

Dental Review™

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Issue 14 – 2009

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Welcome to the latest edition of Dental Review.

There's an eclectic mix in this issue. Among the papers is a recent practice-based study about bonding amalgams. Early attempts at improving the seal and retention of amalgam were published as early as 1897, and there was a revival of interest in the 1990s. Some more senior readers may remember the Baldwin technique of condensing amalgam onto a thin layer of wet zinc phosphate cement. To give the issue some 'balance' the word nano appears (it would be difficult to write an issue without!) and there are also items about CT scanning and ultrasound, very much developments of the last half of the last century.

Kind regards,

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Treatment outcomes of dental flossing in twins: molecular analysis of the interproximal microflora

Authors: Corby PMA et al

Summary: Flossing disturbs the development of pathogenic microbial communities and could allow a less damaging flora to develop. Twins share the same genetics and generally have similar lifestyle habits and diets. This paper examined 51 sets of twins aged from 12 to 21. All used a manual toothbrush and toothpaste, but one of each pair also used floss. Twenty-six microbial species, many commonly associated with periodontal disease, were examined in plaque samples, and the floss users featured fewer of these organisms. Cariogenic organisms were similarly suppressed. The group flossing featured species not consistent with periodontal disease or caries.

Comment: While probably everyone would agree that interproximal cleaning is important, not many studies report on how clinically effective it is and its true value in the promotion of gingival health. Here is the paper to mention when challenged by a patient that 'flossing cannot make much of a difference'. The results here were profound, and in only two weeks.

Reference: *J Perio.* 2008;79:1426-33.

<http://www.joponline.org/doi/abs/10.1902/jop.2008.070585>

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Longevity of conventional and bonded (sealed) amalgam restorations in a private general dental practice

Authors: Bonsor SJ et al

Summary: Many materials have been used to fill the interface between amalgam and tooth structure, with composite resins being the material of choice for nearly 30 years. There is very little literature about the clinical performance of bonded amalgams. This study is a retrospective survival analysis of conventionally placed amalgams and those bonded with either Panavia EX or Rely X resins. The work was done by one person over 10 years with over 6,000 Class I and Class II restorations placed. Bonding the amalgams showed no significant benefit, with the bonded restorations showing a significant decline in longevity from 1000 days onwards.

Comment: Most research on restorations is done in a university setting, which may not be representative of general practice. In this work a rubber dam was not applied for any of the restorations, and the paper mentions that this might have influenced the results. It seems the routine use of bonded amalgams cannot be supported.

Reference: *Br Dent J.* 2009;206(2):E3. Epub 16 Jan 2009.

<http://tinyurl.com/c6du42>

The effect of resin-based sealers on fracture properties of dentine

Authors: Jainaen A et al

Summary: Vertical root fracture may occur during or after root canal treatment to leave a tooth which is almost always untreatable. Efforts have been made to develop root filling materials which might restore the strength of treated roots. In this work 120 extracted premolars had their root canals prepared and some were filled using an epoxy- or urethane dimethacrylate (UMDA) sealer and core material. Work of fracture, shear strength and resistance to vertical fracture were measured. Neither the epoxy or UDMA sealers enhanced the fracture resistance.

Comment: Because sealers ideally bond core materials to the surrounding root dentine they should have physical properties like dentine. This work joins a growing mass of very conflicting literature on root reinforcement. There is the potential for the development of new nanoresins which will penetrate dentinal tubules efficiently; together with modifications to the tubule walls, roots might be strengthened.

Reference: *Int Endod J.* 2009;42:136-43.

<http://www3.interscience.wiley.com/journal/121619330/abstract>

Paracetamol overdose in a teenager following placement of a fixed appliance

Authors: Matusiak R and Harley KE

Summary: Orthodontic patients may report significant discomfort after archwire placement or activation, with 40% of teenagers experiencing some discomfort even after one week. Ibuprofen or paracetamol may be recommended. In this case report the 13-year-old patient bought paracetamol tablets from a newsagent without her mother's knowledge, taking 1 g four times daily. Two weeks later she took 16 500-mg tablets in one hour – her mother being unaware of her daughter's pain or purchases. She started vomiting three hours later and was admitted to hospital. Staff considered her to have inadvertently used the medication rather than having a suicidal tendency.

Comment: In the UK, paracetamol overdose is the commonest agent for intentional self-harm, leading to 70,000 hospital admissions annually. Many shops sell the drug, in packs of no more than 16 tablets. The medication is the commonest cause of acute liver failure, but death from overdose is rare. This paper provides an excellent review of paracetamol poisoning. Studies of orthodontic pain show that pre- and postoperative ibuprofen is more effective than paracetamol, and patients should receive advice on analgesia as part of treatment.

Reference: *Dent Update.* 2009;36:33-5.

<http://www.ncbi.nlm.nih.gov/pubmed/19294834>



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Ultrasonography and Doppler ultrasonography in the evaluation of intraosseous lesions of the jaws

Authors: Sumer AP et al

Summary: Computerised tomography (CT) and low-dose cone beam CT may be used in the diagnosis of jaw conditions. Very few ultrasound studies have been performed. This investigation involved 20 patients with 22 jaw lesions in the maxilla or mandible. The ultrasound probe was placed on the skin outside the mouth over the lesion, and lesions classified into three groups. Colour and power Doppler ultrasound allowed evaluation of blood flow, and after surgery the lesions were examined histologically. The ultrasound examination gave accurate information on content of the intraosseous lesions, but did not correlate with the histological diagnoses.

Comment: These are recent developments with the first publication dating from 1996. Studies to date have involved a limited number of lesions, mostly of endodontic origin and none of them malignant. The ability to detect internal vascularisation has potential benefits and ultrasound might be useful to monitor healing.

Reference: *Dentomaxillofac Radiol.* 2009;38:23-7.

<http://dmfr.birjournals.org/cgi/reprint/38/1/23.pdf>

Questioning practicality (letter about dry socket)

Authors: Scott G

Summary: This letter is part of a recent string of correspondence to a journal about dry sockets. It comes from a dentist who established an emergency dental service 3 years ago, and with full appointment books became concerned about 5% of extraction patients returning with the problem. Searching for cheap, simple and practical measures, national clinical guidelines were consulted. A one-minute pre-operative chlorhexidine rinse reduced the incidence of dry sockets by half.

Comment: The comment comes from the dentist, who while appreciating that the guidance is evidence-based enquires about two practical aspects. One is that patients should stop smoking pre-operatively and for at least two weeks after the extraction. The other is that female patients using oral contraceptives should ideally have extractions during days 23 to 28 of the tablet cycle.

Reference: *Br Dent J.* 2009;188. Published online 28 February 2009

<http://www.nature.com/bdj/journal/v206/n4/full/sj.bdj.2009.125.html>

Light cola drink is less erosive than the regular one: An in situ/ex vivo study

Authors: Rios D et al

Summary: Erosion is loss of dental hard tissue from non-bacterial chemical attack and usually involves acids. Eight volunteers wore removable palatal devices fitted with two pieces of human enamel. Over 14 days the blocks were exposed three times daily to either a light cola or a regular cola drink for five minutes. Erosion was analysed by surface profilometry and microhardness change. The light cola specimens showed less erosion than those exposed to regular cola.

Comment: Soft drink consumption is increasing (in the USA by 300% over the past 20 years). The erosive effect of drinks involves factors including pH, buffering, type of acid, surface adhesion, and calcium, phosphate and fluoride content. This is a complex area for further study, with interactions with saliva components also needing attention; the authors suggest experiments to determine if phenylalanine in light cola explains its reduced erosive potential.

Reference: *J Dent.* 2009;37:163-6.

<http://tinyurl.com/d3h6fd>

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

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The application of a night guard for sleep-related xerostomia

Authors: Yamamoto K et al

Summary: Sleep-related xerostomia is dry mouth with a report of dry mouth or throat discomfort which induces awakenings for water intake. Its prevalence in pensioners has been reported to be as high as 24%. In this controlled study 28 patients attending a dry mouth clinic were alternately assigned to two groups, one of which wore a 1.5-mm-thick vacuum-formed ethylene vinyl acetate night guard. Subjective symptoms were assessed with a questionnaire, part of which involved a general impression and part a visual analogue scale. After the two-week treatment substantial improvements were reported in feelings of oral dryness, thirstiness and burning tongue sensation.

Comment: Management of this condition includes mouth rinsing, air humidifiers and salivary substitutes. Bite guards with reservoirs and intraoral lubricating devices have also been used. None of the patients in this study had a drug history suggesting that medication side effects were a cause of their nocturnal hyposalivation. The device described is like a mouth guard and offers a simple and cheap aid for the patient; its long-term effects need investigation.

Reference: *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2008;106(3):e11-4.

<http://tinyurl.com/cv88qe>

Effect of home bleaching systems on enamel nanohardness and elastic modulus

Authors: Azer SS et al

Summary: This study investigated over-the-counter and professionally supervised home bleaching agents (9%, 10% and 14% hydrogen peroxide and 22% carbamide peroxide). The changes in elastic modulus and nanohardness of human enamel after exposure to tray and strip bleaching systems were measured. Nanohardness and elastic modulus were significantly decreased by the home bleaching systems.

Comment: The literature on the short- and long-term effects of bleaching, especially of enamel, is very controversial. This paper provides the background to the debate and a good account of the science behind the tests used, which are developing very rapidly. The authors comment on their inability to follow up the enamel changes some time after bleaching, and mention how remineralisation might affect nanomechanical properties.

Reference: *J Dent.* 2009;37:185-90.

<http://linkinghub.elsevier.com/retrieve/pii/S0300571208003035>

Diagnostic accuracy of panoramic radiography in the detection of calcified carotid artery

Authors: Yoon S-J et al

Summary: Atherosclerosis at the carotid artery bifurcation may lead to stroke. Carotid artery calcifications can be seen on panoramic dental radiographs below the mandibular angle and adjacent to the cervical vertebrae at the C3-4 intervertebral junction. This study involved 110 dental patients for whom panoramic and CT scans were available. Two oral and maxillofacial radiologists examined the panoramic views and the CT scans were viewed by a neuroradiologist. The accuracy of panoramic films in detecting carotid artery calcification was 62.3%, which was considered moderate.

Comment: CT is the 'gold standard' for the detection of these calcifications, with small specks of calcification not being seen on panoramic films. Some might be hidden, superimposed on the cervical vertebrae, and others missed due to errors in patient positioning. While the dental radiograph is unsatisfactory as a screening tool it may be worthwhile considering referring patients at risk of stroke for further diagnosis if calcifications are seen.

Reference: *Dentomaxillofac Radiol.* 2008;37:104-8.

<http://dmfr.birjournals.org/cgi/content/abstract/37/2/104>

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