

Dental Review™

Making Education Easy

Issue 31 – 2012

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Welcome. In this issue, some mysteries of local anaesthesia are revealed by MRI scans, while the same technique is also used to image the TMJ of a patient with a mandibular condyle with four heads. More mundane issues such as cleaning dentures are reported; clearly, the perfect denture cleaner/cleaning regime is not with us yet. Nevertheless, in the future we may be involved in the diagnosis of diabetes and monitoring of blood clotting. Interesting, but more responsibilities perhaps?

Best wishes,

Nick Chandler

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The ability of pulp sensibility tests to evaluate the pulp status in primary teeth

Authors: Hori A et al

Summary: The aim was to establish the ability of thermal and electric pulp tests (EPT) to assess pulp status in primary teeth. Thirty-six children aged 6 to 8 years were involved and 78 teeth investigated. Twenty-two teeth were intact with no evidence of pulp disease and 56 had unknown status but required endodontic treatment due to caries. Each tooth was cold, hot and EPT tested. Heat was provided by a stick of warm gutta-percha. The appearance of the pulp in the access cavity provided the gold standard. The most accurate test was the EPT, followed by heat and cold.

Comment: Tests are frequently used for permanent teeth but there is little evidence of their usefulness for primary teeth; the authors found only one investigation published between 1965 and 2010. This new study suggests EPT alone is valuable for diagnosis in primary teeth. In the experiment, care was taken to avoid the gingivae and adjacent teeth but the teeth were not otherwise isolated. A rubber dam or Mylar strips between adjacent teeth is helpful when dealing with permanent teeth.

Reference: *International Journal of Paediatric Dentistry*. 2011;21(6):441-445

<http://onlinelibrary.wiley.com/doi/10.1111/j.1365-263X.2011.01147.x/abstract>

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Distribution and absorption of local anesthetics in inferior alveolar nerve block: evaluation by magnetic resonance imaging

Authors: Ay S et al

Summary: Forty volunteers received inferior dental and lingual blocks with different local anaesthetics. MRI images were taken immediately and then one and two hours after injection. Localisation and area and intensity of signal were related to onset and duration of analgesia. All the solutions were absorbed after two hours. The adrenaline in some of the solutions did not result in a different distribution or absorption, which was unexpected.

Comment: Our knowledge of where solutions go in the pterygomandibular space is from cadaver studies using MRI and human studies with computerised tomography. MRI does not involve ionising radiation or a contrast medium. This interesting paper gives us an insight into the mystery of where local anaesthetic solution actually goes. One of the subjects had no numbness and the solution had spread to the anterior of the space and did not distribute over the two-hour period. It perhaps explains how I once had a block at 2 pm which suddenly became effective during the six o'clock news long after the complex amalgam had been carved.

Reference: *Journal of Oral and Maxillofacial Surgery*. 2011;69(11):2722-2730

<http://www.joms.org/article/S0278-2391%2811%2900315-6/abstract>

A retrospective review of clinical international normalized ratio results and their implications

Authors: Kassab MM et al

Summary: The international normalised ratio (INR) is a measure of the intrinsic pathway of blood coagulation. The authors searched through over 16,000 charts from three university campuses. In 315 they found INR featured, but in only 247 was there mention that it was within the therapeutic range. For 107 of these the value was not within the correct range for the condition under treatment (atrial fibrillation, deep vein thrombosis, stroke, cardiac valve replacement). This suggests that these patients should be screened in the dental surgery, first to avoid dental complications and secondly to help the patient's doctor with management.

Comment: Traditionally, patients undergo INR tests monthly and anticoagulants are often stopped before dental treatment, although in many cases there is little indication for this. It could be safer if dentists tested their patients themselves before very invasive procedures using a 'point of care' test device.

Reference: *Journal of the American Dental Association*. 2011;142(11):1252-1257

<http://jada.ada.org/content/142/11/1252.abstract>

Effects of different denture cleaning methods to remove *Candida albicans* from acrylic resin denture based material

Authors: Lee H-E et al

Summary: Denture cleaning was investigated using 140 acrylic resin specimens which had been soaked in a *Candida* suspension. Six cleaning methods were used, including toothbrushing, a chemical soak, a brush/soak combination, a 0.2% chlorhexidine mouthwash, ultraviolet in a light box and distilled water (control). The reduction in micro-organism counts was calculated. There was no significant difference between brushing, soaking and the brush/soak combination. The commercial mouthrinse and ultraviolet light gave comparable results.

Comment: Most dentists recommend toothbrushes or chemical methods to clean dentures. Toothbrushes will only remove large debris and are ineffective against biofilms. The paper raises questions about other micro-organisms and the use of higher concentrations of chlorhexidine and sodium hypochlorite against *Candida*, but potential damage to acrylic or metals becomes a problem. Dentures are not particularly easy to clean.

Reference: *Journal of Dental Sciences*. 2011;6(4):216-220

<http://tinyurl.com/denture-cleaning>

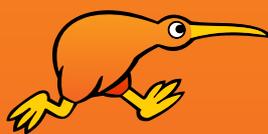


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Gingival blood glucose estimation with reagent test strips: a method to detect diabetes in a periodontal population

Authors: Shetty S et al

Summary: The authors investigated 356 patients with no known history of diabetes who attended a periodontics clinic. They were divided into healthy, gingivitis and periodontitis groups. Blood was collected from the interdental papilla onto a test reagent strip, and patients sent for a glucose tolerance test when indicated. If this was abnormal they were referred to their doctor. Some 47% had elevated gingival blood glucose and 19% of the patients in the survey were diagnosed with diabetes. This was more common in the gingivitis and periodontitis groups.

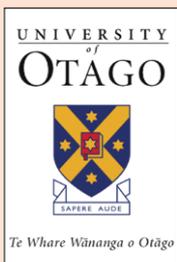
Comment: Diabetes is undiagnosed in about half of the people who have the disease. Periodontal disease has been called the sixth complication of diabetes, so screening a periodontal population sounds beneficial. The authors caution that further studies with larger populations are necessary.

Reference: Journal of Periodontology. 2011;82(11):1548-1555

<http://tinyurl.com/gingival-blood-glucose>

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

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Factors influencing the shade matching performance of dentists and dental technicians when using two different shade guides

Authors: Alomari M, Chadwick RG

Summary: Restorations are usually matched to the shade of the adjacent natural teeth. An additional approach is to record the shade of the prepared tooth so it can be replicated on the die used to make the prosthesis. This study investigated the colour vision of dentists (40) and technicians (18) and related this to their performance matching the shades of 6 prepared extracted teeth. Their results in the colour hue test were not a good predictor of performance, which was not influenced by age or gender.

Comment: Increased patient expectations have led to more science in the field of shade taking. The paper provides a comprehensive review of a subject where many of the findings are conflicting. There seems to be little evidence now that females are better at shade matching than males. A worrying finding was that the tooth preparations were assessed twice, at least two weeks apart, with many participants not recording the shade each time in the same way.

Reference: British Dental Journal. 2011;211(11):E23

<http://www.nature.com/bdj/journal/v211/n11/full/sj.bdj.2011.1006.html>

Tetrafid mandibular condyle: a unique case report and review of the literature

Authors: Şahman H et al

Summary: Bifid and trifid mandibular condyles are uncommon but seen more frequently with CT, cone beam CT and MRI imaging. They are usually incidental findings. The literature features 110 cases of bifid and 4 cases of trifid condyles. These authors report what they term a tetrafid condyle, first seen as an odd-looking condyle on a panoramic dental radiograph and another view to show the TMJ. To eliminate pathology a 3D CT reconstruction was carried out. This showed a four-headed condyle, a variation not described previously. An MRI investigation was then performed to see the position and shape of the articular disc and soft tissues.

Comment: The paper discusses possible aetiology, the main theory being trauma, which has been found in some cases of trifid condyle. MRI is the gold standard for this type of imaging as it shows soft tissue and articular surfaces. Luckily, most of the patients do not report problems.

Reference: Dentomaxillofacial Radiology. 2011;40(8):524-530

<http://dmfr.birjournals.org/content/40/8/524.abstract>

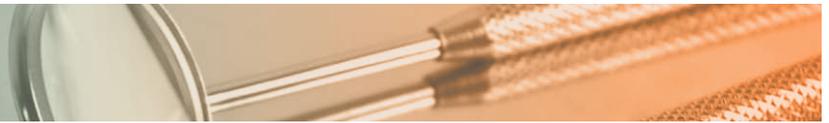
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A clinical predicament – diagnosis and differential diagnosis of cutaneous facial sinus tracts of dental origin: a series of case reports

Authors: Gupta M et al

Summary: Products of pulp infection take the path of least resistance from the root apex through bone and soft tissue. Cutaneous sinus tracts are uncommon but easy to incorrectly diagnose, as they are often symptomless. This paper presents four cases, one in the anterior mandible, two from the mandibular molar region and one from a maxillary premolar. Diagnostic guidelines, use of gutta-percha or lacrimal probes to track the origin and a lengthy differential diagnosis list are provided.

Comment: Sadly, many patients attending with this type of cutaneous problem report months or years of application of creams, taking antibiotics and surgical procedures, while their treatment providers are unaware of the intraoral cause. A tooth isn't necessary – one of the cases reported arose from the tooth socket in a patient with uncontrolled diabetes, and the pathology report was osteomyelitis.

Reference: Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology and Endodontics. 2011;112(6):e132-e136

<http://tinyurl.com/cutaneous-sinus-tracts>

Transmigration of mandibular canines in siblings: A case report

Authors: Kontham U et al

Summary: Transmigration is pre-eruptive migration of a tooth across the midline. It is usually seen in canines, and this paper reports two cases of transmigration of mandibular canines in siblings. The first patient was a 13-year-old girl with an absent canine and the second her 14-year-old brother with a canine erupting between the mandibular central incisors. Both received surgical treatment.

Comment: Transmigrated canines can travel across the midline to lie below the incisor apices, premolars or sometimes even the molars of the other side. This is the first example of the condition being seen in siblings. The authors state that in hindsight they should have examined the younger sibling as soon as the problem was diagnosed in the older child, but no dental abnormalities were reported by their parents.

Reference: Quintessence International. 2012;43(1):45-49

<http://tinyurl.com/Transmigrated-canines>

Microleakage of stainless steel crowns placed on intact and extensively destroyed primary first molars: An in vitro study

Authors: Seraj B et al

Summary: The authors investigated the microleakage of stainless steel crowns (SSC) cemented with glass ionomer cement on 30 extracted primary maxillary and mandibular first molars. Group 1 included intact teeth and Group 2 teeth had extensive caries, and both received standard tooth preparations and SSCs. The teeth were then thermocycled, dyed with methylene blue dye and sectioned. Leakage was scored under a microscope at 100x magnification. Over half the teeth in both groups had minimal leakage, and leakage was not related to the height of residual tooth structure.

Comment: Little work has been done to investigate how the minimal amount of remaining structure in a grossly destroyed tooth will influence SSC leakage. The Group 2 teeth had only 1 mm of sound structure on their lingual, mesial and distal sides. The results suggest that teeth with extensive destruction and otherwise destined for extraction may be successfully restored with an SCC from a leakage perspective.

Reference: Pediatric Dentistry. 2011;33(7):525-528

<http://www.ingentaconnect.com/content/aapd/pd/2011/00000033/00000007/art00011>

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