



Dental Review™

Making Education Easy

Issue 6 - 2007

In this issue:

- ✿ *Survival options for root canal-treated teeth*
- ✿ *Indications and limitations of the microabrasion technique*
- ✿ *Effect of post-retained composite restorations*
- ✿ *Effect of bleaching on the cemento-enamel junction*
- ✿ *Bacterial leakage of three intracoronal barriers*
- ✿ *Overeruption with partial occlusal contact*
- ✿ *Pulpal reaction with composite resin cement*
- ✿ *Time to survival for the shortened lower dental arch*
- ✿ *Endodontics or implants?*
- ✿ *Do teenage magazines give a genuine view of tooth colour?*

Welcome to the last Dental Review for 2007.

I would like to wish you all a very Merry Christmas and Happy New Year.

Thanks to our sponsors for their ongoing commitment in 2007 and their agreement to continue in 2008.

We hope you find this issue stimulating and look forward to your comments.

Kind regards,

Associate Professor Nick Chandler

Department of Oral Rehabilitation, University of Otago

nickchandler@researchreview.co.nz

Long-term survival of complete crowns, fixed dental prostheses, and cantilever fixed dental prostheses with posts and cores on root canal-treated teeth

Authors: De Backer H et al

Summary: A Belgian undergraduate clinic was the source of records of 1037 crowns, 134 3-unit bridges, 322 bridges and 168 cantilever bridges made 16 to 20 years previously. Comparing vital and non-vital teeth, there was no significant difference in survival rates for crowns (75 and 79% respectively over 18 years). There was no significant difference for 3-unit bridges. There was also no significant difference between prostheses on root filled teeth in the maxilla and mandible.

Comment: This is a strong study because impressions were all taken with the same material, all posts and cores were of the same alloy, all fit surfaces had been sandblasted and the same zinc phosphate cement was used to lute the components under the same strict conditions. No direct restorative techniques or prefabricated posts were used. The comparable result for crowns on vital teeth and for post and core crowns may be partly explained by techniques aimed at removing the least dentine possible, including the use of thin posts and not using prefabricated designs. A key feature of the report is that all the patients were invited into a 6 monthly maintenance programme.

Reference: *International Journal of Prosthodontics* 2007;20:229-234
http://www.quintpub.com/journals/abstract.php3?iss2_id=234&article_id=2764



"Is sensitivity getting on your patients' nerves?" – Alison, Dental Team Leader

Tooth sensitivity is an increasingly common problem among the younger population; around 40% of people over 18 suffer from sensitive teeth.[†]

The pain can be sharp, sudden and deep making it impossible to enjoy favourite foods and drink.

By recommending Sensodyne Total Care you'll give your patients long-lasting results and ongoing protection from tooth sensitivity. Used twice daily, it's a simple solution.

For more information call us free on 0800 540 144.



New Zealand's most recommended toothpaste for sensitive teeth.*

[†]Data on file. *Consumer Market Research Report December 2006. Sensodyne Total Care contains 50mg/g Potassium Nitrate, 7.6mg/g Sodium Monofluorophosphate, 3mg/g Triclosan. Always read the label, use only as directed. If symptoms persist see your dentist. Sensodyne® is a registered trade mark of the GlaxoSmithKline group of companies. GlaxoSmithKline NZ Ltd, AMP Centre, Level 8, Cnr Albert & Customs Sts, Auckland. GSK31100

For more information, please go to <http://www.gsk.co.nz>

Indications and limitations of the microabrasion technique

Authors: Benbachir N et al

Summary: Many discoloured teeth may be treated by vital bleaching. This article goes a stage further and reviews microabrasion, including examples of 3 clinical cases. The technique uses a paste of hydrochloric acid and pumice to remove 0.2 mm of enamel by erosion and abrasion. It may be used for the treatment of fluorosis, postorthodontic demineralization and hypoplasias limited to the outer enamel.

Comment: Histological studies show that microabrasion removes the superficial dysplastic enamel. In the clinical cases a commercial paste containing 6.6% HCl was used. Remineralization with fluorides after the process may be accompanied with home bleaching. The third case shown has enamel opacities affecting incisors and molars. This has been termed molar-incisor hypomineralization, and no clear cause has been found. If the depth of these lesions exceeds 0.2 to 0.3 mm the authors advocate a restorative approach with composites, which is sometimes known as megabrasion. Both techniques are well accepted by patients.

Reference: *Quintessence International* 2007;38:811-815

http://www.quintpub.com/journals/qi/gp.php?journal_name=QI&nameabbr=QI



Dental Review is also made available to Dental Therapists through the kind support of the New Zealand Dental Therapists' Association

Effect of post-retained composite restorations and amount of coronal residual structure on the fracture resistance of endodontically-treated teeth

Authors: Sorrentino R et al

Summary: The investigators used 90 single-rooted maxillary premolars and root filled them to an identical size and taper. Flowable composite was placed in the access chambers, and the teeth had a number of walls removed before composite restoration (distal, MOD, MODB). A subgroup had glass fibre posts cemented into post holes, with 4 mm of root filling material remaining. The teeth were then subjected to simulated occlusal loads. Resistance to fracture was strongly associated with the number of remaining cavity walls. Mechanical resistance of the teeth was enhanced by the presence of the bonded fibre posts. Teeth with the same number of missing walls resisted higher fracture loads if a fibre post was present. Fractures in these teeth were more likely to be repairable if they had happened in a patient.

Comment: Most fractures of root filled teeth are the result of loss of coronal structure due to caries and cavity preparation. Post hole preparation further influences the mechanical characteristics of these teeth; perhaps it is no surprise that dentists do not agree on the techniques or materials for an optimum result. The extracted teeth in the study were caries-free and unrestored; a clinical trial with a large number of patients over an adequate time period is required.

Reference: *American Journal of Dentistry* 2007;20:269-274

<http://www.amjdent.com/Archive/Abstracts/August%202007%20Abstracts.htm#Sorrentino>

Effect of bleaching on the cemento-enamel junction

Authors: Esberard R et al

Summary: Thirty extracted intact teeth were sectioned to provide 30 experimental tooth pieces and 30 controls. Six groups of 5 specimens were exposed to a variety of bleaching procedures and materials (for example hydrogen peroxide, carbamide peroxide and external, internal and combination bleaching methods). The specimens were then examined using a scanning electron microscope and compared with their matching portions. All the bleaching methods brought about morphological changes at the cemento-enamel junction, and all had increased dentine exposure. There were no statistically significant differences between the test groups.

Comment: Studies of the cemento-enamel junction began with light microscopy in 1899, and its variations suggest a predisposition to external resorption, especially after internal bleaching. The effect of external 10% carbamide peroxide in this experiment was minor. The findings of this work may help to explain some patient reports of sensitivity after vital bleaching.

Reference: *American Journal of Dentistry* 2007;20:245-249

<http://www.amjdent.com/Archive/Abstracts/August%202007%20Abstracts.htm#Esberard>

> View the latest job listings at Healthcare Jobs -

<http://www.researchreview.co.nz/jobs.cfm>

Proudly sponsored by TripleO Medical Recruitment



Get tough on dental pain with Panadine⁺ Plus.



Panadine⁺ PLUS

PLEASE REVIEW THIS INFORMATION BEFORE RECOMMENDING. Panadine⁺ Plus contains paracetamol 500mg and codeine phosphate 15mg. Use: Temporary relief from moderate to severe pain. Contraindications: Hypersensitivity to any ingredient in the product; Children under 12 years. Precautions: CNS, respiratory depression; high doses; prolonged use; renal, hepatic impairment; poor CYP2D6 function; lactation. Adverse reactions: **Dependence**; Impairment of mental & physical abilities; nausea, vomiting, constipation; **dizziness**; **drowsiness**. Interactions: **Anticoagulants**; **sedatives**, **tranquillisers**; **drugs affecting gastric emptying**; **chloramphenicol**; **hepatic enzyme inducers**; CYP2D6 inhibitors. Dosage: Adults and children 12 years and over: 2 caplets every 4-6 hours orally with water (maximum 8 caplets in 24hrs). Further information is available from GlaxoSmithKline Consumer Healthcare on request (FREECALL: 0800 540 144). *Panadine is a registered trade mark of the GlaxoSmithKline group of companies. TAPPS NA1840. GLA29231.

For more information, please go to <http://www.medsafe.govt.nz>

An in vitro comparison of bacterial leakage of three common restorative materials used as an intracoronary barrier

Authors: Fathi B et al

Summary: Fifty-five extracted single canal teeth were root filled for this experiment. Two millimetres of gutta percha was then removed from the coronal aspect of each canal and this cavity was filled with an intracoronary barrier material. This was either a permanent glass ionomer cement, a self-etching primer adhesive system with composite, or a self-etching/self-adhering resin. A two-chamber bacterial leakage model using *Enterococcus faecalis* was developed to test for leakage. There was no significant difference ($P > 0.5$) between the 3 materials tested.

Comment: Coronal leakage is known to affect the success of root canal treatment. Gutta percha and sealer alone will leak if exposed to the oral flora, with one bacterial leakage study revealing 50% of root canals completely contaminated within 19 days. All restorative materials leak, but this experiment showed almost 80% fewer teeth showed microleakage compared to the control teeth without barriers.

Reference: *Journal of Endodontics* 2007;33:872-874

<http://dx.doi.org/10.1016/j.joen.2007.03.003>

An investigation of overeruption of posterior teeth with partial occlusal contact

Authors: Craddock HL

Summary: Ninety-one patients with either partially or completely unopposed posterior teeth were involved in this study. Premolar and molar teeth of both arches were included. The patients were all over 18, and their missing teeth had been extracted over 5 years ago and were free to move. The extent of overeruption was measured by scanning the surfaces of study casts and measuring with analysis software. Following opposing tooth loss, teeth with partial contact (30% or less occlusal overlap) had a similar amount of overeruption to those with no occlusal contact in intercuspal position (means of 1.6 mm and 1.7 mm respectively). These teeth had increased mesio-distal tipping, but there was no correlation between the extent of overeruption and the degree of tipping.

Comment: Previous studies have shown that over 80% of unopposed teeth demonstrate some overeruption. The need to replace all missing teeth is a matter of debate; this study shows that partial tooth contact will not necessarily maintain occlusal stability.

Reference: *Journal of Oral Rehabilitation* 2007;34:246-250

<http://dx.doi.org/10.1111/j.1365-2842.2007.01686.x>

Porcelain inlays cemented with composite resin cement: an in vivo investigation of pulpal reaction one year following cementation

Authors: Vigolo P et al

Summary: Eight 13 year old patients, scheduled to lose 4 vital caries-free first premolars for orthodontic reasons, were involved in this experiment. A single operator prepared 3 of the teeth to receive MOD porcelain inlays, while the fourth tooth was untouched as control. A provisional filling was in place for one week before inlay cementation under rubber dam. After one year the 32 teeth were extracted and examined by light microscopy. The number of inflammatory cells (polymorphonuclear leukocytes or mononuclear lymphocytes) were counted in the specimens. No signs of inflammation were found, with the cells seen those usually present in normal pulps.

Comment: Five of the 8 subjects experienced mild sensitivity in their prepared teeth after inlay cementation, which disappeared after 10 to 15 days and did not return during the year of tooth function. The authors comment that the number of teeth involved was small, and that they were healthy teeth to start with. The pulpal reactions from previously damaged teeth could be an area for further study.

Reference: *Journal of Prosthodontics* 2007;16:123-128

<http://dx.doi.org/10.1111/j.1532-849X.2007.00177.x>

Research Review publications are intended for New Zealand health professionals



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

Prevention is easier than treatment...

Simple waterline maintenance with ICX™

ICX eliminates contamination and build-up of deposits plus biofilm in dental unit waterlines. Simply add one ICX tablet to a self-contained water bottle before each filling. ICX is available for both 0.7 litre and 2 litre bottles. For more information on ICX or other A-dec products contact your Ivoclar Vivadent Territory Manager, or phone 0508 486 252.

ivoclar vivadent For more information and orders Freephone 0508 486 252



PRIZES FOR POINTS

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

Time to survival for the restoration of the shortened lower dental arch

Authors: Thomason JM et al

Summary: This randomized controlled trial involved 60 patients waiting for a mandibular bilateral free-end saddle partial denture. They were allocated to a partial denture group or a group receiving a cantilever design resin-bonded bridge. The bonded bridge patients received a single pontic, up to and not beyond the second premolar, with a single abutment used when possible. The partial denture group had their occlusions restored to reflect their opposing posterior dentition (natural teeth, complete denture or partial denture). The removable denture group required more visits over the 5 year period of the study, but there was no significant difference in survival rates for the two types of prosthesis.

Comment: As might be expected, debonding was the most common cause of failure among the adhesive bridges. Most of these events occurred in the first 2 years. The survival of these cantilever bridges was comparable to that of adhesive fixed-fixed designs in other randomized controlled trials. Non-use and loss of teeth were almost equal causes of failure among the removable denture patients, non-use occurring in the first year. This paper provides strong support for considering adhesive bridges for these patients; non-use of removable partial dentures represents a considerable waste of time and resources.

Reference: *Journal of Dental Research* 2007;86:646-650

<http://jdr.iadrjournals.org/cgi/content/abstract/86/7/646>

Privacy Policy: Research Review will record your email details on a secure database and will not release it to anyone without your prior approval. Research Review and you have the right to inspect, update or delete your details at any time.

Disclaimer: This publication is not intended as a replacement for regular medical education but to assist in the process. The reviews are a summarised interpretation of the published study and reflect the opinion of the writer rather than those of the research group or scientific journal. It is suggested readers review the full trial data before forming a final conclusion on its merits.

For teeth requiring endodontic treatment, what are the differences in outcomes of restored endodontically treated teeth compared to implant-supported restorations?

Authors: Iqbal MK et al

Summary: Implants have become a viable treatment option for the management of non-vital compromised teeth. A previous systematic review found that the 4 year survival of single tooth implants was 97%. The authors of this paper (both endodontists) screened 1797 implant papers and 430 endodontic papers published during the period January 1981 to May 2005, finally including 55 and 13 studies respectively for inclusion. Most studies were published in 1990 or later. The authors conclude that there is no difference in survival between the two types of treatment, so decisions must be based on factors other than treatment outcome.

Comment: There are different implants and placement strategies, as there are different root canal techniques, materials and presenting periapical condition. These factors will always complicate comparison studies. Nevertheless, the results are of interest to patients, dentists and to insurance companies (and possibly ACC). Only one study compared both groups of treatments; a randomized controlled trial of the two treatments would be difficult and could present ethical issues. The authors considered the implant papers to be of better quality than those in the endodontic literature.

Reference: *International Journal of Oral and Maxillofacial Implants* 2007;22(Suppl):96-116

http://www.quintpub.com/journals/abstract.php3?iss2_id=225&article_id=2627

Do teenage magazines give a genuine view of tooth colour?

Authors: Chadwick B et al

Summary: The authors collected magazines aimed at 9 to 16-year old girls for a month at a retail outlet. All colour pictures showing at least 5 mm of the central incisor crowns were selected; this provided 268 suitable images for study. Colour was assessed by a single examiner using two common shade guides. With the addition of a 'whiter than shade guide' shade, there were a range of 18 possible shades. In a parallel study girls aged 9 to 16 years attending a dental school in Wales for routine treatment over a one month period were examined using the same shade guides. Fifty three patients were seen. Over three quarters of the magazine images were 'off the shade guide'. A wide range of natural tooth shades were recorded, with A1 on both shade guides being the commonest, and no natural teeth were 'off the guide'.

Comment: Sad, but it seems my 15 year old daughter has a better chance of getting the 80 GB iPod classic she wants for Christmas than the teeth she sees in her magazines. Probably a lot easier for Dad to arrange too!

Reference: *British Dental Journal* 2007;203, E9 (published online 27 July 2007)

<http://dx.doi.org/10.1038/bdj.2007.794>

Enterprise Medical Bureau Can Help You with all your temporary and permanent Dental Staffing Solutions.

Contact Lisa Harris or Melissa Moser today on (09) 306 1949 or email bureau@enterprise.co.nz



➤ Australian Dental Review available now -

Please let your Australian colleagues know!