HK takes first step to regulate dental bleaching

HONG KONG: The government in Hong Kong has proposed new legislation that would make it illegal for beauticians to perform dental bleaching and other cosmetic procedures classified as high-risk medical procedures. In the new guidelines under the Medical Registration Ordinance, only officially registered dentists and physicians would be permitted to do so, representatives of the Food and Health Bureau announced.

In addition to tooth whitening, the legislation would apply to Botox injections, chemical exfoliation and hyperbaric oxygen therapy. It is expected to come into effect in a few months from now once it has been accepted by a Legislative Council panel.

Cosmetic procedures offered at beauty spas and salons have become a thriving business in China’s Special Administrative Region, which has raised concerns about the safety of risky procedures undertaken by non-professionals. Several incidences have occurred in the recent past, including the death of a 14-year-old woman who had undergone blood transfusion therapy at a 13 beauty centre in the Causeway Bay area last autumn. Since then, professional organisations like the Hong Kong Dental Association have repeatedly urged the government to address loopholes in current regulations that allow non-professionals to perform procedures that could potentially harm patients’ health or place their lives at risk.

"Tooth whitening is a chemical procedure that can cause irreversible damage to human teeth if handled improperly," council member Dr Alfred Yung told the newspaper South China Morning Post earlier in July. "Intra-oral treatment and dental procedures like tooth bleaching provided by non-dental or non-clinical professionals therefore pose a threat to public health and should be banned."

With the proposed guidelines, Hong Kong is following other countries in the region that revamped their tooth-whitening regulations. New Zealand, for example, recently restricted the over-the-counter sale of tooth-whitening products with a high concentration of hydrogen peroxide. Earlier this year, Australia also changed its poison standard to stop the sale of tooth-whitening products containing more than 6 per cent of the harmful chemical.

The government announced that Dr Kenneth Mala-ment, a well-known prosthodontist from New York in the USA, will be holding a three-day lecture series on the integration of aesthetic dentistry into routine and complex prosthodontics in India this month.

In addition to the science and controversies involving modern dental materials, he will be discussing the concerns and factors for prosthodontists when working with patients who insist on aesthetic procedures, the dental material manufacturer said.

The lectures will take place from 26 to 28 November in the cities of Bangalore, Chennai and Mumbai. Dentists interested in attending can register through the Ivoclar Vivadent India website.

Malament on tour in India

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Australia to evaluate implementation of rapid oral HIV tests in dental practices

Daniel Zimmermann
DT Asia Pacific

SYDNEY, Australia: HIV infections in Australia jumped by 10 per cent last year, according to recently published figures from the University of New South Wales in Sydney. A group of researchers are investigating whether dental practices and pharmacies could help stop the further spread of the virus by diagnosing more people who are infected and not aware of it through rapid oral HIV testing.

The trial, conducted in collaboration with the University of Sydney’s Faculty of Dentistry, Western Sydney Sexual Health, and Sydney School of Public Health, is currently being conducted in the states of New South Wales, Victoria and Queensland. It seeks to examine knowledge of HIV, attitudes towards people living with HIV and the willingness of Australian dentists to conduct rapid HIV testing, lead researcher Dr. Anthony Santella told Dental Tribune Asia Pacific.

He said that studies on the willingness of dental patients to accept such testing were begun recently. Depending on the test results, the team will also investigate how to implement them in practices that operate in neighbourhoods with high HIV prevalence rates in cities like Sydney. This step is anticipated for next year.

“Evaluations would also need to be done to explore whether it is cost-effective to implement rapid HIV testing in the dental setting versus other settings,” Santella added. “Assuming it is cost-effective, we would then explore reimbursement mechanisms so dentists and possibly other dental professionals could bulk bill the government for the test.”

Rapid HIV tests have been available to medical practitioners in Australia since late 2012, but the country has been slow to implement them. The OraQuick ADVANCE Rapid HIV-1/2 Antibody Test developed by US company OraSure Technologies and used in the trial has not yet received approval from the Australian Therapeutic Goods Administration. It has been available to dental practitioners in the USA since early last year, when it was approved by the Food and Drug Administration. The latest studies suggest that rapid HIV testing in dental practices could increase testing frequency among regular testers, as well as testing rates.

According to the Kirby Institute at the University of New South Wales, about 25 per cent of HIV cases in Australia are undiagnosed. In total, more than 51,000 infections were reported in 2011, with almost every second one occurring in the state of New South Wales.
Motherhood clouded by dental problems

In a nationwide study conducted by the Tokyo Medical and Dental University and the National Cancer Center, it is suggested that the more children a woman has had during her life, the more likely it is that she has fewer functional teeth.

In the study, female participants were compared with male participants, among whom no relation between their number of teeth and number of children was found. The researchers therefore suggested that there might be a number of pathological and socio-behavioural factors that may promote tooth loss among high-parity women. In order to address this, greater effort regarding the information made available and management of a woman's dental health during pregnancy is essential, they recommended.

The study, supported by the Ministry of Health, Labour and Welfare, was conducted between 2005 and 2006, and involved more than 1,500 women and men recruited from two national dental surveys done in 1990 and 2005. Women who had given birth to two children constituted the largest group. Every fourth woman in the study had given birth to three children, and one in thirty women had given birth to four children. Similar figures regarding number of children were reported for the men in the study.

According to the researchers, it is the first study of its kind in Japan.

Motivations of dental students differ widely

SHENYANG, China/FUKUOKA, Japan: Through a rare comparison, dental researchers from universities in China and Japan have gained new insight into the motivations of young people studying dentistry in both Asian countries. Among other findings, the study revealed that Chinese students appear to have chosen the profession primarily for its financial benefits and gain of personal prestige, while their fellow students in Japan reported that they had chosen the field to help people and out of personal interest.

According to the paper, money or social status was the decisive factor for enrolling in a dental school for almost every third dental student in China. Only one in five said that they had a higher motivation for studying dentistry. One in three admitted that they had chosen dentistry for no particular reason.

In Japan, however, more students appear to have actively chosen a career in dentistry. Family was also found to be a major motivation, which indicates that a significant number of dental students in the country are from a dentistry background and plan to continue their parents' family business after they have graduated.

With regard to career choices, more than half of all dental students in Japan want to become a general dentist. This differs significantly from the Chinese students, who want to specialise or pursue a master's degree. The researchers said that this could be because the income of general dentists is very low in the country even though there are too few dentists to treat its population of one billion adequately. They suggested that the country will need to reform its dental education system to address this gap by attracting students through better incentives.

The participants in the study, published in the latest issue of the International Dental Journal, were fifth- and sixth-year dental students from dental schools in Shenyang in China and Fukuoka in Japan.

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Dear reader,

During a Greater New York Dental Meeting a couple of years ago, I had the rare opportunity to speak to one of the first dentists in the USA and worldwide to have introduced rapid oral HIV tests to a dental practice. I can vividly remember her enthusiasm concerning the new technology in my interview with her. Since then, few of her colleagues have followed her example unfortunately. It is thus encouraging to see that Australia—the first country in our region to do so—is now evaluating the feasibility of implementing these tests in dental practices nationwide. However, even if these tests do gain acceptance by the dental community there, this measure is only a drop in the ocean. Particularly in the Asia Pacific region, millions of new HIV infections are expected to occur in the years to come owing to sex trafficking and other reasons. It will require more and continuous efforts by the medical and dental communities to slow the spread of the virus.

Yours sincerely,
Daniel Zimmermann
Group Editor
Dental Tribune International

A controversial topic in dentistry

Cosmetic dentists around the world routinely perform various diagnostic and therapeutic procedures that involve occlusion. Smile aesthetics and occlusion have not been answered with scientific certainty and there are many diverse and polarised opinions regarding this.

In their undergraduate education, dental students are not fully trained in the science and art of both smile aesthetics and occlusion. When these new graduates enter into clinical practice and begin undertaking complex clinical cases, many become confused with the numerous theoretical recommendations and varied concepts about cosmetic dentistry and occlusion in academic and clinical dentistry. In order to understand the core relationship between smile aesthetics and occlusion, a clinician must be familiar with the pros and cons of all the popular concepts and theories regarding smile aesthetics and occlusion, and based on this select the most conservative treatment that is best suited to the patient and that will ensure health and function. With this in mind, two global educational academies, namely Minimally Invasive Cosmetic Dentistry, or MiCD, and Teeth, Muscles, Joints and Airway Harmony, or TMJA, have been established with the aim of promoting healthy, comprehensive dentistry by disseminating the relevant knowledge and information regarding various concepts, theories and clinical protocols concerning smile aesthetics and occlusion.

I am pleased to mention here that recently the Faculty of Dentistry of Thammasat University in Thailand and the Vedic Institute of Smile Aesthetics in Nepal, along with three supporting partners, signed a memorandum of understanding to establish the MiCD and TMJA Harmony International Training and Treatment Center at the Faculty of Dentistry of Thammasat University. This centre will coordinate with various like-minded clinicians, academics and researchers working in the field of cosmetic dentistry and offer structured, skill-based training in MiCD and TMJA harmony dentistry especially for dentists in the Asia Pacific region.

Dr Sushil Koirala maintains a private practice that focuses primarily on MiCD in Kathmandu, Nepal. He is also Editor-in-Chief of our sister publication cosmetic dentistry. He can be contacted at skoirala@twlink.com.np.

Yours sincerely,
Daniel Zimmermann
Group Editor
Dental Tribune International

The maturation of tissue engineering in association with digital technology and its application to clinical surgical procedures will soon create a new paradigm.

Dr Isabella Rocchietta performs clinical work in periodontics and implant dentistry in London. She can be contacted at isabella.roccchietta@gmail.com.
Christopher H. Fox

The adoption of the Minamata Convention in Japan recently made way for discussions on best environmental practices for dental amalgam.

“Reach a point where dental restorative materials are rare for everybody”

An interview with Christopher H. Fox, Executive Director of the International Association for Dental Research

The reason for the agreed-upon phase-down is solely the environmental and health effects of mercury in the environment, not the direct health effects of the use of dental amalgam.

Christopher H. Fox

The symposium at the recent FDI Annual World Dental Congress in Istanbul was actually a much-condensed summary of a two-day workshop held in December 2012 at King’s College London. In brief, yes, we can have much-improved, innovative dental restorative materials, but it is going to take a significant commitment from government funders, academia and industry. Keep in mind that even if a new material could be developed within a one- or two-year timeframe, clinical safety and effectiveness trials and regulatory approvals will take significantly more time. Practising dentists have an important role here too, as they can participate in research networks evaluating new materials and identifying research questions, not to mention advocating for research funding with policymakers in their country.

For a more complete answer to your question, I would refer your readers to the proceedings, which have just been published in the November issue of the Advances in Dental Research, an e-supplement to the Journal of Dental Research.

With the advent of preventative dentistry, stem cell research and the sophistication of tooth replacements, will restorative materials become obsolete someday?

Dental restorative materials are already obsolete or nearly obsolete for the socially advantaged post-fluoride generation. Our greatest challenge is addressing the oral health needs of socially disadvantaged and vulnerable populations. The IADR has a research agenda to reduce these oral health inequalities across populations and hopefully we will reach a point at which dental restorative materials are rare for everybody.

Thank you very much for the interview.

Dental Tribune Asia Pacific Edition

World News

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“A Better Provider of Oral Health”

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Thank you very much for the interview.
MURCIA, Spain: Surgeons have demonstrated the medical applications of Google Glass, an advanced new device that can take pictures, record videos and surf the Internet, by using it for the first time for streaming of a dental procedure in real time.

In October, three dental surgeons at Hospital de Molina in Murcia in Spain conducted a historic maxillofacial surgery at a master class. The clinical procedure, performed by Drs Pedro Peña Martínez, Juan Francisco Piqueras Gómez and Alejandro López Gómez, was part of a 3-D diagnostics and treatment surgery course at the hospital's dental clinic and was attended by dentists from all over Spain.

The clinic's programme provides training to dentists, and achieved an international milestone by using Google Glass to transmit a complex maxillofacial surgery live for the first time.

The surgery was performed on a 70-year-old patient with a fully edentulous maxilla using a computer-guided implant technique pioneered by Dr Peña in Spain. The computer-guided surgery system allows surgeons to plan the clinical case.

A 3-D model of the patient's maxilla is created, which shows the position in which the implants are to be placed. A surgical guide is then fabricated to place the implants. In an hour, the patient has a complete prosthesis on dental implants.

The advantages of this implant system are accurate diagnosis, reliable information on bone quality, predictable treatment, reduced surgery time by avoiding the need for incisions and bone exposure, and shorter recovery time.

Using Google Glass in such a procedure has the additional benefit of allowing direct communication between the surgeon and the audience. The surgeon at the master class can interact with and answer questions from attendees, all of whom are able to see the procedure via the Google Glass broadcast.

The Google Glass device is a head-mounted wearable computer available only on a trial basis. It displays information and can communicate with the Internet via natural language voice commands. It is part of Google's Project Glass, a research and development initiative, which has worked on other futuristic technologies, such as driverless cars.

The technological advancement at the hospital was made possible by Droiders, a Spanish company that develops applications for Google Glass. According to representatives of the hospital, the procedure is an example of its commitment to providing high-quality training to professionals using the most advanced technologies.

The surgical procedure has attracted widespread media attention, as this new technology creates new possibilities for professional education in dentistry.
Caries bug may contribute to composite degradation

Dental Amalgam Phase-down Project in Tanzania

Amalgam phased down in Africa

DAR ES SALAAM, Tanzania: As reported by Daily News, a Tanzanian online newspaper, the East Africa Dental Amalgam Phase-down Project has been successfully implemented in Kenya, Uganda and Tanzania. Among other objectives, the project will investigate supply and trade patterns, and encourage switching to alternatives to dental amalgam in the three countries. Under the co-ordination of UNEP Chemicals, the centre for all United Nations Environment Programme activities concerning chemicals, and the World Health Organization’s Global Oral Health Programme, the ministries of Environment and Health in Kenya, Tanzania and Uganda will be collaborating with the FDI World Dental Federation, International Dental Manufacturers and their respective national dental associations to explore essential conditions for a phase-down in the use of dental amalgam.

Over a period of a year, the project will investigate the current supply and trade of dental amalgam and materials alternative to amalgam. It will also assess the current waste management practices, create awareness of preventive dental care and encourage a switch to appropriate alternatives to dental amalgam among dentists and patients. In addition, the project is aimed at environmentally sound management of dental restoration material waste in selected dental facilities. However, Prof. Veerabomi Kokulengya Kahabuka, project coordinator in Tanzania and Associate Dean of the School of Dentistry at the Muhimbili University of Health and Allied Sciences, cautioned: “Even with the success of the pilot project, Tanzania faces inadequate funding to roll out to all dental facilities across the country.”

Amalgam, which contains up to 50 percent mercury, remains one of the most widely used restorative materials worldwide. Although scientists have expressed concerns about its possible adverse health effects, especially among younger patients, the chemical has been linked to kidney, brain, and neurological damage, as well as damage to the digestive tract. It one of the major reasons for dental resin composite replacement. A Canadian study has recently provided new evidence that Streptococcus mutans, an oral bacterium that causes tooth decay, compromises the resin-dentin interface and thus contributes to dental resin composite and adhesive degradation over time.

In collaboration with the University of Toronto’s Institute of Biomaterials and Biomedical Engineering, researchers at the university’s Dental Research Institute studied standardised specimens of resin composite, and total-etch and self-etch adhesives that were incubated with Streptococcus mutans for 50 days. Electron microscopy scans of the specimens’ surfaces after the period found that all materials incubated with Streptococcus mutans showed increased degradation compared with controls. In addition, a trend of increasing bis-hydroxy-propoxy-phenyl-propionate release, a Bis-GMA-derived biodegradation byproduct, throughout the incubation period was observed for all materials and this was more elevated in the resin composite material and self-etch adhesive specimens in the presence of the bacteria.

The study, titled “Cariogenic Bacteria Degrade Dental Resin Composites and Adhesives,” was published online on Sept. 11 in the Journal of Dental Research ahead of print.
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Glidewell and SHOFU partner

KYOTO, Japan: In extending its portfolio of dental products to Japan, Glidewell Laboratories has recently granted SHOFU in Kyoto exclusive distribution rights for BruxZir Solid Zirconia and BruxZir Shaded. The materials, which are recommended for monolithic dental restorations, will be available to dentists throughout the country by the beginning of December, the US manufacturer said.

The partnership is Glidewell’s first entry into Asia’s largest dental market. Besides Japan, it currently distributes BruxZir Solid Zirconia in several other countries in the region, including Korea, where it was introduced to dental professionals late last year. The company also collaborates with dental laboratories in Australia, among others, noting that zirconia restorations are becoming very popular in the USA, and we expect these new regions to contribute greatly to the growth of BruxZir Solid Zirconia. SHOFU has an excellent global reputation and an exceptionally strong presence in Japan through its wide range of proven restorative products,” a company representative told Dental Tribune Asia Pacific. She said that her company plans to extend its relationship with SHOFU in the years to come to grow its respective business.

Introduced to dental markets in 2009, BruxZir Solid Zirconia is indicated for crowns, bridges, implants, lineals and onlays. Glidewell also markets the material as an aesthetic alternative to porcelain-fused-to-metal occlusal/buccal or full cast restorations. More than 5.6 million restorations have been placed worldwide since it was introduced five years ago, she said. Recently, the material was named Top Long Term Performer by THE DENTAL ADVISOR in the USA.

According to the Millennium Development Group (MDG), India’s most recent dental statistics show that India has approximately 250,000 practicing dentists, with each dentist doing an average of 500-600 cases per year. However, the private sector has the predominance of dentists, as the public sector is usually dominated by government-sponsored dental schools.

“Small-scale and medium-scale dental practices driven by affordability and accessibility concerns are the backbone of India’s dental sector, and as the market for dental implants grows, the country’s share of the global market is expected to rise,” said Mr. Neeraj Sawhney, CEO of Neodent, a leading dental implant company in Brazil, in an interview with Dental Tribune Asia Pacific.

Asian biomedical companies combine research activities

BANGALORE, India/SINGAPORE: Indian Stelis Biopharma and Bio-Scalpford International (BSI) from Singapore have announced that they have signed a collaboration agreement that will see both companies combining their research activities in the development of medicine- and stem cell-loaded devices for the treatment of various medical and dental conditions.

The companies have signed a joint development agreement, which will see both companies combine their research activities in the development of medicine- and stem cell-loaded devices for the treatment of various medical and dental conditions. The joint venture in Malaysia or Singapore is planned to seek investors to support the projects. Research activities will be jointly directed by the CEOs of both companies, Dr. Anand Iyer and Margam Chandrasekaran. The financial details were not disclosed.

Formerly Rapid-Tech, BSI began developing biocompatible 5-13 devices for use in fields of tissue engineering in 1999. Among other achievements, the company won the poster competition at the 2009 Annual World Dental Congress of the FDI World Dental Federation in Singapore with its presentation on Alvevac, a P.L.G.A. and poly (ethyl alcohol) based synthetic scaffold designed for the preservation of the alveolar socket after tooth extraction, which is currently available to dentists in India, Hong Kong, Taiwan and the UK.

The company also has research partnerships with dental institutions in the region, including the Saveetha University dental school in Chennai in India. A subsidiary of biomedical company Strides Arcolab from Bangalore, Stelis Biopharma specialises in the development and production of medicine- and stem cell-loaded biomedical devices. According to its own figures, the publicly listed company currently maintains operations in six countries, including India and Malaysia.

BRIC dental implant markets to see rapid expansion

TORONTO, Canada: According to a new report, the Brazilian, Russian, Indian and Chinese (BRIC) markets will be the fastest-growing dental implant markets worldwide in the next few years. It is believed that they will reach $1.3 billion in 2021 owing to the rising number of dentists learning to perform implant procedures and the increased importance of local low-cost competitors for the international dental industry.

“The price competition will be less prevalent in China than in Russia, India or Brazil,” said MRG analyst Jeremy Svatich. “Chinese dentists place greater emphasis on brand names and premium products because it improves the appearance of their practices to patients. The majority of patients undergoing dental implant treatment in China continue to be part of a wealthy social class and they are more likely to request higher-priced brands. As a result of this trend, the aggregate selling price in China was more than double that of the other BRIC countries in 2012.”

MRG also stated that low-cost products will gain more importance as price competition intensifies worldwide. Although the increasing availability of low-cost products will make dental implant procedures more accessible to patients, this trend will ultimately impede revenue, MRG suggested. Therefore, international competitors, particularly in Brazil, will be looking to meet growing demand for implants by acquiring local low-cost companies to offer low-cost products alongside their premium devices.

“Demand for implants is increasing in Brazil, generating wellness among patients and dentists. This trend will continue to grow as more dentists choose to offer implants to their patients,” said Stirling J. Symons, CEO of Neodent.

According to the World Dental Federation (WFD), Brazil currently represents the largest of the BRIC markets, accounting for over 50 per cent of all dental implant revenues. Dental implants have been available in the country for a long time and many Brazilians seek this treatment owing to a high level of aesthetic consciousness in the society.

With regard to market expansion, however, MRG predicts that the less mature Russian, Indian and Chinese markets will have greater growth, with the dental implant market in China experiencing the strongest development.

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“In 2012, for instance, Straumann acquired a 49 per cent stake in Neodent, a leading dental implant company in Brazil. The report, titled “BRIC Markets for Dental Implants 2015,” can be accessed on MRG’s website.”
Detecting dental caries: Is there anything new?

An overview of the latest technologies and their clinical potential

Dental caries is still one of the most prevalent but preventable diseases in the world. There is increasing evidence that those with poor oral health have poorer general health outcomes as well. Whether this is a causative relationship or an association with other co-factors is yet to be determined.

Even though a large proportion of the population in developed countries have seen improvement in their oral health over the past three or four decades, individuals from certain groups, such as lower socioeconomic groups and the medically compromised, are still at high risk of developing dental caries. There has been a change in the philosophy around what is considered appropriate treatment, with a move away from the surgical model to a disease management model, often termed minimum intervention dentistry. As a result of the decline in caries experience, the sensitivity of caries diagnosis has been reduced. Early diagnosis is vital, as it allows intervention to remineralise or heal the carious lesion, without damage to the tooth surface, caries detection involves the use of an objective instrument to detect the disease in the form of carious lesions, with assessment characterising and quantifying the extent and status of disease.

The development of the International Caries Detection and Assessment System (ICDAS) for the quantification of carious lesions has recently provided a valid method for assessing and quantifying lesions, and the recent addition of an associated management system, the International Caries Classification and Management System (ICCMS), provides evidence-based management options for the various stages of the carious lesion, allowing for individual circumstances. ICDAS rates lesions from a score of 1, to a complex intra-dentinal lesion detection, with the technology. In order to achieve the best results, the technique to check enamel surface integrity/roughness.

The sensitivity of a detection method relates to its ability to detect the disease when it is present, and the specificity relates to the ability to detect the absence of the disease when it is not present. Occlusal caries detection is complicated clinically by surface morphology, past fluoride exposure, anatomical fissure topography, and the presence of plaque and stains. Commonly used methods for this type are visual and tactile inspection, radiography, transillumination and laser fluorescence. This method, namely DIAGNodent (KaVo), is promoted for use for both occlusal and interproximal lesion detection, with the technology based on the fluorescence of porphyrins excited by laser light at a wavelength of 655 nm (Figs. 2a & b). The sensitivity and specificity of laser fluorescence in detecting intra-dentinal lesions varies greatly, with false positives, the major limiting factor of the technology. In order to achieve the best results, the angulation of the tip should be consistent, and the results should be seen in conjunction with other detection methods, not as a stand-alone gold standard.
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Recently developed quantitative light-induced fluorescence systems (including QLF, Quantum Dental Technologies, and SOPROLIFE, Acteon) utilise differences in auto-fluorescence between sound and demineralised enamel and dentine (Fig. 3). Demineralised enamel appears darker than the adjacent sound tooth structure, and the carious dentine fluoresces red depending on the filters used. The use of QLF (wavelength 405 nm) enables the early detection of enamel demineralisation, and it may be used to discriminate between affected and infected dentine. Like DIAGNOdent, QLF technology is reliant on standardised techniques, especially control of ambient light, and the results must be seen in conjunction with other methods. SOPROLIFE uses a longer wavelength of 450 nm, and has settings for the diagnosis of carious dentine, as well as a treatment mode, which assists in determining which dentine should be removed. A new system recently released uses laser-based photothermal radiometry (The Canary System, Quantum Dental Technologies), detecting luminescence and change in temperature to quantify mineralisation changes (Fig. 4). Further research is required on this technology.

The method of fibre-optic transillumination is based on the principle that sound tooth structure has a higher index of light transmission than a carious tooth. Units such as the SDI diagnostic tip for SHF's light curing unit or the NSK transillumination handpiece are simple to use. The light source is placed on the buccal or lingual side of the tooth as in Figure 5 illustrating the head of the SDI unit. Transillumination is primarily used for the detection of proximal carious lesions, although studies have indicated it can also improve visual detection of occlusal lesions. Carious lesions limited to the enamel appear as grey shadows, and those in the dentine appear as orange-brown or bluish shadows.

The use of digital radiography has become commonplace among many practitioners. The detection capabilities of digital radiography are reported to be similar to that of film-based methods, and have the benefit of reduced radiation exposure and the ability to readily transfer the images.

The recent development of multilume disclosing gels (Tri Plaque ID Gel, GC Corporation) may aid caries detection, as old and cariogenic plaque can be identified relatively easily—and white spots tend to occur under older plaque, so this can target the areas to be investigated after gel removal. These products are potentially good for patient education, as the area of risk can be easily pointed out to the patient.

Obtaining diagnostic reproducibility between examiners is difficult, as clinicians tend to develop individual concepts based on experience regarding caries detection and the subsequent preventive or restorative treatment options. Length of experience also contributes, with experienced examiners having higher sensitivity, higher specificity, and greater reproducibility than those less experienced. Owing to the lack of a single detection method that provides both high sensitivity and high specificity, combining a number of methods is recommended to increase the accuracy of detection. For example, this may mean combining DIAGNOdent or SOPROLIFE findings with direct visual and radiographic images. Several factors, such as fluorescent lighting, can upset the results of fluorescent-based detection methods, so care in control of ambient lighting and standardisation of methodology is imperative when using these new detection methods.

The development of new technologies to assist in the detection and diagnosis of caries can provide increased reliability; however, they must be used in the context of traditional visual and radiographic assessment still being the gold standards of care at present. The current development of ICCMS by a worldwide group of cariologists will use ICDAS and the current evidence base to provide information that will allow clinicians to use information such as lesion characteristics and caries risk to formulate valid treatment decisions.
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Clinical case by Dr. Fred Calavassy - Veneers

Dr. Fred Calavassy currently maintains a private practice in Sydney, Australia centred around his passion for comprehensive aesthetic rehabilitation. He is a fellow and clinical instructor for the prestigious Las Vegas Institute for Advanced Dental Studies, completing courses in aesthetic reconstruction and advanced neuromuscular occlusal philosophies. He continues teaching for LVI Australia as a featured clinical instructor.

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“...a great diversity in the knowledge and skills that universities provide in their undergraduate programmes.”

An interview with Dr Nikos Mattheos, Hong Kong

While dental implantology has seen tremendous growth in the last 20 years, education standards for the field, particularly at university level, are still lacking. A recent European consensus workshop on implantology education in Budapest in Hungary sought to discuss ways to assure quality and effective education in implant dentistry. At this year’s EAO congress in Dublin, Dental Tribune International spoke with Dr Nikos Mattheos, one of the organisers of the workshop. The Faculty of Dentistry of Hong Kong University is one of the few universities in Asia Pacific to include implantology in their undergraduate curriculum. Dr Mattheos revealed the reasons for such an inclusion and the reason the field does not qualify to be an independent specialty.

Dental Tribune International: Dental implants have gained a negative image recently in countries like Japan. Is this perception due to perverted use by the media, or to some extent to a lack of education on the role of the dentist in placing dental implants?

Dr Nikos Mattheos: It is true that a negative perception of implant dentistry recently affected the whole of implant dentistry in Japan. Many patients believe that they have little to lose by dismissing implant dentistry. Implant dentistry is not always the best treatment and the clinician should always counsel the patient accordingly. Implant dentistry is and will always be a delicate area and the media, or to some extent to a lack of education on the role of the dentist in placing dental implants.

Dr Nikos Mattheos (DTS/Photo Daniel Zimmermann)

...a great diversity in the knowledge and skills that universities provide in their undergraduate programmes.

To be more precise, there is discrepancy between what a general dentist is expected to know/perform in implant dentistry and what the current education in most schools is teaching. Nowadays, a general practitioner or her patients the treatment option of dental implants when indicated, regardless of whether he or she will undertaking the placement himself or herself or just the restorations of the implants. Moreover, a general practitioner must be able to maintain patients with dental implants and clinical education components have been introduced. However, it is clear that there is still room for improvement.

Several initiatives to standardise norms and guidelines in implant education already exist. What are the main obstacles to implementing them? In 2008 in Prague, we managed to come up with a consensus on the knowledge and competencies a general dentist today must possess in implant dentistry. It is not a doubt that general practitioners must have a thorough understanding and certain skills, regardless of whether he or she will choose to place or restore dental implants.

What we realised in 2013 however is that although it is relatively easy to identify what a general practitioner needs to know it has proven to be a very difficult exercise to implement this knowledge in the dental curriculum for most dental schools. The lack of time in the curriculum, lack of resources or staff, as well as departmental fragmentation, make the implementation of implant dentistry a challenging task for dental schools. Progress has been achieved nevertheless.

Virtual implant planning and guided implantology have the potential to enhance implant treatment outcomes significantly. Are these technologies of benefit to implant dentistry education or do they make implant dentistry more challenging?

Technology has offered many solutions to clinical problems, and computer aided planning in combination with CAD/CAM technology has been opened up possibilities for efficient and effective treatment of rather complex cases. Although such technologies are certainly promising, there still are challenges related to their application. Many clinicians mistakenly see such technologies as compensating for a lack of clinical experience, as they are often not a guarantee that with the help of guided surgery even a relatively inexperienced clinician can undertake complex treatments with safety and this is a dangerous illusion.

Another limitation is the high cost of such technology, which makes the investment worthwhile only when undertaking relatively large reconstructions. However, there is no doubt that in the hands of an adequately trained clinician computer-guided surgery combined with CAD/CAM technology can improve the quality of service offered to the patient and introduce many new possibilities.

The Dental Council of Ireland currently does not recognise the term “implant specialist.” Does dental implantology need to be an independent specialty?

This is a very hot topic, which was also raised at this congress. Unfortunately, the truth is that many clinicians and societies are self-proclaimed implantologists or implant specialists. This is a misleading, as there is no widely accepted definition of what an implantologist or implant specialist is. Does dental implantology need to be an independent specialty?

Unfortunately, the truth is that many clinicians and societies are self-proclaimed implantologists or implant specialists. An established specialist, for example a periodontist, is someone who has completed an accredited three-year full-time programme, has achieved specific knowledge and competencies as defined by the respective scientific and governmental bodies, and can perform an array of treatments, for which he or she underwent adequate training. However, the term “implantologist” is ill-defined and often misleading, as there is no widely accepted definition as to what an implantologist is (competencies, scope of practice, etc.), nor any structural educational pathways defined for someone to reach such a status. So think the consensus amongst university lecturers of implant dentistry will agree with the Irish dental council and will discourage the use of the terms “implant specialist” and “implantologist” in any context.

Thank you very much for the interview.
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A clinical case involving a crown next to a veneer next to a crown

All-ceramic anterior restorations

Dr Sami Bissasu & Sihan Farah
Syria & UAE

Every intra-oral restorative treatment can change the character of a smile. Therefore, a controlled course of action is indicated. In prosthetic treatment, the achievement of a balanced smile is a very important step towards establishing a natural appearance.

A 22-year-old female patient and dental student presented at the clinic because she was dissatisfied with the appearance of the composite veneers on her maxillary anterior teeth. Moreover, she was unhappy with the inflammation of the surrounding gingiva.

Preliminary impressions were taken to produce a study model, which would provide us with a physical reference on which we could draw lines, straighten long axes, adjust lengths and perform cosmetic contouring in relation to the adjacent teeth. Based on this initial plan, a diagnostic wax-up was made, followed by a silicone index, which is a proven and indispensable tool for the fabrication of temporary restorations and for use as a guide in tooth preparation.

Preliminary treatment and preparation

The treatment plan included the use of custom-made fibre-reinforced composite post and cores owing to the previous extensive preparation of the canals, all-ceramic crowns for teeth 11 and 21, as well as all-ceramic veneers for teeth 12 and 22. The central incisors were prepared for receiving the post and cores. The final impressions of the canals were taken with condensation silicone.

The fibre-reinforced composite post and cores were fabricated in the dental laboratory and cemented after the try-in using the dual-curing composite system Variolink N (Ivoclar Vivadent).

The central incisors were prepared according to the general principles of all-ceramic crown preparation. For this, a 1 to 1.2 mm rounded shoulder was created subgingivally. The lateral incisors were prepared according to the general principles of veneer preparation. A 0.5 mm chamfer was created equi-gingivally with a 0.5 to 0.75 mm buccal reduction. In addition, a 1 mm bevel was prepared at the incisal edge (Figs. 1a & b). The final impression of the maxillary arch was taken using the addition silicone Virtual (Ivoclar Vivadent).

With the help of the silicone index, the temporary restorations were fabricated directly in the patient’s mouth. In this way, she was able to see her expected post-operative appearance.

During the following two weeks, the patient visited the dental practice regularly for monitoring of her peri-oral and gingival situation. No signs or symptoms of discomfort were observed or reported. Furthermore, the healing of the gingival tissue was satisfactory in terms of colour and positioning.

The temporary restorations allowed the patient to become accustomed to her new anterior teeth. At this stage, however, it was still possible to adjust the shape of the restorations intra-orally and to implement these changes in the permanent restorations.

The combination of all-ceramic crowns and veneers simplified the material selection in this case immensely. It was decided to use lithium disilicate, a material that numerous studies have confirmed to be both robust and aesthetic. The final decision was to use IPS e.max Press (Ivoclar Vivadent).

From a saturation point of view, shade A1 was indicated. However, the brightness was higher than that of the LT (low translucency) A1 ingot, especially in the middle third. If a lighter ingot in Bleach shade (LT B1A) had been selected, the saturation would have been too high for the veneers. The HT (high translucency) Bleach ingots might have been an option there had there not been the two crowns in the middle, which may have influenced the level of brightness. Therefore, the LT (Value 1) ingot worked perfectly here, since the data collected from the abutment colour and the thickness of the diagnostic wax-up were not contrary to the planned result.

It is generally recommended that the shade be selected in daylight. In this aesthetically demanding case, many photographs of the teeth were taken with the flash turned off and while holding lighter and darker shades next to the natural tooth at a similar angle. These were very helpful during the laboratory procedures.

In order to achieve a natural-looking restoration and to increase the light transmission and guarantee the shade match in depth, chroma, value and hue, an identical layering diagram had to be used for all the restorations (veneers and crowns). However, before this layering diagram was determined, the dentine background of the natural preparations from the patient’s mouth had to be transferred to the restorations. This approach ensured a perfect shade match through-out the fabrication procedure up to cementation.

The IPS Natural Die Material (Ivoclar Vivadent) was most helpful in this task (Fig. 1). Only then was the layering diagram created and were the required materials selected from the IPS e.max Ceram (Ivoclar Vivadent) range.

Wash firing was performed on the pressed frameworks. The cervical and proximal areas were characterised with IPS e.max Ceram Stains (Shade and Essence) for the first firing, which enabled not only an optimum shade match but also a lighter shade. For the second
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firing cycle, a thin layer of dentine body material was built up to adjust the long axes and even out the sizes.

The laterals were rotated 3 to 5 degrees on the long axis (mesial out and distal in), which imparted a soft aesthetic and youthful effect.

In general, the dental technician has to be aware that by changing the long axis the light reflective surface of one tooth in relation to another (central-lateral in our case) also changes.

The structure of the mamelons in the mandibular teeth was clearly visible in the photographs. The IPS e.max Ceram Mamelon materials enable the lifelike reproduction of these structures. The natural effect of the mamelons and the opalescence should be achieved by means of the halo effect. From the incisal edge towards the tips of some mamelons, a mixture of Opal Effect 1 and Traspa blue was applied in the middle of the incisal area. Brighter IPS e.max Ceram Impulse materials (OE 5 and OE 4) were used to apply internal characteristics and contrast. The third firing cycle of the Traspa Incisal material served more to improve the shape of the restoration than to give it shade. After firing, considerable time was invested in contouring, surface texturing and finishing.

After the restoration had been finished in the laboratory, the patient came in for a clinical try-in, during which photographs were taken from all angles (Figs. 4–6). The dental technicians had the opportunity to discuss the expectations of the dentist and the patient. At the try-in, it was observed that the left central incisor was a little off-set. This important aspect would have been missed had the restoration not been tried in. The lip line in particular and the integration of the crown into the facial surroundings of the lips are crucial to the technician's work. Subsequently, the necessary adjustments were made in the laboratory. In this case, a slight curving adjustment was made at the incisal edge to complement the feminine character of the patient's face (Fig. 7).

Only after these final adjustments was glaze firing performed, which allowed the restorations to blend in harmoniously with their natural surroundings. Glaze firing is a critical step and its results are greatly influenced by manual polishing, glaze consistency and firing parameters.

The final restorations, now in line with the patient's and dentist’s expectations, were delivered to the dental practice. The maxillary central incisor crowns were permanently seated with Variolink N (base and catalyst), while the maxillary lateral incisor veneers were placed with only Variolink N Base. Fine-grit diamond burs and finishing and polishing rubber heads from the OptraFine range (Ivoclar Vivadent) were used to remove excess cement and to eliminate any occlusal interference. The patient was highly satisfied with the result (Figs. 8 & 9). During the follow-up appointment, another check-up was done and final modifications were made.

Conclusion
The analysis of the components inherent in a soft and delicate smile demonstrated that the lateral incisors (axis, inclination and rotation) have the largest effect on the personality and appearance of a person's smile. It is important to note that if one central is slightly off-set from the other, an asymmetrical and natural look is produced. The dental technician and the patient may require some courage for this approach, but when the aesthetic parameters involved and the art of reproducing them are perfectly understood, the aesthetic result will reward all involved.
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Since the beginning of modern-day endodontics, there have been numerous concepts, strategies, and techniques for preparing canals. Over the decades, a stagnating array of files has emerged for negotiating and shaping them. In spite of the design of the file, the number of instruments required and the surprising multitude of techniques advocated, endodontic treatment has typically been approached with optimism for probable success.

The breakthrough in clinical endodontics progressed from utilizing a long series of stainless-steel (SS) hand files and several rotary Gates-Glidden drills to the integration of nickel-titanium (NiTi) files fashioned to have active cutting edges. This generation of technology required numerous files for achieving the preparation objectives. Rather than identify the myriad of available cross-sections, files will be characterised as having either a passive or an active cutting action.

First generation
In order to appreciate the evolution of NiTi mechanical instruments, it is useful to know that first-generation NiTi files in general have passive cutting blade designs and fixed tapers of 4 and 6 % over the length of the active blades (Fig. 2). From the mid- to late 1990s, GT files (DENTSPLY Tulsa Dental Specialties) became available that provided aftertapers of single files of 8, 10, and 12 %. The most important design feature of first-generation NiTi rotary files was that they had passive cutting blades that helped a file to stay centred in canal curvatures during work.

Second generation
The second generation of NiTi rotary files reached dental markets in 2001. The one feature that distinguished this generation of instruments from previous ones is that they have active cutting edges that require fewer instruments to prepare a canal fully (Fig. 3). In order to prevent taper lock and the resultant screw effect associated with both passive and active fixed-taper NiTi cutting instruments, EndoSequence (Brasseler) and BioFile (FGi Dentaire) provided files with alternating contact points. Although this feature is intended to mitigate taper lock, these files still have a fixed taper design over their active portion. The clinical breakthrough occurred when ProTaper Universal (DENTSPLY Tulsa Dental Specialties) utilised multiple tapers of increasing or decreasing percentage on a single file. This revolutionary, progressively tapered design limits each file’s cutting action to a specific region of the canal and affords a shorter sequence of files to produce deep Schlüterian shapes safely (Fig. 4). During this time, manufacturers began to focus on other methods that could increase the resistance to file separation. Some manufacturers, for example, electropolished their files to remove surface irregularities caused by the traditional grinding process. However, it has been observed clinically and reported scientifically that electropolishing dulls the sharp cutting edges. As a consequence, the perceived advantages of electropolishing were offset by the undesirable inward pressure required to advance a file to length. Excessive inward pressure, especially when utilising fixed-taper files, promotes taper lock, the screw effect and excessive torque on a rotary file during work. In order to offset deficiencies in general, or in efficiencies resulting from electropolishing, cross-sectional designs have increased and rotational but dangerous speeds are advocated.

Third generation
Improvements in NiTi metallurgy became the hallmark of what may be considered the third generation of mechanical shaping files. In 2007, some manufacturers began to focus on using heating and cooling methods for the purpose of reducing cyclic fatigue in and improving safety with rotary NiTi instruments used in canals that are more curved. The intended phase-transition point between martensite and austenite was identified as producing a more clinically optimal metal than NiTi. This third generation of NiTi instruments significantly reduced cyclic fatigue and, hence, broken files. Some examples of brands that offer heat treatment technology are Twisted Files (SybronEndo), HyFlex (Coltene/Whaledent), and GT, Vortex, and WaveOne (all DENTSPLY Tulsa Dental Specialties).

Fourth generation
Another advancement in canal preparation procedures was achieved with reciprocation, a process that may be defined as any repetitive up-and-down or back-and-forth motion. This technology was first introduced in the late 1990s by a French dentist. Recent brands that use that technique include WaveOne and RECIPROC (VDW). WaveOne combines the best design features of the second and third generation of files, complemented by a reciprocating motion that drives any given file in unequal bidirectional angles. The CCW engaging angle is five times the CW disengaging angle and was designed to be lower than the elastic limit of the file. After three CCW and CW cutting cycles, the file will have rotated 560 degrees, or one full circle (Fig. 5). The reciprocating motion allows a file to progress more readily, cut efficiently, and remove debris from the canal effectively.
ProTaper Next

There are five ProTaper Next (PTN) files in different lengths available for shaping canals: X1, X2, X3, X4, and X5 (Fig. 2). These files have yellow, red, blue, double black, and double yellow identification rings on their handles, corresponding to sizes 17.04, 21.06, 25.07, 30.08, and 40.08. The tapers are not fixed over the active portion of the file. Both the X1 and X2 files have an increasing and decreasing percentage taper on a single file, whereas the X3, X4, and X5 files have a fixed taper from D1 to D5, then a decreasing percentage taper over the rest of their active portions.

PTN files are the convergence of three significant design features, which include a progressive percentage taper on a single file, M-Wire technology, and the fifth generation of continuous improvement, the offset design. As an example, the X1 file has a centred mass and axis of rotation from D1 to D5, whereas it has an offset mass of rotation from D4 to D16. Starting at 4%, the X1 file has ten increasing percentage tapers from D1 to D11, whereas there are decreasing percentage tapers from D12 to D16 to enhance flexibility and conserve radicular dentine during shaping.

PTN files are used at 300 rpm and a torque of 2–5.2 Ncm, based on the method used. However, the authors prefer a torque of 5.2 Ncm, as this level of torque has been validated as profoundly safe if clinicians perform meticulous glide path management procedures and utilise a deliberate outward brushing motion as they progressively shape canals.

ProTaper Next shaping technique

In the PTN shaping technique, all files are used in exactly the same way, and the sequence always follows the ISO colour progression and is always the same regardless of the length, diameter, or curvature of a canal. The PTN shaping technique is extraordinarily safe, efficient, and simplistic when attention is focused on access preparation and glide path management. As required for any shaping technique, straight-line access to each orifice is emphasised. Attention is directed to flaring, flattening, and finishing the internal axial walls. For radicular access, the original ProTaper system offers the auxiliary shaping file SX, which is used in a brushing motion on the outside to pre-flare the orifice, eliminate triangles of dentine, relocate the coronal-most aspect of a canal away from external root concavities, or produce more curvature if desired.

Perhaps the greatest challenge in performing endodontic treatment is to find, follow, and predictably secure any given canal to its terminus. Negotiating and securing canals with small manual files requires a mechanical strategy, skillful touch, patience, and dedication. A small hand file is used initially to scout, expand, and refine the internal axial walls of the canal. Once the canal can be reproduced manually, a dedicated mechanical glide path file may be used to expand the working width in preparation for shaping procedures. For clarification, a canal is secured when it is empty and has a confirmed, smooth, and reproducible glide path. With an estimated working length and in the presence of a viscous chelator, a #10 file is inserted into the orifice. Then it is determined whether the file moves towards the terminus of the canal easily. In shorter, wider, and straighter canals, a #10 file can usually be inserted to the desired working length. Once a #10 file has been confirmed to be loose at length, the glide path may be further enlarged with either a #15 hand file or dedicated mechanical glide path files, such as PathFiles (DENTSPLY Tulsa Dental Specialties). The glide path just described confirms that sufficient existing space is available to initiate mechanical shaping procedures with the PTN X1 file.

In other instances, certain endodontically involved teeth have roots with canals that are longer, narrower and more curved (Fig. 4a). In these situations, often a #10 file will not go to length initially. Generally, there is no need to use #6 and/or #8 hand files in an effort to reach the terminus of the canal immediately.
Towards the working length. The X1 PTN file to move inward passively, mence, starting with the PTN X1 file. Patency is established, working length, and confirm apical patency can be reproducibly slip, slide and glide over the apical one-third of the canal.

Once the canal has been secured, the access cavity is flushed volumetrically with a 6% solution of NaOCl. Shaping can then commence, starting with the PTN X1 file. It should be noted that PTN files are never used with an inward pumping or pecking motion. Rather, they are used with an outward brushing motion. This method will enable any PTN file to move inward passively, follow the glide path and progress towards the working length. The X1 file is carried through the access and inserted passively into a pre-flared orifice and secured canal. Before encountering resistance, deliberate brushing on the outstroke has to begin immediately (Fig. 6g). Brushing creates lateral space and enables this file to progress a few millimeters inward. A brushing action serves to improve contact between the file and dentine, especially in canals that exhibit irregular cross-sections or deviations of their rounder parts.

Progression with the PTN X1 file through the body of the canal has to be continued. After every few millimeters of file progression, the mechanical shaping file has to be removed to inspect and clean its flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to irrigate and flush out gross debris, recapitulate with a #10 flutes. Before reinserting the X1 file, it is critical to ir...
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Micro-invasive approach to controlling white spot lesions

Prof. Marcio Garcia dos Santos & Guilherme Martinelli Garone
Brazil

Caries infiltration is an effective treatment in controlling white spot lesions of non-cavitated active carious lesions in vestibular areas. A list of references is available from the publisher.

The standard treatment for white spot lesions includes topical fluoridation and improvement of the patient’s oral hygiene in order to promote remineralisation of the demineralised enamel. Ten years ago a research group at the Charité hospital in Berlin in Germany began developing procedures and materials to control early carious lesions by micro-invasive means, reducing the amount of tooth substance that has to be sacrificed to the minimum. A novel alternative approach to the treatment of white spot lesions, caries infiltration, is based on the concept of sealing the micro-porosities of the lesion body and thereby inhibiting the substrate supply to inhibit the progression of the lesion. In randomised controlled clinical trials, this approach was proven to be clinically effective in halting caries progression. The hyper-mineralised surface layer is removed with a 15 per cent hydrochloric acid gel. In the next step, a specially developed low-viscosity resin is applied to the lesion to infiltrate it, driven by capillary forces. Since the capillaries in a carious lesion are extremely thin, a penetration time of 5 minutes is required to ensure complete infiltration of the lesion. Caries infiltration leads to the formation of artifical plaque retention areas and the formation of marginal gaps.

A positive side-effect of caries infiltration is that the enamel lesions will lose their whitish or brownish appearance, thereby neutralising unfavourable aesthetic effects. Once the micro-porosities have been filled, the light refraction behaviour adapts to that of the surrounding healthy enamel. The light refraction behaviour is described by the refraction index.

Aesthetic improvement of carious white spot lesions is based on the masking effect of these enamel lesions by resin infiltration, which optically adapts the appearance of the lesions to the surrounding healthy enamel. Active lesions or post-orthodontic white spots immediately after removal of fixed orthodontic appliances often have a very thin surface layer. These types of lesions are therefore especially indicated for infiltration treatment and their aesthetic appearance can be improved easily and effectively.

Caries infiltration is an effective treatment in controlling white spot lesions of non-cavitated active carious lesions in vestibular areas.
Product news from Ultradent

Ultradent LC Block-Out Resin provides reservoir space for bleaching trays and is useful for other laboratory procedures such as model and die repairs. It can be rapidly and efficiently delivered with the Black Mini tip. For reservoir spaces, apply Ultradent LC Block-Out Resin approximately 0.5 mm thick onto the labial surfaces. Stay about 1.5 mm from gingival line and do not extend onto incisal edges and occlusal surfaces.

This great utility resin is an instant hard, strong, no-mix material for blocking out undercuts on dies and filling in voids. It must be light cured and is not intended for intra-oral use.

An aqueous, 15.5% ferric sulfate hemostatic solution with a pH of ~1.0, Astringedent is highly recommended as effective and easy to use for control of bleeding, tissue management, and pulpotomies. Able to decrease costly impression remakes, Astringedent is well suited for a variety of dental and oral surgery procedures to arrest surface capillary bleeding. Such procedures include fixed prosthodontics, restorative-operative, periodontal treatment, etc.

Astringedent is also recommended for retrofillings, canine impactions, gingivectomies, and as a “fixative” for pulpotomies. It can be used to prevent leakage caused by sulcular fluid contamination during direct bonding procedures. Soak an Ultrapak cord in hemostatic and isolate the tissues. Follow with a firm air/water spray.

Ultradent’s Metal Dento-Infusor Tip places hemostatic agents precisely, and effectively removes superficial coagulum. Featuring a 19 ga (Ø 1.06 mm) tip, its blunt, bent cannula with padded brush enables gentle pressure on the sulcus. The Metal Dento-Infusor Tip is designed for a number of agents including Astringedent, Astringedent X, ViscoStat, ViscoStat Wintermint, and ViscoStat Clear.

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