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.

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. Three months after treatment, systolic blood pressure was nearly 9 points and diastolic blood pressure was nearly 8 points lower in the same patient group.

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 Schedule (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 higher than the same time last year, although the figures show deterioration of the situation in most states. Waiting times increased dramatically in Victoria (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 16.05), New South Wales (from 12.92 to 14.20), the Australian Capital Territory (from 5.36 to 5.95) and South Australia (from 12.45 to 14.70).

Five million patients

Align Technology has announced that its five millionth Invisalign patient has begun treatment. “It’s very rewarding to see how rapidly Invisalign treatment is growing around the world. I can’t believe our first ‘million’ took ten years to achieve, while our fifth ‘million’ only took one year,” 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 Galla chinensis 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.
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 Yoshimatsu Terakura, 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 print 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 Salia, 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 represented DTI at the Tokyo Dental Show. We are very proud to be partnering with Medical Net and have high expectations for the launch of our entire portfolio, including our www.dtstudyclub.com education platform, in this thriving and promising market.”

Among the many other exhibitors that presented their products and services at the two-day event were Asahi Roening, Dentsply Sirona, GC, Ivoclar Vivadent, KaVo Kerr Group, Kuraray Noritake Dental, Mokuda Dental, Morita, Nishika, NSK, Osada, Planmeca, SHOFU, Sunstar, Takara 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 ever-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—least not 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.

IMPRINT
GROUP EDITOR: Dental ZIMMERMANN
www.facebook.com/dental-tribune
Tel.: +44 161 223 1830
MANAGING EDITOR: Kristin HÜBNER
EDITOR: Torsten R. OEMUS
DEPUTY EDITOR: Matthias DIESSNER
HEAD OF DIT COMMUNICATION SERVICES: Antje KAHNT
TEAM ASSISTANT: Nicole BACHMANN
CLINICAL EDITORS: Magda WITKOWICZ
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CHIEF FINANCIAL OFFICER: Torsten R. OEMUS
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EXECUTIVE PRODUCER: Nora SOMMER
ADVERTISING DISPOSITION: Nora SOMMER
DESIGNS: Yvonne BACHMANN
Published by DT Asia Pacific Ltd.

dENTAL TRIBUNE INTERNATIONAL
116 West 23rd Street, Suite 500, New York, NY 10011, USA
Tel.: +1 212 224 7185
Fax: +1 212 224 7186
info@dental-tribune.com
www.dental-tribune.com

 Regional Offices:
DT ASIA PACIFIC LTD.:
535, Stillwater Drive 5
535, Stillwater Drive 5
Tel.: +61 2 9452 0071
Fax: +61 2 9452 0072
www.dental-tribune.co.uk

DENTAL TRIBUNE AMERICA, LLC:
120 West 14th Street, Suite 345, New York, NY 10011, USA
Tel.: +1 212 224 7185
Fax: +1 646 444 0390

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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 307 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 (15.4 per cent), oropharynx (11.9 per cent), nasopharynx (11.9 per cent), hypopharynx (10.4 per cent), lip (4.5 per cent) and nose (1.5 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 (89 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.”

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Parrotfish tooth research may ring in new era of biomaterial development

By DTI

SINGAPORE/BERKELEY, U.S.A.: 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. Investigating their structural makeup, a team of researchers has now determined the underlying properties that make the fish’s teeth strong enough to even bite stony corals.

“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 nanotechweb.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 nanotechweb.org. “Man-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 both 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. Identifying individuals who may have experienced vitamin D deficiency has significant potential for further understanding of the factors that may have compromised the health of people in the past. 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 is asymmetrical and constricted, typically looking like the profile of a hard-backed 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 real eureka! 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 (GNYDM), 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. 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?

Increasingly, dental manufacturers are introducing open solutions. Is Heron IOS compatible with solutions other than those of 3DISC too?

Yes, the scanner output is entirely open, providing both STL and PLY format, and expected to be compatible with most open dental CAD systems.

“The 360° rotating tip allows the scanner to be comfortably held and used in every situation.”

Sigrid Smitt Goldman, CEO and Executive Chairman of the 3DISC group, with the company’s Heron IOS scanner during the 2017 Greater New York Dental Meeting.

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 licence 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.
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 has 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

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

J. Morita to distribute TRIOS in Japan

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.

“TRIOS 3 is renown for its documented high accuracy and amazing speed. J. Morita’s expert sales teams and strong service network make them an excellent partner for Japanese doctors seeking a smooth entry into digital dentistry,” commented Hiroki Nishiya, 3Shape Country Manager for Japan, on the agreement.

Since its launch in 2011, 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.

Fig. 1: Fast and lightweight. Planmeca’s new intraoral scanner, the Planmeca Emerald was the focus of some of the product presentations.—Fig. 2: With a series of roadshows, W&H India and Planmeca India updated attendees on their latest product solutions.
“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 NUVO 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.

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 Jani Korpela, Chief Medical Officer Jarkko Saramäki and Project Coordinator Teemu Tanninen—we wouldn’t have been able to conduct the pilot successfully. Teddy and I were the main architects, but without the rest of the team, 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 Hammarvåline 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 consultations, answers and learning material are available for all members so that the learning experience wouldn’t be limited to one person.

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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?

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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—Toward a global standard in medical science”, was chosen to further spur worldwide progress in dentistry.

The international speaker line-up 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 Theleff 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/
A fracture load study on implant-supported crown restorations

An interview with Dr Nadja Rohr, Switzerland

By DTI

Owing to the rigid ankylosic 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.

What 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.

Editorial note: This interview was first published in Dental Barometer, Issue 7/2017.
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 translucency 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 at 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. After 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.

**One material, five shades**

Variolink Esthetic (Ivoclar Vivadent) is based on the value shade concept. The shades are classified according to the effect to be achieved with the cement. Five shades are available: Light+, Light, Neutral, Warm and Warm+. In this way, the shade spectrum ranges from an opaque white tone (Lights) to an opaque yellow-brownish shade (Warm+). In between lie shades such as a coconut water white and a neutral tone (very translucent) and a warm tone (comparable to A3). In addition, the luting composite is available in an LC (light-curing) and a DC (dual-curing) version. The LC version is designed for relatively thin restorations, such as inlays, onlays and veneers. The DC version is suitable for more extensive and opaque restorations. The luting composite is used in conjunction with the light-curing single-component Tetric N-Bond Universal (Ivoclar Vivadent).

**Clinical case**

A 45-year-old male patient presented to the practice with a restoration on tooth #6. 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...
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).

Figs. 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 13a & b show radiographic control images before and after the treatment.

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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Ivoclar Vivadent hosts successful Competence in Esthetics symposium

By DTI

VIENNA, Austria: Digitalisation has changed the dental industry and new technologies have entered dental practices and laboratories faster than predicted. Following the dynamics of this development, dental manufacturer Ivoclar Vivadent highlighted this topic at its Competence in Esthetics symposium recently held in the Austrian capital of Vienna.

For the third time, Ger- net Schuller, Senior Direc tor for Austria and Eastern Europe at Ivoclar Vivadent, and his team succeeded in drawing participants from all over the world to the symposium. More than 2,000 people from 36 countries registered for the event, which is traditionally hosted at the Austria Center Vienna conference venue. An additional 800 people joined as day visitors to attend the presentations of the 21 speakers.

In his opening speech, Ivoclar Vivadent CEO Robert Ganley explained why it is important for the company to focus on digitalisation, a megatrend that has been predicted by reputable futurologists and not only for dentistry.

Many speakers at the symposium were pioneers in terms of digitalisation and have used several generations of devices and technologies and shared their experiences via numerous clinical cases that they treated using either a fully or mixed digital approach.

What changed with the advent of CAD/CAM? What are the strengths and weaknesses of this technology? At the event, there was a general consensus that CAD/CAM is an intelligent tool rather than a solution in itself. That CAD/ CAM facilitates day-to-day work and makes it easier for dentists and dental technicians to overcome the barriers of time and space was proven by a number of presenters who work as a team across different countries, among them Dr Ste fan Koubi from France and dental technician Hilal Kuday from Turkey, as well as Dr Florin Cofar from Romania and dental technician Loran Stumpf from Ireland.

At the symposium, new state-of-the-art software was introduced that in the future will allow users to see different versions of their restoration in a virtual mirror and modify it with a swiping motion, like on a smartphone. A demo version of the program is already available and was shown at the event.

At present, treatment teams may use mock-ups that are milled or printed to give their patients a clearer sense of what their prospective smile may look like. Dr Irena Sailer and dental technician Vincent Fehmer presented a case in which they offered their patient three different mock-ups to try in: a perfect aesthetic version, a version with a diastema and another one in which teeth #22 and #22 were rotated around their axes. These digitally prepared mock-ups facilitated the conversation with the patient and made it possible for her to choose her own prospective smile. The mock-up of her choice was then finalised using digital technology. “This is as easy as copy and paste,” said Fehmer.

Dental technicians can expand their digital library with every clinical case that is used in the planning of other cases. The Cofar–Stumpf team knows how to use the library to their advantage. Both team members have studied the dentition of many patients and have turned the basics of aesthetics upside down when it comes to shape and symmetry: their result proves that the shape of the face does not always conform to the shape of the tooth and some asymmetry may be present—especially in the case of smiles that appear natural and 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

By DTI

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 custom 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 complete, it can be sent via message to the supplier or laboratory, or the system can be customised so that it can flow directly into an existing electronic ordering system.

“We soon realise that dentistry could logically benefit from next-gen voice assistants. This is a logical extension of our offerings,” said Rosen. “As a prosthodontist, my hands serve as the tools of my trade. I’d rather they be working to create a great smile than typing orders into a computer or cellphone. With voice technology, my hands are free to work and put my focus where it belongs—on the patient.”

Companies using Awrel’s voice capabilities can also provide their customers with Awrel’s ready-to-download, text-based and collaboration tool for HIPAA-compliant sharing, and the storage of messages, images, documents and scans.
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 repeat scans 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 3-D imaging specialist Mikko Lilja explained the mechanism of the solution. ‘In tomographic reconstruction, the assumption is that the measurements—in this case the CBCT 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 Practitioner Regulation Agency (AHPRA) in the specialty of dentomaxillofacial radiology—a criterion that only very few dentists fulfil. 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. While the appropriate implant solution can vary depending on the patient’s oral health, anatomy, quality and quantity of bone, and financial resources, full-arch prostheses have progressed to the point where virtually every patient can have his or her teeth restored.

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 ø 3.7 mm Inclusive Tapered Implants (Glidewell 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 tacked 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).

Fig. 6: Conventional dentures were fabricated in advance of the surgical appointment so that they could be immediately converted to serve as temporary appliances during the healing phase—Figs. 7a & b. Same-day conversion of the maxillary denture to an immediate fixed prosthesis was achieved by adding multi-unit temporary cylinders using self-curing acrylic and trimming the appliance into a horseshoe shape—Figs. 8a & b. Note the dramatic change in the appearance of the patient, who left with chairside-converted dentures in place on the same day as surgery, including a screw-retained fixed provisional for his upper arch—Fig. 9. Post-op panoramic radiograph illustrates all-on-4 configuration of maxillary implants and axial placement of the mandibular implants, which would facilitate a passive fit of the mandibular overdenture—Figs. 10a & b. The patient returned 14 weeks after implant surgery, and healing of the peri-implant tissue had progressed nicely. —Fig. 11a. Note that a closed-tray impression was taken for the mandibular implant overdenture. —Figs. 12a & b. This would enhance retention of the overdenture while allowing the possibility of upgrading to a fixed restoration at a later time. After the creation of the osteotomies, the implants were placed (Figs. 13a & b).
on their speech and masticatory capabilities. For this reason, it is important to make every effort to ensure that the patient leaves with functional appliances in place.

Thus, conventional dentures were fabricated from preliminary impressions in advance of the surgical appointment for modification and delivery after placement of the implants (Fig. 6).

Sufficient primary stability having been achieved, the inclusive tapered implants placed in the patient’s maxilla could be immediately loaded. Thus, the maxillary denture would be trimmed and modified chairside to connect to the multi-unit abutments through temporary cylinders (Figs. 7a & b).

This would satisfy the patient’s desire to leave the surgical appointment with a fixed, fully functional maxillary prosthesis in place.

Note that the two most distal molars were removed to minimise the cantilevers and the forces transmitted to the implants during osseointegration. Healing abutments were placed on the mandibular implants to begin developing the transcuspal passages.

The mandibular immediate denture was then modified and relined to seat over the implants during healing. This approach provided the patient with a temporary day-to-day restoration, 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 (Figs. 8a & b).

The final radiograph taken after seating the temporary appliances confirmed excellent positioning of the implants (Fig. 9).

The patient returned after 14 weeks for healing of 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 (Figs. 10a & b). Polyvinylsiloxane (PVS) impressions were taken to begin the restorative process (Figs. 11a–c).

Because multi-unit abutments and healing abutments were placed on the day of surgery, the restorative process began above the tissue level, without any need for secondary surgery or anaesthesia. The restorative protocol for both prostheses included wax rims and set-ups, which the laboratory produced on the working casts fabricated from the impressions (Figs. 12a & b).

The maxillary wax rim incorporated temporary cylinders through which screws could connect to the dental implants. The mandibular wax rim was designed to seat over Locator attachments. At the next appointment, the wax rims were seated, the jaw relationship was recorded using a conventional denture technique and a bite registration was taken (Figs. 13a & b). A PVS wash impression of the mandibular arch was also taken with the wax rims and Locator impression caps in place (Fig. 14). This would aid the laboratory in designing an overdenture that fully rested on the tissue instead of the implants. The case was returned to the laboratory, and wax set-ups were produced (Figs. 15a–c). During the try-in appointment, the wax set-ups were evaluated to confirm the vertical dimension of occlusion, interarch relationship, phonetics, aesthetics, maline arrangement of the teeth, tooth colour and shape, incisal edges and function (Figs. 16a–c).

After final approval of the wax set-ups and final maxillary impression, 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 prosthesis. These extra measures were taken to make absolutely certain that the 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 (Figs. 17a & b). 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 approved wax set-ups and final maxillary impression were returned to the laboratory so that the final mandibular implant overdenture and maxillary provisional implant prosthesis could be produced. The final mandibular appliance was fabricated on the master cast and included recess wells in which metal housings with overdenture caps would be secured chairside (Figs. 18a & b).

These denture caps provide retention and stabilise the prosthesis.
The interocclusal relationship was verified with the final mandibular and provisional maxillary appliances in place. — Fig. 21a & b. The metal housings of the overdenture caps were seated over the Locator attachments. — Fig. 24. 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. — Fig. 26. The black processing inserts were replaced with the appropriate retentive caps, which are colour-coded according to strength. — 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 provisional implant prosthesis fitted perfectly and its tooth positioning, function and aesthetics were verified with both appliances in place, the interocclusal relationship was checked (Figs. 22a & b). Minor occlusal adjustments were made directly to the appliance could be included in the definitive prosthesis design. With the final mandibular restoration in place, the patient wore the provisional full-arch implant prosthesis for a trial period of two weeks (Fig. 25). This opportunity to wear the appliance during actual day-to-day function instilled a high degree of confidence in the prosthetic design for the patient and dentist alike. After patient approval, the provisional implant prosthesis was returned to the laboratory so that it could serve as the blueprint for the final restoration and the minor adjustments made to the appliance could be included in the definitive prosthesis design.

The definitive maxillary restoration 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 prosthetic possibility for his maxilla and 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.

Dr Parnesh B. Patel is a co-founder of the American Academy of Small Implant Dentistry and has worked as a lecturer and clinical consultant on dental implants for various companies. He has been in private practice in Lenoir and Mooresville in North Carolina in the US since 1998 and can be contacted at parneshpateldds2@gmail.com.
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