innovation when it comes to Western countries. Compared with other dental forums, QAdental focuses solely on consultation and learning material. There’s always a dentist on duty taking care of maintenance, and to make sure that the appropriate QAdental professional answers to the corresponding consultations. The officer on duty is also the quality controller when it comes to official answers.

Will your product be globally available?

QAdental is open to all dental professionals globally and membership is free. Dentists can register at www.qadental.com.

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JADR annual meeting stands out with diverse and broad scientific programme

By DTI

TOKYO, Japan: On 18 and 19 November, the Japanese Association for Dental Research (JADR), the Japanese division of the International Association for Dental Research (IADR), concluded the 2017 edition of its annual meeting held at Showa University in Tokyo. This year’s event particularly stood out with a diverse and broad scientific programme, offering the 350 local and international participants a wide choice of topics, such as advances in stem cell research, aetiology of periodontitis and life science in space.

According to congress President Prof. Ryutaro Kamijo, Chairman of the Department of Biochemistry at the School of Dentistry at Showa University, novel and interdisciplinary communication is needed to fully understand the issues society is facing today in order to provide solutions that further advance dental research in the future. Therefore, the theme of this year’s meeting, “Forefront of dental science—Towards a global standard in medical science,” was chosen to further spur worldwide progress in dentistry.

The international speaker lineup included Prof. Angus William G. Walls from Scotland (IADR President), Dr Seong-Ho Choi from Korea (President of the Korean Division of the IADR), Dr Harry-Sam Selikowitz from Norway (FDI World Dental Federation) and Prof. Irma Thesleff from Finland (University of Helsinki). They held special lectures on topics such as geriatric dentistry, oral and non-communicable diseases, techniques for the regeneration of damaged periodontal tissue, and conserved signalling pathways in tooth development and regeneration.

Among the highlights of the programme were the lectures under the topic of “Life science in space—Biomedical research performed in the international space station”, which addressed vital issues faced by dental researchers throughout the world. Currently, several studies are underway that are investigating complex matters related to long-term biological gravitational effects, as well as bone loss and muscle atrophy—comparable to those found in the ageing population.

“I am confident that the participants were able to take home several new ideas that will help to enhance dental science research in Japan and throughout the world,” concluded Kamijo about the successful event.

The JADR promotes a wide variety of research related to dentistry and serves as a gateway to the global development of dental science in Japan, with JADR members providing primary contributions to progress in dentistry throughout the world. The meeting and its mission were widely supported by the Japanese industry. Among the 54 sponsors were companies such as publisher Dental Tribune International and its Japanese partner Medical Net, Nobel Biocare Japan, Straumann, Lion Dental Products and Asahi Kasei Pharma.

The 66th JADR meeting is scheduled for 17 to 18 November 2018 and will be held in Sapporo in Japan under the theme “Back to the tangible—the symbiosis of basic research and clinical dentistry”.

More information can be found www.kokuhoken.jp/jadr66/
By DTI

Owing to the rigid ankylosis anchoring of the implant in the bone, high forces act on the superstructure, and this can lead to chipping and fractures in the case of restorations made from conventional, brittle ceramics. Owing to its dual ceramic–polymer network structure, the VITA ENAMIC hybrid ceramic (VITA Zahnfabrik) has a comparatively high, dentine-like elasticity. This elasticity allows the material to absorb masticatory forces. In this interview, Dr Nadja Rohr from the University of Basel’s centre for dental medicine in Basel in Switzerland reports on her findings in fracture load tests of implant-supported crowns.

In an in vitro study, you examined the fracture load of crowns made of hybrid ceramic and conventional ceramic seated on one-piece ceramic implants. What process did you follow?

Standardised molar crowns made of hybrid ceramics and feldspathic ceramics were attached to zirconium dioxide implants (ceramic implant, ø 4.0 mm, VITA Zahnfabrik) using four different attachment composites. After being stored in water for 24 hours at 37°C, the crowns reached their breaking point. The luting materials used were also characterised according to their flexural strength, elastic modulus, tensile strength and pressure resistance.

What were the differences between restorations made of VITA ENAMIC hybrid ceramic and conventional ceramic in the fracture load tests?

With the use of hybrid ceramics, significantly higher fracture load values were achieved compared with feldspathic ceramics. In your test series, the crowns were bonded with self-adhesive and conventional composites. Did that affect the fracture load values determined?

High fracture load values for hybrid ceramics and feldspathic ceramics were achieved with luting composites that had high pressure resistance.

How relevant is the pressure resistance of a luting composite in daily clinical practice?

High pressure resistance luting composites can increase the stability of the overall system. In the molar area, there are maximum masticatory forces of up to about 1,000 N. Choosing the right luting composite can have a positive effect on the clinical success of hybrid and feldspathic ceramic restorations.

What should be considered when choosing the luting composite, and what should be taken into account during the integration process?

Dentists should choose a luting composite that meets the specific clinical requirements of the case. For attaching hybrid ceramic crowns to zirconium dioxide implants, this would be an adhesive luting composite with high pressure resistance. Furthermore, it is important for the conditioning to be performed according to the manufacturer’s instructions.

Fig. 1: Dr Nadja Rohr. — Fig. 2: The crowns were loaded until fracturing occurred. — Fig. 3: Measurement results for the fracture load of the crowns (ten test samples for each restoration and luting material) made of hybrid ceramic and feldspathic ceramic, which were attached with different luting composites. — Fig. 4: Correlation between the fracture load of the crowns and the pressure resistance of the luting composites. — Fig. 5: Attaching the crowns to the zirconium dioxide implants.
New materials for a classic indication

Cementation of all-ceramic restorations using Variolink Esthetic

By Drs Eduardo Mahn & Juan Pablo Sánchez, Chile

Zinc phosphate cements are seen as classic luting materials for the cementation of metal–ceramic crowns. Along with all-ceramic materials, glass ionomer cements (GICs) and resin-modified glass ionomer cements (RMGICs) were introduced. Generally, luting cements are expected to meet certain requirements; they should provide an optimum bond to the tooth structure and restorative material, must not be soluble in water, should be suitable for application in thin coatings and should offer long-term stability. This is in contrast to the properties of classic cements, which are water soluble and do not establish an adhesive bond to the enamel or dentine.

Problem 1: Opacity

The opacity of the luting material is a critical issue for all-ceramic crowns, as well as ceramic inlays and onlays. Almost any colour can theoretically be reproduced with ceramics by exploiting their natural translucent properties. Using an opaque luting material appears to be counter-productive in achieving this. Further critical issues are the limitations involved in the anterior region and the location of the cement line in the visible area for inlays and onlays. For instance, if a tooth is restored with a veneer, the basic shade of the tooth is maintained, only the enamel is replaced, usually by using a translucent ceramic that covers the natural dentine. In such a case, it is essential to use a translucent luting material to achieve a favourable result.

Problem 2: Adhesion

The comparatively low bond strength of conventional cements is also problematic. Classic preparations around the tooth create a high degree of friction.
and retention. However, the retention is significantly reduced with partial crowns, veneers or onlays. It is therefore advisable to use a luting material that is capable of providing a strong adhesive bond. Both problems led to the widespread use of luting composite materials. Perhaps their only disadvantage is the removal of excess material. These luting materials are hard and solid and not water soluble, and they have a high adhesive strength, making removal of excess difficult. Early luting composites were equipped with a self-cure mechanism. Users had to wait a few minutes until the composite was almost fully set before they could remove the excess material. This period was risky because of the moisture in the mouth. Blood or saliva could come into contact with the non-polymerised composite and cause damage.

**Dual-curing luting composites**

These issues led to the rise of dual-curing composites for the cementation of all-ceramic crowns. Dual-curing luting composites are usually delivered in double-push syringes with a mixing tip. During extrusion, the base and catalyst are automatically mixed. The material can be applied directly. The main advantage is that the curing process can be accelerated with light and excess material can easily be removed. At the same time, the self-cure mechanism ensures a reliable cure, even with relatively thick or opaque ceramic layers. Nonetheless, there are some situations in which excess material cannot be removed all that easily because the setting reaction takes place too quickly or the material does not cure down to the depth of the composite layer!

One second of light curing, the surface is set and excess can be broken off, but the material is still paste-like at the interface to the crown or tooth.

Excess can be polymerised en bloc and pulled off as a ring in one go with no uncured material left in contact with the tooth or crown. In addition, the luting composite does not contain amine, which is another advantage, since amine may be implicated in discoloration of the cement line over time.

**Clinical case**

A 45-year-old male patient presented to the practice with a restoration on tooth #46. The tooth had been endodontically treated and temporised with a filling (Fig. 1). The temporary was removed, the tooth built up with Tetric N-Ceram Bulk Fill (Ivoclar Vivadent) and then prepared for the crown restoration (Fig. 2). An impression was taken with a one-step, two-phase impression technique using a putty and light-body silicone. After scanning the model, the crown was designed in

“Almost any colour can theoretically be reproduced with ceramics by exploiting their natural translucent properties.”

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the software suite (inLab, Dentsply Sirona) and milled from an IPS e.max CAD lithium disilicate block (Ivoclar Vivadent; Figs. 3a & b). After the crystallisation firing, the crown was stained and glazed (Fig. 4). The next step was to etch and silanate the ceramic crown with the new glass-ceramic primer Monobond Etch & Prime (Ivoclar Vivadent). This primer combines a ceramic etching and silanating component in a single material and therefore eliminates the need for the ceramic to undergo hydrofluoric acid etching (Fig. 5). After the etching and silanating step, the crown was rinsed with water and dried. The isolated enamel was then etched (Fig. 6). The adhesive (Tetric N-Bond Universal) was applied and dispersed with a strong stream of air. The dual-curing version of the Variolink Esthetic luting composite was used for seating owing to the thickness of the crown and the low translucency of the ceramic material (Fig. 7). The luting composite was applied into the crown. The restoration was then seated (Fig. 8) and light-cured from each side for two seconds. Excess composite was easy to remove owing to the Ivocerin photoinitiator (Ivoclar Vivadent), which provides a fast and thorough cure with a minimum amount of energy (Fig. 9). For final polymerisation, the restoration was light-cured from each quarter for 20 seconds (Fig. 10). Figures 11 and 12a & b show the oral situation after placement of the crown. Although the cement line was located above the gingival margin, it was not visible owing to the favourable tone and opacity of the luting composite. Figures 12a & b show radiographic control images of the restoration: the radiopaque build-up material and cement can easily be distinguished from the tooth structure. This aspect is particularly important in situations where excess cement cannot be seen with the naked eye.

Conclusion

The cementation methods used in conjunction with all-ceramic materials have changed for single-crown restorations. Variolink Esthetic is a protagonist of the latest generation of luting composites. Excellent bond strength values, coupled with user-friendly handling characteristics and highly aesthetic properties, make this material an asset in day-to-day dental restorative care.

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Figs. 12a & b: Radiographic control images before and after the treatment.
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Ivoclar Vivadent hosts successful Competence in Esthetics symposium

**NEW YORK, USA:** The next step in artificial intelligence advancement within dentistry could be just around the corner. Awrel, the dental software solution provider for web, mobile and voice platforms, has recently unveiled their Awrel Partner Portal. According to the company, this new technology enables dental supply companies and laboratories to supply their customers with intelligent, voice-guided ordering services for implants, supplies and equipment.

The capabilities of the new technology reportedly enable companies to extend their order processing capabilities beyond the current paper-, web- and mobile-based methods to environments that deliver next-generation, conversational voice experiences. Additionally, companies will be able to customize label their offerings, define unique workflows and create company- and product-specific conversational exchanges.

"We're very pleased to be the first dental software provider to deliver voice-assisted, hands-free ordering," said Dr. Arnold Rosen, Awrel founder and CEO. "With this technology, dental care providers will see improved productivity and quality while suppliers and labs will accelerate their sales processes. This is a definite win-win.

"The system is designed so that the person placing the order can respond to product-specific prompts from a voice-powered agent or chat-bot. Each subsequent interaction follows an intelligent, protocol-based conversational flow. After the order is completed, it can be sent via message to the supplier or laboratory, or the system can be customized so that it can flow directly into an existing electronic ordering system.

"We soon realise that the tooth and some asymmetry may be present—especially in the case of smiles that appear natural or beautiful. "It's all about harmony and individuality and not about perfection in form and symmetry," explained Cofar. When the team members use their library of nature in the digital planning process, they blend the anterior and posterior teeth of different cases. In the process, the teeth are scaled in size but never distorted, because that would affect the optical result adversely.

Especially for Ivoclar Vivadent events and lectures, the company developed the IV Events app. During the Competence in Esthetics 2017 symposium, the app provided information about the presenters and speakers, and allowed users to rate them using the star system used on social media. The app also gave participants the opportunity to pose questions to the presenters, and questions of broad interest were discussed on stage. The discussions were moderated by Dr. Thomas Bernhart (scientific chairman of this year’s event) and Laurent Schenck (Senior Director of Global Communications and Strategy at Ivoclar Vivadent).

**US dental software provider first to deliver voice-assisted ordering**

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Stay CALM! Planmeca algorithm improves imaging quality

By DTI

HELSINKI, Finland: Patient movement is among the most significant challenges to CBCT imaging, producing artefacts that can compromise the quality of the image.

According to Finnish manufacturer Planmeca, an end-user solution to this problem was in the company's sights for some time and has now finally been addressed with Planmeca CALM.

The algorithm analyses and compensates for patients' movement, eliminating the need for re-takes and thus improving the quality of and the time needed for imaging in dentistry. Recounting the development process of CALM (Correction Algorithm for Latent Movement), Planmeca's D imaging specialist Mikko Lilja explained the mechanism of the solution. "In tomographic reconstruction, the assumption is that the measurements—in this case, the CT x-ray projection images—are geometrically consistent with one another, but when a patient moves, the data no longer adds up, which shows in the reconstruction."

To avoid these disruptions, Planmeca CALM restores the consistency of the X-ray measurements by tracking the movement of the patient. The algorithm works with all volume and voxel sizes and adds only between 10 and 60 seconds to the overall reconstruction time, the company stated. The function can be run either after the scan is complete or before exposure to ensure that the volumes are already corrected when they are accessed in the Planmeca Romexis software.

"In the past, dentists would send their unsatisfactory images to the manufacturer for reconstruction or just redo the entire scan, but with Planmeca CALM this is now a thing of the past. We are proud to be the first dental manufacturer to provide a solution for motion artefact correction to the end-user," Lilja said.

For dentists, the CALM feature is especially valuable when imaging restless or livelier patients, such as children, individuals with special needs or elderly patients. "Even in cases where you might not typically think there has been significant movement, Planmeca CALM can noticeably enhance the image and enable seeing more details," Lilja concluded.

Western Australia to change restrictive CBCT ownership regulations for dentists

By DTI

PERTH, Australia: CBCT imaging is changing the way dental practitioners can visualise the oral and maxillofacial complex, as well as teeth and the surrounding tissue. Despite being regarded as beneficial for practitioners and patients alike, owing to a restrictive licensing policy, the technology is only available to a minority of dental practitioners in Western Australia. However, this regulatory framework is set to change, according to the Australian Dental Industry Association (ADIA).

Although each state and territory takes a different regulatory approach to owning CBCT equipment, in terms of outcomes, there is broad alignment across all of them—with the exception of Western Australia.

"ADIA welcomes news that the Radiological Council of Western Australia looks set to remove the restrictions on CBCT ownership in that state," said ADIA CEO Troy Williams. "Owning and operating CBCT equipment in Western Australia is currently limited to dentists registered with the Australian Health Practitioners Regulation Agency (AHPRA) in the specialty of dentomaxillofacial radiology—a criterion that only very few dentists fulfill. In a senate committee hearing on 9 November, the ADIA CEO pointed out that, of the about 1,780 registered dentists in the state, almost none satisfy the requirement to own and operate CBCT equipment.

Once in force, the regulatory changes will allow AHPRA-registered dentists who have successfully completed a recognised CBCT course to be eligible for a licence to own and operate CBCT equipment. According to the ADIA release, the requisite courses are offered by the dental schools at the University of Queensland and the University of Adelaide and by a private provider.

"This outcome is entirely consistent with what ADIA has argued for over many years. It’s actually five years ago this month that ADIA met with the then Minister for Health to progress this reform and we’ve naturally discussed it in the past with the current Minister, Roger Cook," Williams commented.

It has not yet been announced when the new legislation will be put into force.
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Fixed and removable implant restorations: A solution for every arch

By Dr Paresh B. Patel, US

Introduction

When a patient presents with an edentulous arch or terminal dentition, implant treatment can be provided that improves not only form and function, but also quality of life. For patients desiring better masticatory capability, stability, aesthetics and comfort than a conventional denture can offer, both removable and fixed implant restorations are superior alternatives.

Although fixed implant-supported restorations offer the highest levels of stability, function and patient satisfaction, removable overdentures also offer a dramatic improvement over conventional complete dentures. Both treatment options effectively mitigate the bone resorption that occurs after the loss of teeth, helping to preserve the oral and facial structures and, by extension, the self-confidence of the fully edentulous patient.

Determining which solution is appropriate requires a careful evaluation of the individual patient’s circumstances and desires. Even when an implant overdenture is delivered, the prosthesis can eventually be converted to a fixed restoration. As evidenced by the case that follows, in which one arch is restored with an implant overdenture and the other with a Brux-Zir Full-Arch Implant Prosthesis, practitioners today have a great deal of clinical flexibility.

“Whatever prosthetic approach is adopted, immediate, life-changing relief can be provided to patients suffering from terminal dentition or an uncomfortable, poorly functioning conventional denture.”
Case presentation

A 47-year-old male presented with terminal dentition in both arches resulting from periodontal disease and severe caries (Figs. 12–14).

The patient had already lost many of his teeth, and the dentition that remained had been rendered unstable by his periodontal condition (Fig. 2). He had saved up enough money for a fixed implant restoration for his upper arch, for which he desired the most functional, lifelike prosthesis possible. While he could not afford such a restoration for both arches, he wanted a retentive appliance for his mandible, with the option of later upgrading to a fixed prosthesis.

The patient accepted a treatment plan in which his maxilla would be restored with a BruxZir Full-Arch Implant Prosthesis and his mandible with an Inclusive Locator Implant Overdenture. Fabricating his maxillary restoration from monolithic zirconia would ensure maximum long-term durability. This was important considering the relatively young age of the patient, who would not have to worry about his maxillary prosthesis succumbing to fractures, chips or stains. His mandibular appliance would be held in place by connecting to the implants via Locator attachments (Zest Dental Solutions), which are an economical means of improving prosthetic retention and stability. The overdenture caps that connect to the Locator attachments would be incorporated in the prosthesis chairside—though it should be noted that many clinicians elect to have the laboratory handle this step.

The surgical phase of treatment called for the extraction of the patient’s remaining teeth, followed by the immediate placement of eight dental implants. Cone beam computed tomography (CBCT) scans were taken to help determine the optimal placement of the implants within the available bone and away from the patient’s vital oral anatomy. Evaluation of the CBCT scan determined that there was sufficient height, width and quality of bone to place the implants in the appropriate locations and angulations via freehand surgery. Four 3.7 mm Inclusive Tapered Implants (Gladewell Direct) would be placed in each arch to support the fixed maxillary restoration and the removable mandibular prosthesis. At the surgical appointment, the patient’s remaining teeth were removed, and a flap was raised to visualise the socket sites and areas of implantation. Bone levelling was performed on the patient’s upper arch to elevate the patient’s smile transition line above the upper lip.

The maxillary osteotomies were positioned to facilitate an all-on-4 configuration, with the posterior implants tilted to maximise the anterior–posterior spread, avoid the sinuses and accommodate the patient’s bone limitations (Fig. 3). Osteotomies were created for the placement of four mandibular implants, as opposed to the minimum of two required for a Locator overdenture. This would enhance retention of the overdenture while affording the possibility of upgrading to a fixed restoration at a later time. After the creation of the osteotomies, the implants were placed (Figs. 4a & b).

Inclusive Multi-Unit Abutments (Gladewell Direct) were attached to the maxillary implants, correcting for the divergent angulation of the implants. This would both position the restorative platform in a manner that would situate the screw access holes of the eventual prosthesis toward the lingual aspect and allow for a molar–molar restoration (Fig. 5). Note that patients with terminal dentition presenting for treatment are commonly anxious about losing their teeth and the effect this will have...
During the try-in appointment, the provisional implant prosthesis was milled and seated on the master cast to verify proper fit, as well as the interocclusal relationship with the opposing implant overdenture. The maxillary and mandibular wax set-ups were tried in to evaluate fit, aesthetics, occlusion and function. The provisional implant prosthesis was seated over Locator attachments. The implant verification jig was attached to the implants so that a definitive prosthetic design was accurate before milling the final restoration from monolithic zirconia. The implant verification jig was attached to the implants so that a precise final impression could be taken. The custom tray provided by the laboratory was filled with PVS material and seated over the implant verification jig. As the PVS material set, the relative positions of the implants represented by the verification jig remained fixed, ensuring an extremely accurate final impression.

After final approval of the wax sets-ups, the restorative protocols for the two prostheses diverged, as the laboratory moved directly to the final implant overdenture from the approved wax set-up, while the process for the BruxZir Full-Arch Implant Prosthesis included an implant verification jig, custom final impression and provisional implant prostheses. These extra measures were taken to make absolutely certain that the definitive prosthetic design was accurate after milling the final restoration from monolithic zirconia. The implant verification jig was attached to the implants so that a precise final impression could be taken. The custom tray provided by the laboratory was filled with PVS material and seated over the implant verification jig. As the PVS material set, the relative positions of the implants represented by the verification jig remained fixed, ensuring an extremely accurate final impression.

The maxillary immediate denture was then modified and relined to seat over the implants during healing. This approach provided the patient with same-day temporary restorations, and he walked out of the office with properly functioning teeth for the first time in many years. The effect this had on the patient’s comfort, function and appearance was immediate and profound. The final radiograph taken after seating the temporary appliances confirmed excellent positioning of the implants (Fig. 8). The patient returned after 14 weeks of healing for stability of the implants and health of the soft tissue to be evaluated. Removal of the temporary appliances revealed excellent tissue health around the healing abutments of the mandible and multi-unit abutments of the maxilla.

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thesis by seating over the Locator attachments and keeping the appliance in place during function.

A new master cast of the maxilla was produced based on the custom open-tray final impression. The new master cast and final approved wax set-up were scanned. A virtual model was generated, upon which the fixed monolithic prosthesis was designed using CAD software (Figs. 19a & b). Because this digital model was based on the final impression with the verification jig, screw access holes were created in precise alignment with the positions of the maxillary implants. The resulting design was used to mill a provisional implant prosthesis from polymethyl methacrylate (PMMA, Figs. 20a & b). This appliance was tried in and worn for a trial period, thus ensuring an accurate prosthetic design.

The provisional implant prosthesis is an essential element of the restorative process, as significant adjustments cannot be made to the final restoration once it has been milled from BruxZir Solid Zirconia. At the following appointment, the inclusive Locator Implant Overdenture was seated and checked for proper fit, function and support from the soft tissue. The provisional implant prosthesis was then screwed into place, and its tooth positioning, function and aesthetics were verified (Figs. 21a & b). With both appliances in place, the interocclusal relationship was checked (Figs. 22a & b). Minor occlusal adjustments were made directly to the maxillary provisional implant prosthesis, as PMMA is easily modified. Slight alterations were also made to the mandibular implant overdenture. Block-out shims and the retentive overdenture caps were then seated over the Locator attachments (Figs. 23a & b). Quick Up self-curing acrylic was used to pick up the metal housings in the overdenture and fill in the minor voids between the denture caps and recess wells of the prosthesis. Note that, in many cases, the dentist elects to have the overdenture caps processed by the laboratory — Fig. 24. The black processing inserts were replaced with the appropriate retentive caps, which are colour-coded according to strength — Fig. 25. The block processing inserts were replaced with the appropriate retentive caps, which are colour-coded according to strength — Fig. 26. The patient with the final Locator overdenture and the maxillary provisional implant prosthesis in place — Fig. 27. The definitive maxillary restoration was milled from BruxZir Solid Zirconia, incorporating the slight adjustments that were made to the PMMA provisional appliance — Figs. 28a & b. The final BruxZir Full-Arch implant Prosthesis completed a dramatic oral reconstruction for a patient who presented with terminal dentition, restoring form, function and quality of life.

The final BruxZir Full-Arch Implant Prosthesis was digitally fabricated with precision (Fig. 27). As an exact reproduction of the test-driven provisional, the definitive prosthesis fitted perfectly and offered the aesthetics and function the patient had come to expect (Figs. 28a & b). The final restoration effectively addressed the unique circumstances of the case, providing the most durable, stable prosthesis possible for his maxilla and a mandibular restoration that greatly improved prosthetic retention and could be upgraded to a fixed prosthesis should the patient’s situation change.

Conclusion

Practitioners now have the clinical flexibility to offer patients a wide range of treatment options, from entry-level, economical restorations like the Inclusive Locator Implant Overdenture to the fixed, highly durable BruxZir Full-Arch Implant Prosthesis. There is a viable means of treating nearly all patients, whatever their oral health, needs and finances. Given the life-changing benefits of implant therapy and the straightforward restorative protocols of today, all patients should be offered this service to confront the challenges presented by complete edentulism.

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