Dental Tribune

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Dr. Raghad Scoops Another Award

Assistant Professor and the Head of Growth and Development department in the college of Dentistry, Ajman University of Science and Technology, Dr. Raghad Hashim, added another milestone to her logbook of achievements by winning the first prize of His Highness Sheikh Rashid Bin Humaid Scientific Award for the Distinguished Medical Research in the GCC. Her research focused on dental trauma management among young children in the Emirate of Ajman.

Dr. Raghad has confirmed that this award has imposed its cultural level of the region and buoyed with a series of valued studies and research which has worked to bridge the apparent

→ DT page 2

Dental X-rays linked to brain tumors: US study

People who get regular dental X-rays are more likely to suffer a common type of brain tumor, US researchers said on Tuesday, suggesting that yearly exams may not be best for most patients.

The study in the US journal Cancer showed people diagnosed with meningioma who reported having a yearly bitewing exam were 1.4 times to 1.9 times as likely as a healthy control group to have developed such tumors.

A bitewing exam involves an X-ray film being held in place by a tab between the teeth.

Also, people who reported getting a yearly panorex exam -- in which an X-ray is taken outside the mouth and shows all the teeth on one film -- were 2.7 to three times more likely to develop cancer, said the study.

A meningioma is a tumor that forms in the membrane around the brain or spinal cord. Most of the time these tumors are benign and slow growing, but they can lead to disability or life-threatening conditions.

The research, led by Elizabeth Claus of the Yale University School of Medicine, was based on data from 1,433 US patients who were diagnosed with the tumors between the ages of ages 20-79.

For comparison, researchers consulted data from a control group of 1,350 individuals who had similar characteristics but had not been diagnosed with a meningioma. Dental patients today are exposed to lower radiation levels than they were in the past, but the research should prompt dentists and patients to re-examine when and why dental X-rays are given, said Claus.

"The study presents an ideal opportunity in public health to increase awareness regarding the optimal use of dental X-rays, which unlike many risk factors is modifiable," she said.

The American Dental Association's guidelines call for children to get one X-ray every one to two years; teens to have one every 1.5 to three years, and adults every two to three years.

The ADA said in 2006 there was little evidence to back up the routine use of full-mouth dental X-rays in patients without any symptoms. DT

Survey finds most unattractive oral problems

RUGBY, UK: In a time when appearance has become very important, bad teeth are repulsive to many people. A survey conducted by the British Dental Health Foundation (BDHF) ahead of its annual oral health campaign, National Smile Month, demonstrated that an imperfect smile usually makes a bad impression.

The survey of more than 1,000 people aimed to determine which oral health problems are generally considered the least desirable to one's appearance.

Missing teeth was considered to be the least desirable problem by 57 per cent of respondents, and stained teeth turned off nearly one in five respondents (18 per cent).

Surprisingly, only six per cent of the respondents were most put off by braces, and only two per cent of people thought fillings were the least desirable feature.

Opinions were also sought on cracked teeth, uneven teeth and receding gums, problems that put off a combined total of roughly one in five respondents (18 per cent).

According to Dr Nigel Carter, Chief Executive of the BDHF, the findings do not come as a great surprise: "Images portrayed in the media of celebrities have led to a society where image and the way we look is an important facet of daily life. Young people particularly associate celebrities with attractiveness, achievement and affluence, so it is only natural they will seek to mimic what they see on TV and in print. … Celebrity smiles can be particularly endearing, so it is little wonder survey results indicate missing and stained teeth are the least desirable oral health issues for the way you look."

DT Page 1

shortage in the arena of intellectual, noting that the future of the award is full of hopes and great ambitions through its goals and its ongoing quest to deepen the bonds of communication between the Gulf society.

Her innovative research findings were recognized and honored internationally by receiving many awards. She also won the Association of Arab Dental Faculties Award, for the Best Published Scientific Research in Dentistry for the year 2009 from the Association of Arab Universities in Beirut, Lebanon. In 2007 she was nominated for "Gidden" Award for Distinguished Research in Behavioral Sciences after presenting her research in New Orleans, USA.

In 2005 she has received the "Colgate Research in Prevention" Award from the International Association of Dental Research presented in Washington-USA. The same year, she also received "Sultan Al-Owais" Award for Studies and Scientific Innovation, and was the first prize winner for the Best Medical Research in UAE.

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Implant failure may be related to bisphosphonate use

DTI

NEW YORK CITY, NY, USA: The results of a study conducted at the New York University College of Dentistry seem to confirm the hypothesis that the use of oral bisphosphonate is connected to dental implant failure. In the case-control study, more than 300 middle-aged female patients with failed dental implants were compared with woman from the same age group whose implants were still intact.

Clinical evaluations at the Department of Periodontology and Implant Dentistry were conducted between 1997 and late 2004. According to the researchers, the clinical data gathered from these examinations showed that in women whose implants had failed the odds of having taken bisphosphonate orally were almost three times higher. Dental implant failure related to the use of oral bisphosphonate also seemed to be more likely to occur in the maxilla.

Neither the quantity nor the duration of bisphosphonate use was evaluated.

Although the risk of implant failure is low, the researchers concluded that oral bisphosphonate could pose a risk to the success of dental implant therapy and should be prescribed with caution.

Earlier research on the association remains ambiguous, as results from Sweden and Australia have not found increased risks for implant failure when bisphosphonate was taken by patients before or after implant placement.

However, the majority of clinical organisations still recommend that long-term users stop taking bisphosphonate before undergoing dental implant procedures to avoid complications. DT

Teeth equally perceived by dentists

DTI

BERLIN, Germany: Several morphometric studies have proven sexual dimorphisms in human teeth, for example that women's teeth are smaller than men's teeth. The German Society for Sex-Specific Oral and Maxillofacial Surgery recently reported on a study that found no obvious differences between male and female teeth.

Headed by Prof. Ralf J. Radlanski from the Centre for Oral and Maxillofacial Surgery at the Benjamin Franklin Campus of Charité Universitätsmedizin Berlin, the researchers explored whether the sex of an individual could be identified if only the front teeth were considered. This was tested by having participants evaluate 50 images of the anterior oral region of men and women aged between seven and 75. The lip area was not shown.

The participants included dentists, dental technicians, dental students and dental professionals, as well as 50 people who had no professional dental background.

The results overall demonstrated that sex could be detected in only about 50 per cent of the images. Although there are anthropological studies that claim to prove measurable morphometric differences, the study proved that those are not even visible to experts' eyes.

While some tooth positions were correctly assigned by 70 per cent of the participants, others were wrongly assigned by the same number of participants. The assumption that women tend to have rounded teeth and men rather angular ones could not be confirmed by the study. Furthermore, contrary to what was expected by many of the participants, shape, size and colour of the canines were not meaningful indicators of sex.

"In everyday practice, it is relevant whether the restoration fits the patient's face but not whether the patient is male or female," Radlanski said. "Recognisable typical male teeth or female teeth do not exist." DT

Metal ceramic – well-proven and future oriented

We at Dentallabor Cera-Tech in Liestal/Switzerland, concentrate to a large extent on CAD/CAM technology and spend a lot of time advocating the cause of allceramics. Nevertheless, metal ceramic, comprises around 30% of our range of products and services, continues to remain an indispensible part of our programme. Gold accounts for 70% of this, and – trend increasing – non-precious metal alloys 30 %.

The following article presents a corresponding case example.

Customer requirement and planning

The patient's tooth 11 was fractured and tooth 21 showed severe cracks (fig. 1). The requirements of the dentist were clearly defined, and communicated by oral agreement and an order form: the crowns were to be implemented as a standard restoration in metal ceramic, and at the same time blend harmoniously with the patient's oral situation.

For this reason, we decided to have the shade determination performed in the dental practice, and instead of using the casting technique, to fabricate the crown coping by milling a CAD/CAM restoration from a non-precious metal alloy. For the veneer we chose VITA VMK Master, a new metal ceramic for veneering in the classical style, and which promises brilliant shade reproduction.

The implementation

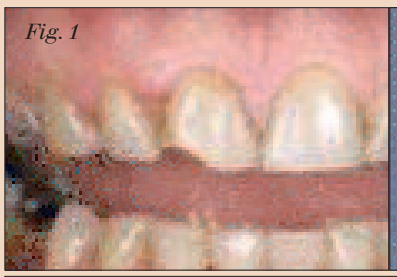
For shade determination we use – with growing enthusiasm – the VITA Linearguide 3D-Master, which is also finding increasing approval on the part of our dentist customers. We like the fact that it is based on the already known linear principle because it does not require any rethinking in terms of the concept. Also in the case described here, the dentist used this for determining the tooth shade. In addition to this, he documented the situation prior to treatment and the results of shade determination with regard to lightness and chroma by means of digital photographs which he sent us by e-mail. Further discussion of the case took place by telephone. This procedure usually enables us to achieve a remarkably high degree of accuracy, even without the dental technician having come into contact with the patient in person.

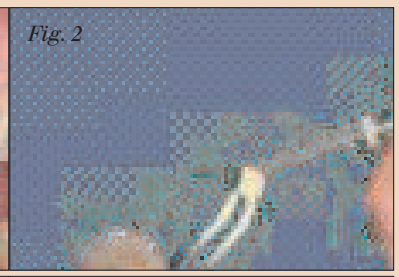
The master model was scanned and used as a basis for the virtual framework design, and the latter was milled from a non-precious metal alloy. An important prerequisite for digitisation is that the dentist must be accurate in his preparation work, so that the preparation margin can be easily read by the scanner. The risk of cavities and porosities which could endanger the veneer, and in the event of late cracks result in work covered by guarantee, is no longer given in CAD/CAM manufacture, since the non-precious metal blanks are industrially fabricated according to unified quality standards. A further advantage of the milled non-precious metal copings is their high degree of marginal accuracy. The work required in the fitting of the copings is reduced to a minimum – only the mounting pins have to be removed, and the margin finished in such a way that it tapers thinly.

We used a silver and palladium-free alloy which has high strength values that enable it to withstand a high load capacity. This offers a high-quality, and, above all, a cost-effective alternative to all-ceramic and gold content solutions.

For the opaque application we use the SPRAY ON procedure (fig. 2), so that a thin and homogeneous layer thickness is achieved, which at the same time has good covering power. The restoration was built up using the classical dentine/enamel layering known, for instance, from VITA OMEGA 900. In this way, by using an efficient layering technique, I can quickly and easily obtain an aesthetic result. I am impressed by the stability characteristics of the ceramics. This material property is an advantage especially in the case of larger restorations.

VITA VMK Master offers a comprehensive assortment for





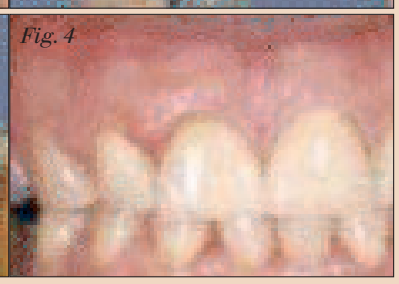


Fig. 1: Situation before treatment.
Fig. 2: Opaque application in the VITA SPRAY-ON procedure.
Fig. 3: Completing the build-up with enamel and effect porcelains.
Fig. 4: End result directly after seating the restoration.
Fig. 5: VITA VMK Master

individualisation. In this case, however, because a standard solution was requested, I kept to just a few different materials, and modelled only the mamelons. I built up the incisal edge and the approximal areas by applying ENAMEL (EN1), and OPAL TRANSLUCENT (OT1) (fig. 3). The restoration was fired at 930°C, the approximal and palatal contacts adjusted, the latter in the articulator with lateral and protrusion movements under canine guidance before the finishing of the restoration.

I am very impressed by the very low degree of shrinkage, which I will be pleased to take into account when layering in future. A generous application of porcelains at the approximal points in order to compensate for shrinkage is not necessary to this extent, as I am accustomed to doing with other ceramics. The final glaze firing achieves a shade brilliancy which awakens the tooth to life. There is a natural harmony between opalescent and translucent regions. As with every ceramic veneer, the actual success of the restoration can only be seen when the restoration is seated in the patient's mouth. Only then is it possible to assess whether the crowns – as desired by the patient – are harmoniously matched to the patient's oral situation. In our case, patient, dentist and dental technician alike were satisfied with the restoration (fig. 4).

Conclusion

Our aim is to provide an attractive solution with natural aesthetics in the VMK technique, even in cases which initially do not look very promising. If dentist and / or patient insist on a metal ceramic instead of a full ceramic highend solution, we can offer good, competitive results using our CAD/CAM system and VITA VMK Master, which is based on a combination of state-of-the-art equipment and highquality materials. Thanks to the use of a ceramic which is simple to process, pleasant to work with, and has a wide processing interval and accurate shade reproduction, which, in combination with the VITA Linearguide, enables the fabrication of crowns with natural aesthetics, time-consuming adjustments and corrections are usually unnecessary. We would appreciate a sample copy of any reprints.

VITA Zahnfabrik H. Rauter GmbH & Co. KG

Headquartered in Bad Säckingen/Germany, VITA Zahnfabrik H. Rauter GmbH & Co. KG has been developing, producing and marketing innovative solutions for dental prosthetics according to consistently high quality standards for over 85 years, and has been known from the very beginning as a pioneer and worldwide trendsetter. The VITA shade standard, for instance, is recognised internationally in the dental branch as a shade reference system. Users in 120 different countries benefit from the comprehensive range of products and services provided by VITA Zahnfabrik. These include analogue and digital tooth shade determination systems, acrylic and ceramic teeth, veneering and framework materials for conventional and computer-aided manufacturing procedures, dental equipment as well as a wide range of service and training facilities. DT

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Un-cosmetic dentistry

Are you ready to reduce your dependence on porcelain restorations?

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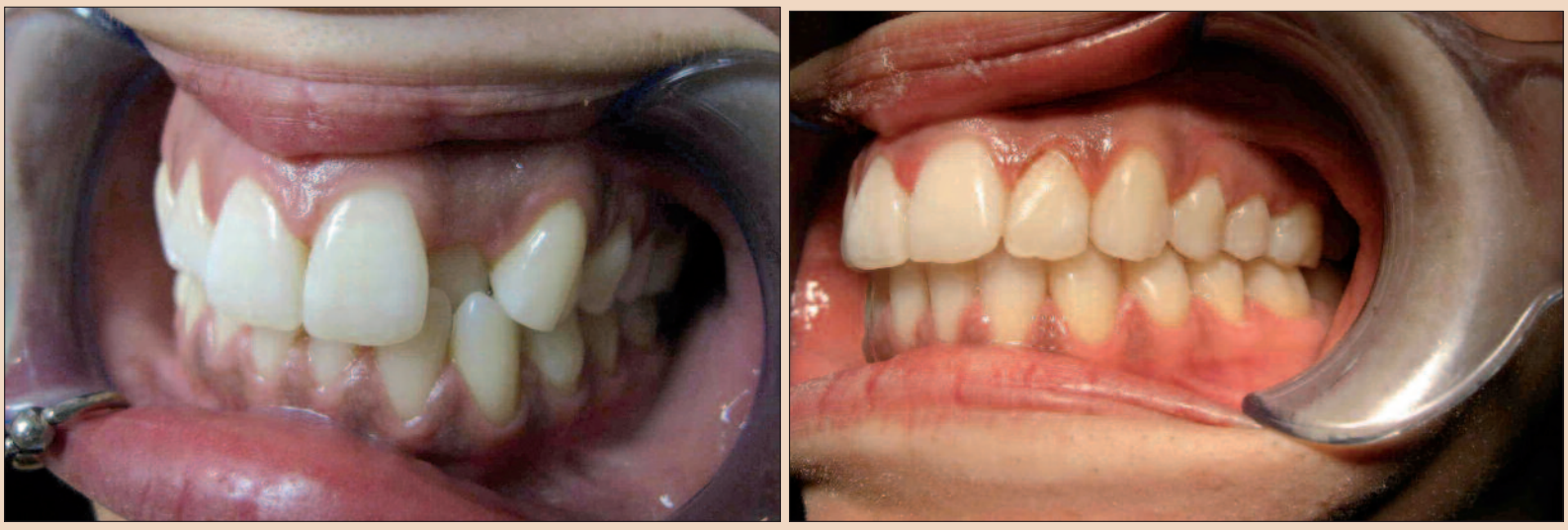
Dr Michael Zuk
Canada



Anterior alignment is completed in extremely short periods of time, as in this example the lateral incisor was proclined in only 3 1/2 months.

While there are some occasional references to concern about the overuse of porcelain, many articles in dental trade publications show off before and after dental makeovers that from my perspective were quite satisfactory prior to expensive intervention. I will not argue that there are people who truly have displeasing smiles and they can benefit greatly from cosmetic dentistry, but all too often people with body-image issues related to a distorted perception of their teeth seem to be easy victims.

"Smilorexia" is the fanciful term I coined for this disorder, which appears to affect attractive young women more than others. If you open the pages of any journal published by the American Association of Cosmetic Dentistry, you will no doubt find at least one or two of these patients having extensive veneer treatment that could easily have been avoided with unbiased professional advice. The problem is that too many dentists have dedicated their lives to pure cosmetic dentistry, which is often based on using porcelain as a cure-all.

Sadly, many of the cosmetic dentists recognised as the top tier appear to use their standing as a licence to drill. It is time to adopt a significant change in philosophy if the dental profession wishes to maintain any level of integrity. Lip service to conservative cosmetic dentistry means nothing. To truly practise "uncosmetic dentistry", a dentist must back away from ceramics and make use of composite to restore worn edges in combination with orthodontics to correct alignment.

This style of treatment does not have to be unprofitable. It does not have to be only for the simplest of cases either; actually, very complex cases can be treated to a high standard when multiple disciplines are employed together. The collaboration of specialists can be one alternative, but for patients on a budget or in areas with lower access, a general dentist trained in advanced therapies can offer comparable results for a fraction of the fee.

Biggest bang for the buck – The STO combo

Let's cut to the chase: if you are a general dentist and want to knock your practice out of the park with new opportunities, look at venturing into the realm of advanced shorter-term braces. I specifically say "shorter" because your goal needs to be always trying to be faster because people hate being in braces, and aligners are often too slow or they do not give the dentist enough control of tooth movement.

"It is time to adopt a significant change in philosophy..."

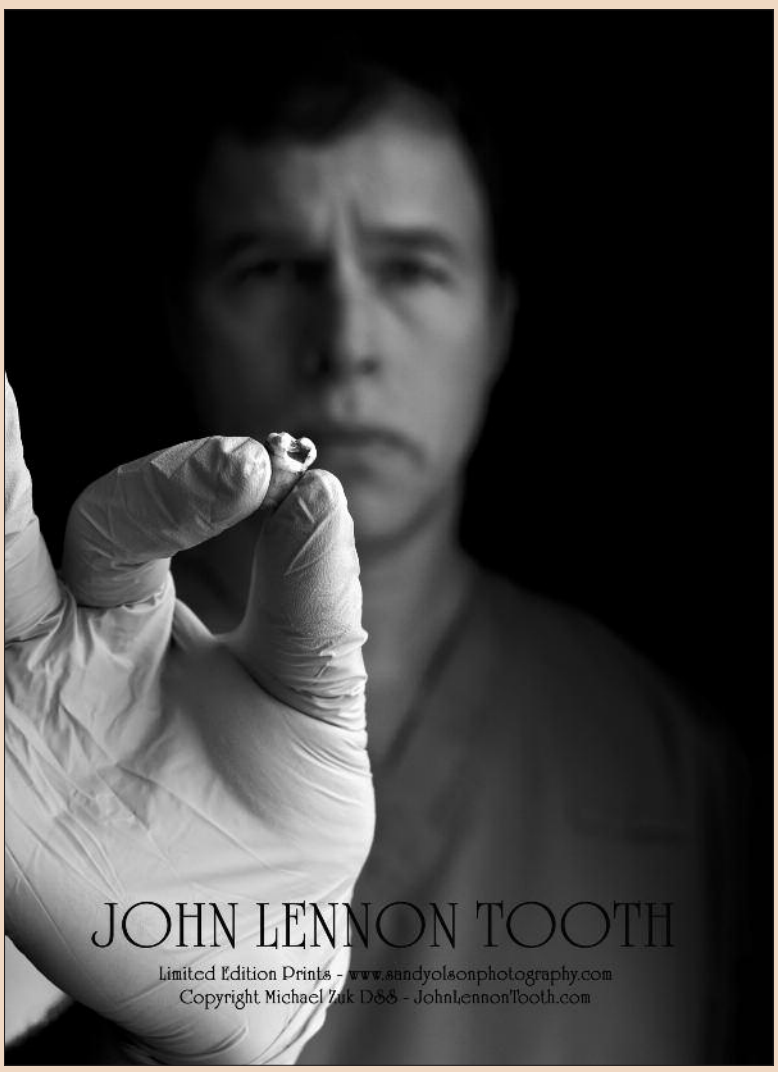
There are a number of dentists who promote STO, but I developed my own system before I had heard of any others so I have some different ideas. Frankly, levelling and aligning simple orthodontic cases is easy and can be learned through just a short course, which these dentists (Drs Swain, Barr or De Paul) appear to teach very well. I would rather remain on the fringe of even these trend-setters, and offer my twisted perspective with less corporate influence.

As hugely popular as these STO courses are, there is however some potential for abuse by dentists who simply have a weekend course and no other training in orthodontics. While I would rather see a dentist do more orthodontics than veneering, orthodontists are partially justified for their concerns about GP orthodontics.

Taking courses alongside orthodontists and reading their journals, it is apparent that there is negative sentiment directed towards general practitioners who dare to bracket teeth. I do feel that a united profession is a favourable concept but, having experienced extreme levels of sabotage in my local area, I now refer less than in the past. Some other general dentists have mentioned similar problems (on online forums) with turf protection that appears oddly focused on orthodontics.

An article recently used the term "soft science" to describe orthodontics, and I would certainly agree that it is difficult to claim that orthodontists know the "right way to straighten teeth", since few of them agree on anything. The reality is that the schools of thought in orthodontics are as polarised as the holy war between the myo-centric doctors and the centric relation believers.

As an example, the use of the Herbst appliance forces the TMJ forward, in an attempt to correct a deficient mandible. This is like someone standing on the balls of her feet to be taller. While the practice appears to be commonplace, there are orthodontists who would never use this technique on their own children or grandchildren. The studies always seem to conclude with a recommendation for long-term data, but the device has been used for 100 years already. Mandibles are not stimulated to grow after all, and patients may be holding their jaw forward in a Sunday bite simply to get their uncomfortable braces off.



Dr Zuk is also known as the crazy dentist who bought a tooth from John Lennon. (DTI/Photo courtesy of Sandra Olson, Canada)

Orthognathic surgery may be vastly underutilised in some cases and overused in others. The use of TADs appears to offer some promise, and while an oral surgeon may find it a nuisance to bother with placing them, a general dentist may be able to get them in place with little difficulty. Orthodontists often tremble at the thought of using a needle (like I did in dental school), so the price goes up as the patient heads to the oral surgeon.

BIAS: *A particular tendency or inclination, especially one that prevents unprejudiced consideration of a question; prejudice*

So this article is obviously biased towards expanded skills for the general dentist, but I do respect the need to pick your battles in treatment and refer when the case demands it. I essentially do not believe in putting up with any rubbish from specialists who want to dictate what a general dentist can and cannot do. If you do not like my ideas, tough luck because the ones you have may not stand up under close scrutiny. I do not want to waste my time justifying anything I choose to do and if I am taking a course beside an orthodontist who is snivelling that he will start doing fillings and extractions, that is awesome; I may have an opening for an associate.

As excited as I am about STO, I think a two-day course is only a taste of what you need to know. It is like taking a two-day self-defence class and then thinking you can enter mixed martial arts. The problem is not what you learn, but the cases that you attempt that are actually much more complex than you realise (you will be defeated!). You MUST take a full orthodontic course such as the one taught by Dr Richard Litt, and you are insane not to take a series of oral rehabilitation courses from Dr Frank Spear or Dr John Kois.

Adult orthodontics is full-mouth reconstruction, and the treatment of worn dentition is

too important to overlook. In fact, orthodontists have a very difficult time trying to treat adults with worn dentition, so I consider this a very good niche for doctors ready to invest in cross-training.

I have seen an orthodontist try to treat an advanced wear situation with full orthodontics, and the result was all wrong. Instead of allowing for the restorative material, the practitioner moved the short teeth into place as if they were full size, so when we wanted to lengthen the worn incisors the result was a posterior open bite. The easier way to treat the case would have been to build up the teeth with composite prior to starting the orthodontics.

"...the market is shifting towards dentists who are ready to mix up their training."

"I know, NOT ALL cosmetic dentists are Veneer Nazis, ..."

Cosmetic dentists have a tendency to veneer everything. They veneer teeth straight because they claim braces take three to four years. They veneer teeth to get rid of wrinkles and headaches. They veneer teeth to whiten and straighten them. They veneer teeth because the old veneers break. Exaggerated times in braces are often lies that need to be corrected as soon as possible to stop the abuse that is going on. Cosmetic dentists need to reprogramme to back off and get some air. And orthodontists need to give a little elbow room to their referring dentists who want to offer some orthodontics. The smart ones maintain a positive relationship and often see referrals from the primary care dentist increase. I know, NOT ALL cosmetic dentists are Veneer Nazis, and NOT ALL orthodontists tell patients that GP orthodontics causes root resorption.

My suggestion for breaking an aesthetic obsession is "cosmetic detox", which is very difficult if you have focused your training on aesthetic dentistry. The easiest way to do this is to take porcelain veneers off the table in the treatment planning stage. Composite resin can be used conservatively with orthodontics to provide a near-complete medium- to long-term solution.

Any time you stick to a single series of training programmes, you start to pick up biases that warp your thinking. You will find that the ideas within the dental profession are as extreme as the religions and political beliefs around the world. The proponents of the various philosophies can be very convincing, but I think each doctor needs to take a step back and make up an individual philosophy that puts the patient first.

If you take the average patient, this means that you will offer fast, affordable, reversible and conservative treatment. Millions has been spent to make people think veneers are better than real teeth; I challenge that idea. Porcelain is not as good as healthy enamel, not now and not ever. Of course, it is a material that serves a purpose but often it is used simply to line the dentist's pockets.

So to recap this approach to care, I suggest you take an STO course from one of the two 6-month braces programmes, add a full orthodontic programme (ideally taught by an orthodontist who has taught orthodontics grad students), take a full-mouth reconstruction programme (or at least a worn dentition component), then if you want you can take a composite technique course.

I personally do not get fancy with composite, since my patients do not have loupes or want to pay double for advanced microscopic cosmetics. What patients do hate is composites that chip/stain. This brings me to use Clearfil AP-X PLT (Kuraray—no endorsement money yet!). Freehand composite bonding is the best way to be able follow the contours of the teeth, so scrap the idea of using a wax-up as an instant makeover if orthodontics would be helpful.

The Clearfil shade XL appears to have a chameleon effect that works for most shades of teeth. If a lighter shade is desired, then a cut-back technique can be employed to modify the final appearance with another shade/material like 3M Supreme (3M ESPE).

From my review of the CRA/Clinicians Report literature, this brand of composite is particularly strong in clinical use, and I have heavily restored cases that are still holding up after five years of service. The composite does not polish very well, so I have started using G-Coat as a final glaze, especially for smokers. I simply tell the patient that if he breaks the fillings, there is a 50 per cent warranty for the first 12 months, regardless of how they were broken.

With orthodontic treatment, you should, as mentioned earlier, try to rebuild any worn teeth before starting braces. Since you will be able to move teeth in three dimensions, you simply build up the teeth to full size and then you move directly into orthodontic records to get started. The occlusion should be left "high" and finalised with the braces.

The change in vertical dimension (VDO) appears to be another handicap that paralyses some dentists. If the patient does not have muscular problems and headaches, there may be no need to move into splint therapy to test a bite change. Simply by looking at the effect enamel replacement would have on the bite and considering how orthodontics could manage the result may be sufficient without an articulator. A less deep overbite and a less trapped mandible appear to be desirable within most schools of training.

The cosmetic training really will begin to come into play with incisal displays, tooth proportions and fuller arches. The arch form after orthodontics usually is very pleasing and mimics the technique of overlaying ceramic on the facial surfaces of the upper bicuspids. The term for this has faded from my memory because I tend to avoid courses that push the use of porcelain.

When I attended the UCLA Aesthetic Continuum, Dr Jimmy Eubank took a few moments to talk about a case in which a young teen had had her teeth disfigured with bulky veneers. He was forced to retreat her teeth but she had been compromised for life. As dentists, we are subject to many sales presentations disguised as courses and we rarely get the truth. The truth is dentistry is not easy and taking one weekend course will not be nearly enough. No guru is going to tell you all that you need to know.

At a recent course on anterior aesthetics taught by Dr Gerald Chiche at the Seattle Study Club, I was forced to prepare a number of veneers on plastic teeth. The burning smell reminded me of dental school, which brought back mixed emotions. I took away the idea of additive cosmetic strategies and the use of minimal reduction if choosing to use ceramic. Bonding to enamel instead of dentine still seems to be the better plan. (I also gave Dr Chiche a few photographs of John Lennon's decayed molar and he shared the fact that he had an original photo of the Beatle that was lost in Katrina—I hope he finds the copy sometime soon!)

As one of the first dentists to combine STO concepts with advanced treatment planning of the worn dentition, I can honestly say that if you can set aside the use of porcelain veneers and substitute some of the treatment modalities mentioned in this article, you will eventually find a way back to ceramic usage with a better empathy for patient care. The public is becoming wiser and the market is shifting towards dentists who are ready to mix up their training.

As my UK dentist colleague Dr Martin Kelleher, who lectures on "veneerial" disease, would say, use the daughter test before you do anything irreversible.

I would add that you owe it to your patients to learn from the best in the profession, and cross-training in continuing education may be the best investment you can make in dental practice. DT

Contact Info

Dr Michael Zuk is the author of the book *Confessions of a Former Cosmetic Dentist*. As a consultant to several marketing programmes, including *HighSpeed Braces.org* and *KillerToothache.com*, the dentist has cultivated unique niches as alternatives to the veneer-based practice model. He can be contacted at drz@bowerdental.com.

MEDIA CME Self-Instruction Program

Dental Tribune Middle East & Africa in collaboration with CAPP introduce to the market the new project mCME - Self Instruction Program.
mCME gives you the opportunity to have a quick and easy way to meet your continuing education needs.
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A comparison in postoperative healing of sites receiving non-surgical debridement augmented with and without a single application of hyaluronan 0.8% gel

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Abstract

Hyaluronic acid forms the basis of the extracellular matrix in which the cell growth takes place. A commercial preparation of hyaluronic acid called Hyaluronan (Gengigel) has recently been developed for intra-oral use to promote healing in inflamed sites and sites affected by periodontal disease. 52 patients with moderate to severe periodontal disease who were medically healthy were selected to receive a single application of Haluronan gel immediately after thorough root surface debridement. Sites to receive the Hyaluronan gel or a placebo gel were selected on a randomised basis for each patient.

Aim: The aim of the study was to determine if any beneficial treatment outcomes derived from a single application of Hyaluronan after nonsurgical therapy.

Materials and Methods 52 patients were selected who had BPE scores of 3 or greater in at least 2 quadrants were selected. Root surface debridement was carried out in all pockets equal or greater than 4 mm. Patients were randomly selected to receive a post debridement topical application of the active gel or a placebo in the treated quadrants. At baseline and 3 months postoperatively, assessment of bleeding on probing and pocket depth were completed. Individual and group mean values were subjected to Student's t-test and linear ANOVA using the SAS statistical software package.

Results have demonstrated highly significant improvements in the clinical variables of bleeding on probing and periodontal pocketing in the sites that received the Hyaluronan compared to the placebo sites that had not received the active gel. It was concluded that highly significant improvements in healing after non-surgical therapy can be achieved by a single topical application of Hyaluronan immediately after root surface debridement. If this observation is borne out by further trials, the potential for achieving enhanced healing after treatment has considerable clinical significance.

Introduction

Chronic Adult Periodontitis affects over 2/3 of all patients in the UK aged greater than 45 years (Agerholm D 2001), and is also the second most common cause of tooth loss in the UK (McCaul LK et al 2001). Treatment of these patients has characteristically involved non-surgical scaling and root- planing to provide a smooth root surface for reattachment, supplemented with intensive oral hygiene instruction, to prevent contamination of the treated site during the healing and reattachment phase. Reattachment has been shown not to occur, and some periodontal pockets seem to be resistant to healing in spite of vigorous mechanical debridement. More recently, this approach to treatment has been reappraised, so that instead of aiming for smooth root surface, treatment now aims to disinfect and detoxify the root surface cementum of affected sites. Topical agents are increasingly being used as adjuncts to manual root surface debridement in an attempt to promote healing.

Although Chlorhexidine irrigation is almost ubiquitous in general dental practise for the supplementation of non-sur- gical periodontal therapy, a recent review has concluded that there is no benefit of this over scaling and root planing alone (Hanes P et al 2003). Locally delivered Chlorhexidine in the form of controlled release resorbable "chips" has been shown to have a significant adjunctive effect (Killoy W 1998), but con- trolled release Doxycycline was shown in a comparative study of topical antibacterials with chlorhexidine (Salvi E et al 2002), to be the preparation of choice. These devices are only effec- tive at the site of placement and are relatively costly. However, increasing evidence indicates that, while plaque is the primary aetiological agent in establishing periodontal disease, the host reaction to the bacterial challenge is crucial to the initiation and progression of periodontal diseases. More recent work has therefore focused on the management of the host response, rather than the microbial challenge from bacterial plaque biofilm.

"Periostat" (Alliance Pharma UK) is a sub antimicrobial dose Doxycycline preparation. It derives its benefit from the well-documented anti-inflammatory properties of the tetracycline group of antibiotics and several studies have concluded that this product achieves significant attachment gains and prob- ing depth reductions over and above those achieved by scal- ing and root planning alone (Abdel et al 2005). However, it has the major disadvantage of being a systemic preparation, with long treatment times, and may need to be repeated at regular intervals. More recently a topically applied anti-inflammatory product based on Hyaluronic acid (Gengigel: Oraldent UK) has been launched. Hyaluronic acid (HA) is a linear polymer de- rived from two repeating disaccharide subunits (D-Glucuronic acid and N-acetylglucosamine), and is a natural constituent of the body's glycosaminoglycan (GAG) population. Its synthetic form is referred to as Hyaluronan, and is available in gel or liquid preparations for topical oral use. It has many properties that make it a potentially ideal molecule for assisting wound healing by inducing early beneficial granulation tissue forma- tion, inhibiting destructive inflammation during the healing phase, promoting epithelial turnover and also connective tis- sue angiogenesis. (Ichikawa et al 2002, Moseley et al 2002,J Chen et al 1999). In addition, it has been demonstrated that HA has antibacterial properties in vitro (Pirnazar et al 1999).

Clinical studies have shown that topical application of Hyaluronan promotes healing of both leg ulcers (Ortonne 1996), and the nasal mucosa after surgery (Soldati et al 1999). It also has been shown to reduce the incidence of high-grade radio- epithelitis in patients who have undergone radiotherapy for head and neck cancer (Liguori et al 1997).

Hyaluronan is a hygroscopic macromolecule and in solutions it is highly osmotic. These properties are likely to be relevant in controlling tissue hydration during changes to the tis- sue such as the inflammatory process or response to tissue injury. Hyaluronan synthesis contributes to local foci of tissue hydration, which is important during cell proliferation and migration. These local foci of tissue hydration weaken cell attachment to the extra cellular matrix allowing temporary detachment to facilitate cell migration and division. In inflammation Hyaluronan has a moderating effect through free radical scavenging (Presti et al 1994) as well as the exclusion of tissue degrading enzymes such as metallproteinases (Fraser et al 1996). All these properties plus the release of cytokines when Hyaluronan binds to its specific receptor CD 44 explain why Hyaluronan plays such a key role in the healing process.

Hyaluronan gel is tasteless, odourless and colourless. It is easy to apply, does not stain teeth and is not inactivated by Sodium Laurel Sulphate. It has no known adverse patient re actions or drug interactions. As Hyaluronan is presented in gel form, it can be cheaply and easily delivered to all areas under- going therapy. When used in combination with non-surgical periodontal therapy, a more effective outcome is achieved.

Aim

The aim of this study was to determine the clinical benefits of a Hyaluronan-based gel (Gengigel Prof) used as an adjunct to non-surgical periodontal therapy.

Methods and materials

52 patients were randomly selected from patients aged 18-65 who attended for treatment for chronic periodontal disease. For inclusion in the study all patients had BPE scores of 3 or greater in at least 2 quadrants. On selection for the study patients received a full mouth assessment of bleeding on probing and pocket depth measurements recorded in millimetres, us- ing a six point charting. Patients were excluded from the study if their medical status or prescribed medication compromised their immune system, if they only had moderate periodontal disease requiring non surgical treatment only, or if they had too few remaining teeth to allow a comparative analysis of test and control sites.

	TIME	N	MEAN	SD	P VALUE
PLACEBO	Baseline	52	1.9945	0.7012	p=0.0003
	3m Post-op	52	1.5030	0.6149	
TEST	Baseline	52	2.0199	0.6137	P<0.0005
	3m Post-op	52	0.8270	0.4648	

Table 1: To demonstrate bleeding on probing in the test and control sites from baseline to the three month post treatment assessment.

	MEAN CHANGE	MEAN DIFFS.	PERCENTAGE
PLACEBO	1.9945 - 1.5030	0.4915	24.6%
TEST	2.0199- 0.8270	1.1929	59.05%
SIGNIFICANCE		P<0.0005	

Table 2: To compare the reduction in bleeding on probing between the test and control sites during the study.

	TIME	N	MEAN	SD	P VALUE
PLACEBO	Baseline	52	3.906	0.9338	p=0.0005
	3m Post-op	52	3.186	1.0885	
TEST	Baseline	52	3.828	0.7842	P< 0.0005
	3m Post-op	52	2.588	0.8759	

Table 3: To demonstrate pocket depth measurements in the test and control sites from baseline to the three month post treatment assessment.

	MEAN CHANGE	MEAN DIFFS.	PERCENTAGE
PLACEBO	3.906 - 3.186	0.72	18.43%
TEST	3.828 - 2.588	1.24	32.39%
SIGNIFICANCE		p= 0.0027	

Table 4: To compare the reduction in pocket depths between the test and control sites during the study.

VARIABLE	MEAN SQUARE	F VALUE	SIGNIFICANCE
DRUG	5.502	18.099	p<0.0005
TIME	35.884	135.942	p<0.0005
DRUG x TIME	6.394	73.342	p<0.0005

Table 5: Summarised results of ANOVA showing the effect of Time x Drug Interactions

All of the clinicians were calibrated against a standard predetermined protocol for the study, to ensure a high level of intra- and inter-examiner reproducibility. This was achieved by means of a preliminary pilot study in which five patients, who were not included in the study, were subjected to repeated measurements of the clinical variables used in the study by all of the clinicians. Both intra and inter-examiner reproducibility was found to be high.

Root surface debridement was carried out in all pockets equal or greater than 4 mm and the healing of these sites was used in the statistical analysis. Debridement was undertaken in two quadrants at a time. Patients were randomly selected to receive a post debridement application of the active gel or the placebo, in the treated quadrants. Wherever possible the left and right quadrants were used as adjunctive gel/non-adjunc- tive gel comparisons, but where this was not possible (due to too few teeth being present), the upper and lower quadrants were compared. 0.8% Hyaluronan gel was applied into the pockets in those sites that had been randomly assigned to re- ceive it, using a prefilled syringe after completion of the me- chanical debridement. The other sites received an application of an inert placebo gel. .

At both baseline and at the three months follow-up assessment appointments, bleeding on probing and pocket depths were measured and annotated for each subject. These varia- bles were then consolidated into individual and then group mean values which were then subjected to simple (Student's t-test) and linear ANOVA using the SAS statistical software package.

Results

It can be seen from table 1 that highly significant improvements occurred in the group bleeding scores in both placebo and test sites from baseline to the three-month review ap- pointment. Similarly table 3 shows highly significant improvements in periodontal pocketing in both the placebo and test groups from baseline to three months after treatment.

In table 2 it can be seen that the mean improvement in bleeding scores in the placebo group was 24.6%, while in the test group it was over double at 59.05%. This is a highly significant incremental improvement ($p<0.0005$). Similarly table 4 illustrates the improvements in pocket depth measurements. In the placebo group pockets improved by an average of 18.43%, whereas in the test group it was nearly double that level of improvement at 32.39%. This is reflected in a highly significant p- value of $p=0.0027$.

While the group on the test drug (Hyaluronan) was shown to have a significant benefit over the time period of the study, the results of ANOVA illustrated in table 5 show that the individually significant results are substantiated when time/drug interactions are accounted for in the analysis.

Figures 1 and 2 graphically demonstrate the compara- tive results in terms of the variables of bleeding and pocket- ing at baseline and at the three-month assessment appoint- ment. From these illustrations it is clear that at baseline the mean values for both the test and placebo group were virtual- ly equivalent, whereas marked differences are evident in both variables at the three-month assessment appointment.

Discussion

Hyaluronan has been identified in all periodontal tissues, being particularly concentrated in the non-mineralised tissues such as gingival and periodontal ligament. It is also present in low concentrations in mineralised tissues such as cementum and alveolar bone. Hyaluronan has many structural and physiologi- cal functions within tissues and is a key component in the series of stages associated with the wound healing process in both mineralised and non-mineralised tissues (i.e. inflamma- tion, granulation tissue formation, epithelium formation and tissue remodelling) (Culp et al1 1979).

As a consequence of its non-toxicity, biocompatibility and numerous biochemical and physiological properties, the use of exogenous hyaluronan applied topically to inflamed periodontal sites, would appear to offer beneficial effects in modulating and accelerating the host response. Several double blind studies have demonstrated the benefi- cial effect of Hyaluronan 0.2% gel in the treatment of Gingivitis. Jentsch et al (2003) showed that 0.2% gel produced a signifi- cant improvement in both clinical and para-clinical variables in plaque induced gin-

→DT page 13