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Dental Review™

Making Education Easy

Issue 13 – 2009

In this issue:

Welcome to the latest edition of Dental Review.

In the last issue we reported on the best way to record smiles for a variety of dental purposes. Camera manufacturers may have the answer with smile detection technology. Olympus seem to have been the first with their Cyber-shot DSC-T300 camera, with other makes now available. These cameras focus on the person and then hold back from taking the image until a smile is recognized. Will this prompt forced smiles, and can it be relied on to cope faultlessly with moustaches and beards? This sounds like a research project looking for a student!

Kind regards,

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Silica nanoparticles to polish tooth surfaces for caries prevention

Authors: Gaikwad RM et al

Summary: These researchers from a university physics department used a polishing technology (chemical mechanical planarisation) to polish the enamel surfaces of teeth to nanoscale roughness. The particle diameters of the polish were in the range 60+ or – 4 nm and were delivered in a commercial slurry at a neutral pH. Exfoliated human deciduous teeth were used, and the surfaces were assessed using atomic force spectroscopy in areas where polishing had been confirmed by light microscopy. Comparisons were made with a toothpaste and a prophy paste. *Streptococcus mutans* were used in the bacterial removal test, and the bacteria were more easily removed from the surfaces polished with the silica particles.

Comment: While silica particles have been used before for polishing teeth, using nanosized particles has not been reported, and making the tooth too 'slippery' for 'bad' bacteria to attach is a nice concept. How long the polishing effect will last and how the effect might influence mineralization processes and the development of plaque is not known.

Reference: J Dent Res. 2008;87:980-983
http://jdr.sagepub.com/cgi/content/abstract/87/10/980

Restoration of occlusal and proximal contacts by a single molar crown improves the smoothness of the masticatory movement

Authors: Watamoto T et al

Summary: This study investigated how variations in occlusal form could influence the smoothness of masticatory movement. The 19 patients involved needed a single gold crown on a non-vital molar. Three crown designs were made, an anatomically correct one, one with a flat occlusal table and a third with a flat occlusal table and no occlusal contacts. Jaw movement trajectories were measured with the different crowns cemented on with a temporary cement. Each crown type was worn for a week and the order of placement was randomized. Proper tooth contacts reduced the variability of jaw movements, with the mandibular crowns more effective at this than the maxillary crowns.

Comment: When crowning a tooth, the tooth itself should benefit but here is confirmation of the masticatory importance of restoring both occlusal form and proximal contacts, even for a single tooth. The authors provide us with some interesting new information to have to hand when discussing the benefits of providing crowns for patients.

Reference: J Dent. 2008;36:984-992

http://tinyurl.com/czpavc

The effects of bracket removal on enamel

Authors: Heravi F et al

Summary: Enamel cracks may develop when orthodontic brackets are debonded and adhesive remnants can remain on the teeth. In this experiment 75 extracted premolars had their buccal surfaces examined for cracks with a stereomicroscope (24x) and colour digital camera and then were etched and metal orthodontic brackets applied. These were then removed with ligature cutters, a bracket remover or a two-blade bracket remover. The enamel surfaces were then reexamined for cracks and an index used to score adhesive remnants. The number of cracks and their lengths increased in all the groups and most of the adhesive remained on the teeth. There was no significant differences between the removal protocols.

Comment: It seems that all these orthodontic bracket removal methods cause some adverse effects at a microscopic level and investigations to develop improved techniques would be worthwhile.

Reference: Aust Orthod J. 2008;24:110-115

http://www.ncbi.nlm.nih.gov/pubmed/19113075

Race/ethnicity and inflammation – is there a link to periodontal disease?

Authors: Albert MA

Summary: African American women have a 30% higher mortality than white women from cardiovascular disease and tend to have higher levels of inflammation than other race/ethnic groups. The black race also has almost twice the prevalence of periodontal disease. However, it is difficult to determine cause and effect due to differences in nutrition, oral care and age. Preterm deliveries are more frequent in black women and in women with periodontal disease. Is heightened inflammation among black women during pregnancy important?

Comment: This commentary-type paper raises many interesting questions. Recent research in Dunedin has found significant gender/race/ethnicity differences in features as diverse as the dimensions of molar pulps and the distance from the alveolar ridge to the cementoenamel junction. Our understanding of the differences in this paper about inflammation leaves us with the problem of deciding where research priorities should lie. Will the treatment of periodontal disease give our patients a more favourable outcome for heart disease and pregnancy-related conditions?

Reference: J Perio. 2008;79:1121-1123

http://www.nature.com/bdj/journal/v205/n12/full/sj.bdj.2008.1079.html

Independent commentary by Associate Professor Nick Chandler of the Department of Oral Rehabilitation, University of Otago

For more information, please go to http://www.ivoclarvivadent.co.nz

Changes in attitudes toward desire for implant treatment: a longitudinal study of a middle-aged and older Swedish population

Authors: Narby B et al

Summary: Three thousand Swedish subjects aged 45 to 69 years were given the same survey in 1989 and 1999 asking about their potential need and interest in implants. In the initial survey few of the responders were interested in implants, but a decade later 92% desired implant treatment. Among those with a treatment need, such as one or more missing teeth or subjects wearing complete dentures, cost was the commonest reason for declining treatment.

Comment: This increase in interest is extremely dramatic and likely due to better awareness and an increase in treatment providers. Interestingly, the number of patients afraid of surgery and side effects increased over the decade studied, and in other publications these are the reasons cited for refusing implant treatment even when it is offered at no charge.

Reference: Int J Prosthodont. 2008;21:481-485

http://www.ncbi.nlm.nih.gov/pubmed/19149061?dopt=Abstract

How long do direct restorations placed within the general dental services in England and Wales survive?

Authors: Burke FJT et al

Summary: Data from over 80,000 patients were analysed over 11 years to 2001 and their dental interventions studied. Information on 503,965 restoration placements and the time to their re-intervention and survival were studied. Small amalgams survived longer than large restorations such as MOD, and composites and glass ionomers performed less well. Restorations done by older dentists and those provided for older patients had shorter times to re-intervention. Patients who changed dentists also had restorations that performed less well.

Comment: With over half a million restorations in this study, many of them of amalgam, these data are of great significance when debating the rights and wrongs and the potential banning of restorative materials. The amalgams studied are likely to have been used in load-bearing situations while the glass ionomers were likely to be cervical. The older dentist/patient findings require further study. The sad part is that these kinds of data, collected by the Dental Estimates Board (later the Dental Practice Board), are no longer kept centrally in the UK as dental services in England are now commissioned locally. I have 47-year-old occlusal amalgams in my first molars put there by an elderly dentist – I had better not let my colleagues look at them.

Reference: Br Dent J. 2009 Jan 10;206(1):E2

http://www.nature.com/bdj/journal/v206/n1/abs/sj.bdj.2008.1042.html

Odontogenic sinus tracts: A cohort study

Authors: Slutzky-Goldberg I et al

Summary: This research was to determine the prevalence, location and distribution of sinus tracts in 1119 subjects referred for endodontic consultation. The diameters of the periapical lesions and paths of origin were determined. One hundred and eight patients had sinus tracts, with most (63%) in the maxilla and most buccally sited (82%). Sinus tracts were strongly associated with broken restorations (53%).

Comment: In most cases, the aetiology of sinus tracts is an infected root canal. The examiner in this case was an endodontic specialist and all referral patients were included, so vital and non-vital teeth would have been in the sample. As the sinus tract is often the only sign of pathology it may be missed when examining the mouth, and lingual and palatal sinus tracts are rarely seen. The broken restoration finding reached statistical significance ($P < 0.01$), so leakage is once again highlighted as a concern for practitioners.

Reference: Quintessence Int. 2009;40:13-18

http://tinyurl.com/akjkv8

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Oral health in preschool children with asthma

Authors: Stensson M et al

Summary: This study examined the oral health of 127 asthmatic children aged 3 and 6 years and a matched, healthy control group. The asthmatic children reported a higher consumption of sugary drinks and were more frequently mouth-breathers than the healthy children. The younger group had a higher caries prevalence.

Comment: The precise relationships in this research were difficult to determine. One difficulty was knowing when the children started having asthma. In common with a previous report, no relationship could be found between the severity of the asthma, how long medications had been taken and the caries prevalence. Nevertheless, it is clear that young asthmatics need very good oral hygiene and advice on suitable drinks.

Reference: Int J Paediatr Dent. 2008;18:243-250

http://tinyurl.com/br5bqs

Reduction in bacterial contamination of toothbrushes using the Violight ultraviolet light activated toothbrush sanitizer

Authors: Boylan R et al

Summary: Ultraviolet light can kill a wide variety of bacteria including some which are resistant to antibiotics. Twenty-five subjects received two toothbrushes for use on even and odd days. Brushes were rinsed after use and one of them was placed in the Violight holder and exposed to 10 minutes of ultraviolet light. The brushes were analysed for 4 types of bacteria. After two weeks it was found that use of the special toothbrush holder reduced the number of colony-forming units by 86%, and there was also evidence that the total bacterial population was reduced.

Comment: Bacteria remain on toothbrushes after use and provide a potential source of recontamination when next used. Limited research also suggests that colonisation of toothbrushes with oral microflora may be related to bacteraemia in some patients. A simple device which helps decontaminate brushes with the push of a single button sounds good. On a more horrid note, certain 'bathroom aerosols' can also contaminate toothbrushes, and it might help that too!

Reference: Am J Dent. 2008;21:313-317

http://www.ncbi.nlm.nih.gov/pubmed/19024257

Palatine rugae and their significance in clinical dentistry

Authors: Patil MS et al

Summary: Rugae are the ridges found in the anterior part of the palatal mucosa behind the incisive papilla. They are well formed at birth and have a typical (fingerprint) pattern and orientation. They can be used as landmarks in orthodontic and prosthodontic treatment and be an aid to determining identity in forensic investigations. They were first classified in 1911 and several systems of description may be used. Studies from around the world have shown associations between the form of the rugae and ethnic groups.

Comment: This seems the strangest topic, and here it is in the national dental journal with the biggest circulation on the planet, and taking up 8 pages. A very interesting paper on a topic that I suspect most of us forgot about some time before we graduated.

Reference: J Amer Dent Assoc. 2008;139:1471-1478

http://jada.ada.org/cgi/content/abstract/139/11/1471

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