Crows superior to dental fillings

By DTI

DUNDEE, UK: The Cochrane Oral Health Group in Manchester has recently updated one of its reviews, finding any kind of performed crown to be superior to fillings in the treatment of severely decayed primary molars and primary molars that have undergone pulp treatment. The results also suggest that out of all fitting methods, the Hall technique causes the least discomfort and problems for patients.

Named after its inventor, a Scottish dentist, the Hall technique uses a preformed metal crown that is fitted over the tooth with no local anaesthetic, carious tissue removal or tooth preparation. First introduced a decade ago, it was originally developed as a non-invasive treatment for decayed primary molars.

While the review found no evidence of the superiority of one crown type to another, the results showed that teeth restored with preformed crowns compared with fillings are less likely to develop problems or cause pain over time.

"Crowns are recommended for restoring primary molars that have had a pulp treatment, as they are decayed or are badly broken down. However, few dental practitioners use them in clinical practice," the researchers said in the report.

With the review, the researchers originally sought to determine whether the clinical outcome of primary teeth restored with preformed crowns or with fillings was in any way related to the extent of their decay.

The review updates a previous version on the subject, originally published by the group in 2007.

Dental laser market grows steadily

By DTI

CHARING, UK: In addition to oral surgery, dental lasers are used for a variety of applications, ranging from caries diagnosis to periodontitis treatment and teeth whitening. Owing to the increasing demand in this sector, among other influences, the worldwide market for the devices will grow by a compound annual growth rate of 5.2 per cent over the next five years and is expected to exceed US$200 million ($144 million) by 2020, a new report has predicted.

According to the report, this growth will primarily be driven by the Asia Pacific market as clinicians and patients in this region are increasingly becoming aware of the benefits of laser devices.

Other developments contributing to the growth of laser use, include the rise in the number of aesthetic procedures on the continent and the ageing population.

The report, which was conducted by market research provider MarketsandMarkets and published by ReportBuyer in Charing, Kent last week, analysed industry trends and the market shares of top players in the field, such as Biolase, Sirona and Ivoclar Vivadent.

It also provides insights into the markets for dental lasers across various regions, exploring new distribution channels, new client bases and different pricing policies.

"The report will enrich both established and new entrants/smaller firms to analyse the market, which in turn will help these firms achieve greater market share," the authors stated.

Owing to technical advances and high adoption rates, North America is currently leading the world market for dental laser technology, particularly soft tissue lasers.
Oral health and diabetes discussed at premier event in Singapore

By DTI

SINGAPORE: Among developed nations, Singapore has the second-highest proportion of diabetes, according to a recent report by the International Diabetes Federation. As the condition continues to be increasingly sedentary lifestyle and high-calorie diets of Singaporeans, the city-state was the ideal place for the Joslin-Diabetes Education Initiative (JDEI) to hold its first Diabetes, Oral Health and Nutrition symposium in Asia.

The one-day event took place last month at the Swissotel “The Stamford”. Attended by Singapore Chief Dental Officer Patrick Yeo and Japanese Ambassador Haruhisa Takeuchi as part of the 550 celebrations (a number of events to commemorate 50 years of diplomatic ties between Singapore and Japan), it provided the latest information on the two-way relationship between diabetes and oral health.

Over 300 international leading medical and dental health care global experts, including Dr George King, Senior Vice-President, Chief Scientific Officer and Director of Research at the Joslin Diabetes Center in Boston in the US, among others, presented the latest findings on the interrelationships, innovations and interactions between periodontitis and diabetes.

Future strategies on oral and systemic health, as well as how JDEI’s efforts at strengthening the ties between the medical and dental fields were also discussed.

According to the initiative, increasing evidence supports the existence of an association between periodontal disease and diabetes. The latest research has shown that not only are people with diabetes more susceptible to serious periodontal disease, but the condition may also have the potential to affect blood glucose control and contribute to the progression of diabetes.

Recognising that early and proper treatment of periodontal disease can have a profound effect on the control of diabetes and its complications, the Sunstar Foundation established the JDEI in April 2008 with the Joslin Diabetes Center, the world’s largest diabetes research and clinical care organisation dedicated to the prevention, treatment and cure of diabetes, affiliated with the Harvard Medical School, to engage in education and research to improve knowledge and practices in this field.

In addition to its symposium in Asia, it has organised an annual event under the same name in Europe.

Established almost 40 years ago, the Sunstar Foundation for Oral Health Promotion has achieved international recognition for the significant benefits to society gained through its efforts to improve oral care and promote dental health through various activities.

Only half of New Zealand adults visit dentist

By DTI

WELLINGTON, New Zealand: The Ministry of Health has presented the latest findings from the New Zealand Health Survey. The report found that only 48 per cent of all adults with natural teeth visited a dental professional in the past 12 months. In addition, it shows that the majority of adults living in deprived areas only visit a dental professional for problems.

While there is a limited range of publicly funded oral health services available, most adults in New Zealand are required to pay for the full cost of their dental treatment, as access to free basic dental services is only free of charge until the age of 18. Therefore, 62 per cent of adults aged 18 to 24 reported having visited a dental professional only for dental problems. Over half of adults (54 per cent) reported never having visited a dentist.

According to the report, access to oral health care varies within different regions of the country. Only 37 per cent of adults living in the most socio-economically deprived areas had visited a dental health care worker in the past 12 months, compared with 59 per cent of adults in the least deprived areas.

Overall, 8 per cent of adults had had one or more teeth removed in the past 12 months. The number of tooth extractions was highest among Maori and Pacific adults living in the most deprived neighbourhoods.
Roots Summit 2016
Premier global forum for endodontics takes place in Dubai

By DTI

DUBAI, UAE: This year’s ROOTS SUMMIT, which has drawn dental professionals to various locations all over the world in the past decade, will take place from Nov. 30 to Dec. 3 at the Crowne Plaza Dubai hotel in the United Arab Emirates.

Aimed at updating participants about the latest in endodontic treatment, an unparalleled series of lectures and workshops will be held by global opinion leaders in the field.

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

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

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

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

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

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

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

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The role of the hygienist in the 21st century

By Victoria Wilson, UAE

Since the recent launch of the Emirates Dental Hygienists’ Club in the UAE, it could not be a more appropriate time to discuss the growing role of the hygienist in the twenty-first century. The prevalence of preventable dental disease within the region prevails, and the need for a focus on the core strategy to overcome such disease needs to be addressed.

The dental hygiene profession was founded over 100 years ago by Alfred Fones in the US for the promotion of oral health and prevention of disease. The fundamental ethical responsibility of the dental hygienist is the pursuit of the promotion and restoration of oral health. The dentist’s role certainly encompasses the promotion of oral health and prevention of disease in diagnosis and operative care; however, it is important to highlight that the main difference is that the scope of practice for a dentist is far greater than for a dental hygienist. This is where the significance lies in the strengths and key focus of these dental care professionals and the key role of both in overall sustainable oral health care for every patient in serving the public.

In a recent survey carried out among dental professionals in the UAE, it became evident that a very small percentage of dentists actually work with dental hygienists. It found further that a limited number of dentists are proactive about integrating hygienists into their practice model. This highlights the potential requirement to further incorporate dental hygiene into dentistry if the existing inequalities of oral disease are to be overcome. This will require an extended workforce of dental hygienists, the expansion of educational facilities and further efforts towards including dental hygienists in existing practices in both public and private health care.

Another recent survey carried out in the region asked dentists how many of their patients are healthy. Regrettably, only a very small percentage reported having patients with good oral health. This again highlights the need for the skill set of the dental hygienist in oral health promotion and prevention of disease.

According to the findings of a further survey in the region, dental hygienists felt that very little of their total skill set was being utilised. This reflects the further need to ensure current dental hygienists’ skills are being used to the maximum potential.

In a European report, it has been identified that the UK, Sweden and Switzerland are ranked as the healthiest in Europe in relation to the low prevalence of severe periodontal disease, supporting the role of the dental hygiene profession in countries where a facilitative medico-legal framework exists to allow the inclusion of dental hygiene in integrated dental care. It has also been identified that future public perception of dental care will be shaped by the holistic approach of dental care and the importance of community health. The dental profession’s ability to optimise on reducing the prevalence of preventable dental disease.

It has been advised in a recent extensive report that future public health care policies will be orientated towards recommending behavioural support and adopting the common risk factor approach for oral health promotion. Dental hygienists in public health care settings can positively affect patients by offering preventive care outreach services. Improvement in the quality of life for individuals was noted through improved health outcomes.
New dental alert system aims at improving patient safety in Europe

By DTI

STRASBOURG, France: Requiring dental regulators in countries within the European Economic Area (EEA) to inform each other once a dental professional has been prohibited or restricted from practising, the newly implemented European Alert Mechanism aims at improving transparency in European dentistry.

The new EU legislation, which came into effect on 18 January, provides that a Europe-wide alert be issued within three days of a decision to prohibit, suspend or restrict a professional’s practice—even on a temporary basis—in another EEA state.

As a minimum, national regulatory bodies, such as the General Dental Council in the UK or the National Board of Health and Welfare in Sweden, will need to include the respective professional’s name, as well as his or her date and place of birth, in order to allow other regulators to identify that individual.

Furthermore, the alert must indicate the period for which the restriction applies, including the date on which this decision was made. Although the alert must not contain any background information or justification of the restriction, concerned regulators may request further information.

“We are delighted that this system has come into effect, it gives patients much greater visibility and security when it comes to their oral health,” commented Dr Nigel Carter, OBE, Chief Executive of the British Dental Health Foundation, on the new legislation. “This will hopefully lead to an improvement in standards of dental practice Europe-wide and more public trust in dentistry.”

In this context, Carter pointed to the increasing trend of dental tourism and the potential pitfalls associated with it.

Although some countries still do not have any formal system of registration for dentists, Carter expressed his belief that “mechanisms such as this make for a much more transparent profession and greater patient protection.”

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“We will be able to treat pretty much everything in the future”

An interview with Dr Graham Gardner, UK, President of the European Aligner Society

Dr Graham Gardner

The European Aligner Society is an international organisation established in 2001 that aims to promote education and research in aligner therapy. Trained in South Africa and with 22 years of clinical experience, Dr Graham Gardner has been running his own private practice in the UK since 2008. In an interview with Dental Tribune, the EAS President shares his ideas and views about the importance of aligners in orthodontics and about the EAS, which he believes will become the society for aligner therapy.

Dental Tribune: Dr Gardner, you have been working with aligners for more than a decade now. What convinced you initially of this treatment method and what are the main advantages in your experience?

Dr Graham Gardner: From the beginning of my career in the early 1990s, a time when ceramic brackets and lingual braces became available, I was certainly aware of the fact that aesthetic appliances were going to be the future of orthodontics.

In 2001, I was fortunate to attend a certification course for Invisalign, which was truly a watershed moment in my orthodontic career because I saw the value and potential of aligner therapy for both dental professionals and patients. In my opinion, aligner therapy opened the door for a huge cohort of patients who would not have considered orthodontic treatment.

Aligner therapy has become of age and is now a genuine appliance system with which we can treat the majority of malocclusions. At the moment, however, aligner therapy is still a fairly expensive form of orthodontics. Thus, I hope that improvements in materials and 3-D printing will render manufacture and the product itself more cost-effective. For example, 3-D printers could allow individual practices to print their own aligners in the future.

Overall, with technological advancements and increasing patient acceptance, we will be able to treat pretty much everything in the future in my view.

Dental Tribune: Today, I treat over 75 per cent of patients with Invisalign in my practices. In recent years, clear aligners have become a favourable treatment alternative to fixed appliances, and the global orthodontic appliance market is expected to reach about US$9.9 billion ($6.6 billion) by 2020. In your professional opinion, how will this market develop in the near future?

Dr Graham Gardner: The advancements we are now seeing in Europe will match those in America and Asia.

When aligners were first introduced to the market, there were some limitations and we could only treat mild malocclusions. However, aligner therapy has become of age and is now a genuine appliance system with which we can treat the majority of malocclusions. At the moment, however, aligner therapy is still a fairly expensive form of orthodontics. Thus, I hope that improvements in materials and 3-D printing will render manufacture and the product itself more cost-effective. For example, 3-D printers could allow individual practices to print their own aligners in the future.

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How have developments in the European and the overseas market differed?

Dentistry as a profession is very conservative and dentists in the US, for example, are perhaps a bit more progressive. However, with regard to aligners, I no longer really see a great difference between Europe and America. The movement is global and I suspect the advancements we are now seeing in Europe will match those in America and Asia, where aligner therapy is also very popular. There are always regional differences, also partly related to legal restrictions, but the trend towards aligner therapy is a global phenomenon.

Dental Tribune: The advancements we are now seeing in Europe will match those in America and Asia ...

Dr Graham Gardner: How does the EAS address the current trends in orthodontics?

Aligner therapy has seen huge advancements over the past decade, with an increasing number of manufacturers offering different systems today. The main motivation behind the foundation of the EAS was to establish a neutral body—an international society that is independent of any aligner company and open to all dentists using aligners for orthodontic treatment.

The work of the EAS is characterised by three cornerstones. The first is education, namely arranging conferences and regional meetings and introducing clinical online forums, through which members can interact and share experiences and ideas. The second column of the EAS’s philosophy is communication. We aim to be a neutral organisation that patients can turn to for comprehensive information about aligner therapy and that members can consult for guidelines. Research is our third column, which is currently lagging behind. Eventually, we hope to have our own aligner journal or magazine and grant annual awards for excellence in aligner therapy.

With the help of our sponsors, the EAS will grow and become an international umbrella organisation to help promote education and research and development for aligner therapy.

Dental Tribune: The EAS is a fairly young organisation and hosted its first congress on 13 and 14 February in Vienna. What was the idea behind this event?

Dr Graham Gardner: The EAS’s primary objective is education because, obviously, education underpins every profession and without it we simply stagnate. Therefore, we decided that our first event should be a congress held in the heart of Europe offering a broad spectrum of informative lectures and a showcase of different systems and products. At the first congress in Vienna, internationally distinguished speakers shared their views and expertise about aligner therapy. Moreover, the event offered manufacturers an independent forum for exhibiting their solutions.

Can dental professionals look forward to another EAS congress next year?

Based on the success of the inaugural event over the past weekend, we definitely want the congress to become a regular event in the calendar. While we are planning to hold the EAS congress every two years, we will be organising smaller regional forums on a continuous basis throughout every year.

Thank you very much for the interview.
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American Dental Association seeks exemption for dental offices

By DTI

WASHINGTON, USA: In 2015, the Environmental Protection Agency (EPA) proposed a set of regulations for the management of hazardous waste pharmaceuticals by health care facilities, in order to strengthen environmental protection while reducing regulatory burden on businesses. The rules proposed by EPA aim to streamline the current regulations governing such waste and to reduce the amount of pharmaceuticals entering waterways. The American Dental Association (ADA) has now urged the agency to exempt dental care facilities from the rules.

According to EPA, more than 6,400 tons of hazardous waste pharmaceuticals enter waterways annually through health care facilities. Hazardous waste generated by dental offices includes photographic processing waste, chemical sterilant waste, and amalgam waste.

Although the ADA has praised the agency’s concern for safe disposal of hazardous waste, the association stated that dental offices generate very little hazardous waste and even lower quantities of hazardous waste pharmaceuticals.

“In the ADA’s view, the Proposed Management Standards For Hazardous Waste Pharmaceuticals rule fails to take into account the specific factual circumstances facing (and resource limitations applicable to) the dental community. As a result, the costs exceed the benefit and EPA seeks to impose requirements that exceed EPA’s legal authority,” the ADA wrote.

In addition, the ADA has asked that EPA exempt dental amalgam from the definition of pharmaceuticals. “The ADA believes that it is not EPA’s intention to include dental amalgam within the definition of pharmaceuticals in the proposed rule,” wrote the ADA. “Dental amalgam has not traditionally been considered a pharmaceutical. Neither the rule, the preamble nor other documents in the administrative record express an explicit intention to cover dental amalgam,” the association stated.

Moreover, the ADA has called upon EPA to work with the association to develop voluntary options or guidance for dentists regarding the disposal of pharmaceutical waste.
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New nanotechnology might improve bone restoration in dental patients

By DTI

ANN ARBOR, Mich., USA: A new technology developed by researchers at the University of Michigan could help dentists improve treatment of patients with bone loss. The scientists have developed a polymer sphere that delivers a specific molecule to bone wounds that tells cells already at the injury site to repair the damage. Therefore, the nanotechnology could improve implant treatment or help patients with periodontal disease.

MicroRNA, a small noncoding RNA molecule found in plants, animals and some viruses, has shown promise in clinical research as a therapeutic agent for various diseases, such as cancer and inflammatory diseases. It might also be able to enhance bone regeneration, the current study has found.

When delivered into endogenous stem cells, the microRNA instructs the cells to switch on their healing and bone-building mechanisms, explained Dr. Peter Ma, Professor of Dentistry and lead researcher on the project. It is typically very difficult for microRNA to breach the cell wall, Ma said. However, the polymer sphere developed by Ma and his colleagues enables the RNA molecule to easily enter the cell and encourage bone repair.

The advantage of this new technology is that it uses existing cells to repair wounds and therefore reduces the need to introduce foreign cells, which is a very difficult therapy and can result in the host rejecting the foreign cells or the development of tumors.

Bone repair is especially challenging in patients with healing problems. Millions of patients worldwide suffer from bone loss and associated functional problems, boosting the possibility of dealing with other challenging human diseases, “Ma explained. There are several possible applications in dentistry and maxillofacial surgery. Moreover, it could help patients with osteoporosis, as well as those undergoing bone surgery or joint repair.

“For patients with low bone quality, it’s often hard to utilize implants to restore dental functions. This technology can potentially regenerate bone in patients with poor healing capacity, enabling implantation,” Ma told Dental Tribune.

The new technology we have been working on opens doors for new therapies using DNA and RNA in regenerative medicine and boosts the possibility of dealing with other challenging human diseases,” Ma explained. There are several possible applications in dentistry and maxillofacial surgery. Moreover, it could help patients with osteoporosis, as well as those undergoing bone surgery or joint repair.

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–Keith Henderson, D.D.S.
Traditionally, dentists have been taught that both dental caries and periodontal disease develop and progress as a direct result of patients’ over-frequent consumption of refined sugars and patients’ failure to remove bacterial plaque effectively. Miller’s aetiological theory of caries development and the non-specific plaque hypothesis based on Lee’s work in the 1960s allow dentists to present a simple cause-and-effect explanation to patients.

Since then, the dental profession has blamed patients’ poor oral hygiene for periodontal breakdown and dental caries while often failing to diagnose and treat other contributing causative factors. Unfortunately, while plaque is generally a necessary component of common dental diseases, the explanation contained in these theories of its pivotal role is simplistic given current knowledge. This brief article will attempt to put the more significant risk factors in context.

Plaque
Gingivitis is a natural bodily response to bacterial accumulation and as such is non-specific. Effective plaque removal will generally reverse gingivitis. The concept of inevitable progression from gingivitis to destructive periodontitis if oral hygiene is not good is, however, flawed. Figure 1 shows a 46-year-old patient with non-existent oral hygiene over several years. Figure 2 shows the same patient one month later after around 90 minutes of scaling and polishing by a student dental hygienist. He had no active caries and no more than ten per cent bone loss.

It has become increasingly evident that while some patients are “susceptible” to periodontal breakdown, others are more “resistant”. Common among these host-based factors leading to greater breakdown are the presence of diabetes and a smoking habit.

Diabetes
Several authors have demonstrated a clear relationship between degree of hyperglycaemia and severity of periodontitis, and the risk of cardio-renal mortality (including diabetes and disease and diabetic nephropathy) combined is three times higher in diabetics with severe periodontitis than in diabetics without severe periodontitis.1 Laved et al. showed that scaling and root planing in prediabetics reduced glycated haemoglobin (HbA1c) by 1 per cent at three months.2 Reductions in HbA1c of 0.5 to 1 per cent have been confirmed in several other studies in both Type 1 and Type 2 diabetics. There are estimated to be 335,000 diabetics in the United Arab Emirates. In 304,000 of those cases, the condition has not been diagnosed, and 934,000 people have impaired glucose tolerance, a prediabetic state of hyperglycaemia, or elevated levels of blood sugar.3

In the UK Prospective Diabetes Study, it was shown that Type 2 diabetes who reduce their HbA1c level by 1 per cent are 19 per cent less likely to suffer teeth owing to periodontal disease, whereas a patient with poor plaque control is 60 per cent more likely than a patient with good plaque control to have the risk of progressing to destructive periodontitis. Why then do we refer to gingivitis as the phase of periodontal disease? Why then do we refer to plaque as the phase of periodontal disease? Whether obesity is in fact an independent risk factor or is associated with the established role of diabetes. Regardless, obesity is a known risk factor for Type 2 diabetes and cardiovascular problems, and it is part of the dental profession’s role to inform patients of these interrelationships.

Recent research in England has suggested that 1.4 million obese patients would benefit from gastric band or bypass (bariatric) surgery. Currently, around 8,000 people a year receive the treatment on the National Health Service (NHS). If all 1.4 million were offered surgery the researchers estimate it would avert nearly 5,000 heart attacks and 40,000 cases of Type 2 diabetes over four years.

They don’t, however, discuss potential costs of this surgery, which can vary from £3,000 to £11,505 according to NHS England. Assuming £5,000 per procedure, this would total around an additional £7 billion in health costs. Nor is there much discussion on death rates (0.5 to 1 per cent with the present skill level of surgeons). Even if surgical skills do not diminish, we should anticipate between 7,000 and 14,000 additional deaths. It is likely that comprehensive periodontal treatment of all obese/prediabetic patients would be significantly less costly and, hopefully, result in few if any fatalities.

Conclusion
It is clear that the simple story of plaque control preventing progression of common dental diseases is largely fiction rather than evidence-based fact. While effective oral hygiene will always be a significant part of the management of dental diseases, the modern dental professional must be equally aware of the other common risk factors outlined in this article.

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**Crawford Bain, a UK-certified specialist in periodontics, prosthodontics and restorative dentistry, is currently Professor of Periodontology and Director of Post-Graduate Periodontology at the Hamdan bin Mohammed College of Dental Medicine in Dubai in the United Arab Emirates. He can be contacted at crawford.bain@bmcdm.ac.ae."
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Thermoplastic materials in dental technology

By Claudia Herrmann, Germany

Thermoplastic materials have been used in aviation and space engineering for a long time. Owing to their high mechanical strength and low modulus of elasticity, they have begun to increasingly replace metal in many manufacturing industries too, particularly in those where metal has been the dominant choice until now. Implants for intervertebral discs, as well as hip and knee joints, are made of PEEK, a thermoplastic polymer. Four million implants have been fitted during the last 15 years with outstanding success. In recent years, thermoplastic materials have also been used in dental technology. This article discusses a number of common plastic materials that have become alternatives for use in the manufacture of non-metal telescopic dentures.

About 15 years ago, the first attempts were made, not without initial problems, to produce non-metal telescopic dentures. These dentures were made by injection moulding using a polyamide (PA) in the dental laboratory. A wax mould of the framework, bar and secondary crowns is made as an integral part, embedded in plaster in a flask and the wax boiled out. The plastic material, which is available in the laboratory as granular material, is heated in the injection moulding device and injected into the mould. After a period of cooling, which should not be shorter than specified, the prosthesis is removed from the mould and finished. Special milling cutters are needed because the material tends to become viscid when cut. Very importantly, absolutely no metal must be entrained if the denture were to cut by a tool previously used for cutting metal, minute metal particles would be incorporated into the thermoplastic material by the milling cutter. Friction would easily be controlled by expansion plaster.

The good sliding properties and the high friction of the secondary crown particularly surprised us. When inserted, the secondary crown slides along the primary crown and is retained partly by clamping and partly by suction. Our patients found the good sliding properties and the light weight comfortable. The modulus of elasticity of PA is very low, which lends flexibility to the material. This gives the patient a sensation of a readily adapting denture, rather than a foreign body, in his or her mouth (Figs. 1–3).

The low modulus of elasticity, however, turned out to be the greatest drawback of the material. The modulus of elasticity of all plastic materials used for bonding are very high and two moduli as wide apart as these cannot be bonded reliably for a long time by any means available to dental laboratory technicians. As a consequence, many dentures develop cracks and spalls in the bonds after several months. In addition, the large pores on the surface of the denture led to discoloration, particularly in patients with an altered acid–base balance.

Unfortunately, denture breaks were reported after some time, particularly in free-end situations. Also, dentures not lined regularly and exposed to high force tended to break. We believe one reason for this is the fairly high modulus of elasticity, which makes the material somewhat brittle. The greatest problem, however, is that thermoplastic materials cannot be repaired. There is no way of repairing cracks or fractures. The only solution is to make a new denture.

PEEK

PEEK (Polyetheretherketone) was first used for telescopic dentures about six years ago. In general medicine, it has been used for hip, knee and intervertebral disc implants for almost 15 years. According to German company Evonik Industries, as many as four million implants have been fitted and not a single case of proven allergy to that material has been reported. The modulus of elasticity of PEEK is similar to that of bone, with positive consequences for integration. This is one of the reasons that PEEK merits the attention of dental laboratory technicians. Finally, there is a material with a hardness similar to that of bone, not as soft as PA or FPM plastics and not as hard as PMMA. These very rigid materials often cause dental technicians problems, for example with all-ceramic solutions for the upper jaw, where craniomandibular problems frequently arise.

PEEK is a very lightweight material with a long history of use in space flight. Non-conductive, it has
been used in semiconductor technology for a long time. This property also offers benefits for use in the oral cavity.

The pharmaceutical industry uses PEEK in production. Parts in contact with the product are made of PEEK owing to its low discoul- 
ration and high resistance to wear and corrosion. Both properties are also very useful for dental technology.

PEEK is indicated for removable, as well as conditionally removable, prostheses. Therefore, bridges, crowns, telescopic dentures and attachments, as well as screw-retained superstructures, can be fabricated. The material has very good sliding properties and patients report that it is extremely comfortable to wear.

There are two different methods of manufacture. One is injection moulding and the other is CAD/CAM milling. The minimum thickness of telescopes is 0.6 mm. The minimum thickness of frame-works and bars is distinctly higher, but varies depending on the design and the size of the telescopic prosthesis, as well as the number of available telescopes. Generally, a PEEK telescopic prosthesis will be a little thicker than a metal tele-
scopic prosthesis. It is an absolute necessity that the primary crown be made of zirconia, as abraded metal particles would otherwise collect under the secondary crown.

The veneer bond strength was tested in a study at the University of Regensburg, Germany, in 2012. In order to pass the test, a value of 5 MPa had to be achieved. Of all the veneering systems tested, PEEK scored 10 MPa and above and passed all of the bond strength tests. In other tests, such as discoul-
oration and shear strength, it also achieved very positive results, con-
firming the suitability of PEEK for use in the oral cavity. When sub-
jected to load at fracture tests, a PEEK bridge achieved 2,354 N and was far superior to a ceramic bridge, with 1,702 N. Hence, PEEK can withstand higher loads in the oral cavity than can ceramic material, and so wide-span telescopic dentures can be made of PEEK.

It is necessary when handling telescopic dentures of PEEK to apply ceramic guidelines because the material could otherwise be weakened owing to crack propa-
gation. In addition, the prosthetic design must follow certain criteria. For example, a prosthesis without a transverse bar must always include a backing plate in the secondary part to provide sufficient stability. Dental technicians required to make non-metal telescopic pros-
theses should therefore receive sufficient training and instruction so that the required high-quality level can be maintained. Those who work with PEEK only rarely and who therefore lack experience are ad-
vised to have telescopic prostheses of PEEK designed and cut in a spe-
cialised laboratory. Even in our laboratory, we have come across PEEK prostheses with cracks, but these have invariably been due to manufacturing mistakes. Prosthe-
ses made correctly exhibit no cracks. Cracks and spalls of the veneering of PEEK dentures can be found about as often as in tele-
scopic prostheses of metal—that is, rather seldom.

PEEK is extremely resistant to plaque and inert to acids and chem-
icals; therefore, the denture can be cleaned with a chemical dental cleaner.

Friction is one of the most critical characteristics of telescopic pros-
theses. The friction of PEEK is very good and can be controlled ex-
cellently with expansion plaster. However, most important is that friction is permanent. We made our first telescopic prostheses of PEEK about five years ago and we have not observed any loss of friction in that time (Figs. 7–13).

Conclusion
Our laboratory has the experi-
ence of having made over 300 non-
metal telescopic prostheses over the course of 12 years. After initial problems and several tests, PEEK has finally proven a suitable mate-
rial for telescopic dentures in the long term. Non-metal telescopic prostheses are in no way inferior to metal telescopic dentures, pro-
vided they are made profession-
ally. On the contrary, the light weight, the high wear comfort and the absence of metal, in particular, are compelling arguments for den-
tal technicians and patients alike.

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“This conference is yet another layer in MIS’s vision”

An interview with Marketing and Branding Manager at MIS, Galit Gerstel

For the third time, MIS Implants Technologies will be holding its global conference, from 28 to 29 May in Barcelona in Spain. In anticipation of the event, Dental Tribune had the opportunity to speak with Galit Gerstel, Marketing and Branding Manager at MIS, about what attendees can expect and the latest developments in dental implantology.

Dental Tribune: The second global conference in Cannes in 2015 was attended by over 2,000 participants and was thus considered a great success. What is the current outlook for 2016?

Galit Gerstel: The third MIS Implants Global Conference will continue its excellent scientific program. Combined with exciting social events, it will be a great opportunity for participants to expand their professional knowledge and social network.

The conference will be held under the theme of “360° IMPLANTOLOGY”, which is reflected in the new VCONCEPT. Could you please explain why such a holistic approach is important in planning and placing dental implants?

The novel VCONCEPT by MIS offers dentists in all clinical disciplines a simple solution easily achieved using routine protocols, yet with a greater biological advantage: more bone where it matters most. The VCONCEPT stands for a greater volume of soft and hard tissue, vascularity and vitality of both existing and newly formed bone. The innovative V9 implant features a triangular neck, allowing new bone formation and significantly reduced crestal bone compression combined with high primary stability, without compromising the implant diameter. State-of-the-art tools and a comprehensive range of prosthetic options, with a gold shade and consistent concave emergence profile, enhance the excellent surgical results by allowing ultimate soft-tissue management and exceptional treatment outcomes.

What will the 34 lectures and six workshops focus on?

The lectures and sessions will cover a wide range of topics by world-class experts and opinion leaders. The varied programme is divided into three main themes:

- The first day will include a young clinician session, as well as master sessions, focusing on challenging situations in implantology, and various hands-on workshops.
- The second day will cover different aspects of the VCONCEPT, from the clinical to the restorative, and will introduce different solutions for various clinical scenarios using the V9 Implant System.
- The third day will mainly address digital dentistry and will present clinical controversies in contemporary implant dentistry.

With a dedicated Young Clinician Session, the conference also provides a platform for young clinicians to present clinical cases and techniques. In your opinion, do young dental professionals have a different approach to challenging situations in implantology compared with older generations?

The younger generation of dentists is very interested in new technologies and approaches and is an early adapter of both current protocols and innovative capabilities, which is ideal for a dynamic company like MIS.

With this conference, MIS is giving young clinicians an opportunity for exposure by presenting their cases and learning from more experienced clinicians.

The number of implants placed worldwide is expected to double over the next five to six years. Consequently, education efforts have to double too in order to ensure that dentists are adequately trained in implant placement. How can MIS and the global conference in particular contribute to this?

MIS strongly believes that integrating implantology skills into dental practices is a necessity and that investments in implant training ensure continued long-term rewards for both doctors and their patients. To fill the gap between theory and practice, and further develop clinicians’ skills, MIS has established the MIS Training Centre, offering international implantology courses that allow general dentists, periodontists, prosthodontists and oral surgeons to gain proficiency in implant dentistry in the company of their peers from around the world. The global conference is yet another layer in...
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Together towards pink–white aesthetics

Communication is the foundation for natural-looking results

By Dr Jorge André Cardoso, Dr Rui Negrão, Dr Teresa Taveira & Oleg Blashkiv, Portugal

In the field of prosthetic dentistry, effective communication between the clinician and dental technician is of utmost importance. Consistent close cooperation between the dentist and the dental technician and their concerted action provide the basis for a successful outcome. This article demonstrates the importance of good cooperation in a case that involved soft-tissue remodelling in the anterior region, among other things.

A 32-year-old female patient presented to our practice with an unsightly, defective anterior bridge extending from tooth #12 to tooth #21. The bridge had been placed seven years previously but the patient was unsatisfied with her smile and was seeking an aesthetic, more natural-looking alternative. The veneer of the metal–ceramic bridge had a very opaque and yellowish appearance.

At tooth #21, the metal margin was exposed cervically owing to gingival recession. Alveolar ridge atrophy in the area of the missing right central incisor (pontic) had resulted in considerable vertical reduction. The shape and shade of the teeth needed improvement, and harmony between the white and pink tissues had to be restored (Fig. 1).

Treatment plan and mock-up

Smile improvements often involve complex procedures; therefore, it is advisable to simulate the final result by means of a direct composite mock-up. This important step boosts the patient’s trust and confidence. A mock-up provides the patient with a clear idea of what the effect of the planned restoration will be once it has been seated in the mouth.

In our opinion, this step cannot be entirely replaced by digital design previews. Furthermore, the mock-up allows the laboratory technician to obtain a better understanding of the individual clinical situation. Later, it can be used as a template in the fabrication of the laboratory wax-up and/or the provisional restoration.

In our case, the mock-up revealed that in order to achieve a more balanced appearance, tooth #22 had to be integrated into the restoration (Fig. 2). Even more important, it showed that not only the correct position, shape and colour of the teeth, but also the correct gingival architecture and emergence profiles were key factors in achieving a harmonious smile in this case. Consequently, the patient was informed that the soft-tissue volume would have to be increased in the pontic area in order to achieve a satisfactory result. The patient fully agreed to the treatment plan suggested.

Overall, the treatment plan involved the removal of the existing restoration, the placement of a provisional bridge and soft-tissue grafting in the pontic area (soft-tissue management that would take several months), as well as the insertion of a new ceramic bridge and a laminate veneer on teeth #22 and #13, if needed.

Connective tissue graft and immediate provisional bridge

Frequently, tooth extraction is considered a possible cause of alveolar ridge atrophy. In this particular case, there was a considerable lack of volume due to bone loss in the pontic area. For the purpose of re-establishing the soft-tissue architecture, two surgical interventions were planned. Immediately after the first connective tissue graft had been performed, a laboratory-fabricated provisional bridge was placed. The bridge was constructed on the basis of the mock-up information and reinforced with metal wire.

The soft-tissue contouring phase that followed took several months. Initially, the provisional exhibited an inner concave surface to provide sufficient space for the soft tissue. It has been suggested that a provisional pontic should have a convex final shape. However, having a concave initial shape allows for progressive tissue modelling from the palatal to the buccal side, which is helpful especially when several grafts are needed (Figs. 3a–6d).

Communication of emergence profiles and shapes to the laboratory

Once the desired soft-tissue shape had been achieved, one of the great challenges was to transmit all of the relevant information, especially the length of the inter-incisal papilla and the pontic shape, to the laboratory. This is important because when the impression is made, the pressure of the impression material may deform the soft tissue. In order to prevent any possible loss of information, the pontic area of the provisional restoration was filled with a silicone-based impression material and then placed over the prepared teeth on
the model (Figs. 7–8b). This would provide the technician with a good approximation of the final shape of the pontic. In order to determine the correct location of the contact point, the distance between the bone crest and the gingival crest was measured.

It is well established in the literature that a papilla will be present if the contact point is no more than 6.5 mm away from the most coronal interproximal height of the bone crest between a natural tooth and a pontic. This can be measured by probing the bone with an endodontic spreader, marking the distance during the fabrication of the restoration.

However, using this distance can lead to a very large contact area with a short papilla if the bone is missing. The result is an unnatural, square tooth shape. Hence, this is important information for the technician. When applied wisely during ceramic layering, interproximal pink, brown and yellow stains can create a very natural illusion and thus help to overcome this problem. In the course of the treatment in this case, it became clear that the restoration of tooth #13 was unnecessary during ceramic layering for the technician. When applying the endodontic spreader, marking the distance during the ceramic try-in and then using it in the fabrication of the restoration.

The try-in of the restoration showed that the zeniths of the gingival contours were misplaced. The use of slide sharing software allowed us to transmit visual information to the dental technician regarding the issues of the desired gingival zenith, interproximal stains (to mask the interproximal spaces) and the position of the buccal ridges, which is of paramount importance for the visual perception (Fig. 9).

Final restorations

Even though cementing the veneers first has certain advantages (colour stabilisation), in this particular case, both types of restorations were cemented simultaneously. The veneers for tooth #22 was pressed from IPS e.max Press lithium disilicate glass-ceramic (LT ingot in Shade A2; Ivoclar Vivadent) and completed with IPS e.max Ceram (Ivoclar Vivadent). The pressable ceramic is available in various degrees of opacity and enables aesthetic restorations to be fabricated that blend seamlessly with the remaining den- cision. Variolink Esthetic LC (in a neutral shade; Ivoclar Vivadent), a light-curing luting composite, was used to cement the laminate veneers (Figs. 10–13).

Conclusion

Smile improvements are very challenging, particularly if harmonisation of the gingival archi- tecture, in addition to restoring the white aesthetics, is required. Only by choosing a multidisci- plinary treatment approach will mutually beneficial communi- cation between the dentist and dental technician take place. This is a prerequisite for achieving success.