

According to the *IJE* editorial board decision, article abstracts of the members of “Iranian Association of Endodontists” which are accessible in Medline journals will be published in the winter publication of each *IJE* volume (in alphabetical order)

Asgary S, Eghbal MJ, Parirokh M, Ghanavati F, Rahimi H. A comparative study of histologic response to different pulp capping materials and a novel endodontic cement. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2008 Oct;106(4):609-14. Epub 2008 Aug 20.

OBJECTIVE: The aim of this study was to compare dogs' pulp response to capping with calcium hydroxide cement (Dycal), mineral trioxide aggregate (MTA), and a novel endodontic cement (NEC). **STUDY DESIGN:** Twenty-four canine teeth in 6 beagle dogs were buccocervically exposed and capped with MTA, Dycal, or NEC. Eight weeks later, retrieved samples were observed by optical microscope to grade inflammation, formation of dentinal bridge, calcification, necrosis, and presence of odontoblast cells. **RESULTS:** No inflammation was observed in MTA and NEC groups, and in 75% of each, dentinal bridge was completely formed. In the Dycal group, inflammation and incomplete dentinal bridge were detected in all cases. Although MTA and NEC groups had no significant difference between them in each measure, the difference between all 3 groups was significant ($P < .001$). **CONCLUSION:** MTA and NEC showed similar favorable biologic response in pulp cap treatment, better than Dycal, especially in inducing the formation of dentinal bridge.

Asgary S, Eghbal MJ, Parirokh M. Sealing ability of a novel endodontic cement as a root-end filling material. J Biomed Mater Res A. 2008 Dec 1;87(3):706-9.

This study investigated the potential usage of novel endodontic cement (NEC) as a root-end filling material by comparing its sealing ability with that of mineral trioxide aggregate (MTA) and intermediate restorative material (IRM). Sixty-six single rooted extracted human teeth were cleaned, shaped, and obturated in a similar method. After root-end resection, 3-mm deep root-end cavities were ultrasonically prepared. The samples were divided randomly into 3 test groups, having 20 roots each. Six roots were used as positive and negative controls. Samples were filled with test materials and after one day were immersed in methylene blue dye for 24 h. Roots were sectioned longitudinally and examined under stereomicroscope. Positive and negative controls responded as expected. The increasing order of mean dye microleakage values was $NEC < MTA < IRM$. ANOVA test showed statistically significant differences among experimental groups ($p < 0.001$). Tukey's test revealed no significant difference between NEC and MTA. It was concluded that the sealing ability of NEC and MTA is the same and superior to IRM.

Asgary S, Kamrani FA. Antibacterial effects of five different root canal sealing materials. J Oral Sci. 2008 Dec;50(4):469-74.

The aim of this in vitro study was to assess the antibacterial effects of gray and white mineral trioxide aggregate (GMA and WMTA), calcium hydroxide (CH), Portland cement (PC) and a new endodontic cement (NEC) on various species of microorganisms, using agar diffusion test. A base layer of Petri plates was made using Muller-Hinton agar. Five cavities were made in agar and filled with fresh mixed materials after 24 h. *Pseudomonas aeruginosa*, *Enterococcus faecalis*, *Staphylococcus aureus*, *Escherichia coli* and a mixture of these bacteria were seeded by pour plate. The plates were preincubated for 2 h at room temperature followed by incubation at 37 degrees C. The

inhibition zone diameters were measured at 24, 48 and 72 h. The highest mean diameters of growth inhibition zones were observed around NEC and CH. According to one-way ANOVA, there was a significant difference among test groups ($P < 0.001$), while post-hoc test revealed no significant difference between the mean zone diameters of NEC and CH, and also between MTAs and PC. However, there was a significant difference between CH and NEC in comparison with MTAs and PC groups ($P < 0.001$). It appears that NEC may act as a potent antibacterial agent similar to CH.

Asgary S, Shahabi S, Jafarzadeh T, Amini S, Kheirieh S. The properties of a new endodontic material. J Endod. 2008 Aug;34(8):990-3. Epub 2008 Jun 20.

The purpose of this study was to analyze the physical properties and chemical compositions of a new experimental cement (NEC) and compare them with mineral trioxide aggregate (MTA); pH, working time, setting time, dimensional changes following setting, flow, film thickness, and chemical composition of NEC and MTA were assessed. For chemical compositions, all specimens were imaged and analyzed by scanning electron microscopy and electron probe microanalysis (EPMA). The physical properties were performed according to ISO 6876:2001. Working time, pH, and dimensional changes of NEC and MTA showed similar results. Shorter setting time was obtained with the NEC compared with MTA ($p < 0.05$). The NEC showed more flow than MTA. In addition, the film thickness of the NEC was considerably less than the MTA ($p < 0.01$ and $p < 0.001$, respectively). EPMA investigations indicated that lime (CaO) was the dominant compound in NEC and MTA; however, other compounds were significantly different. It was concluded that the chemical composition of NEC is different compare with MTA; it can be concluded that the NEC exhibits acceptable physical properties.

Hessari H, Vehkalahti MM, Eghbal MJ, Murtomaa H. Tooth loss and prosthodontic rehabilitation among 35- to 44-year-old Iranians. J Oral Rehabil. 2008 Apr;35(4):245-51.

This study aimed to investigate the frequency of tooth loss and the magnitude of prosthodontic rehabilitation based on socio-demographic information among 35- to 44-year-old Iranians. Data ($n = 8240$) were collected by 33 examiners as part of a national survey using WHO criteria for sampling and clinical diagnosis. Gender, age, place of residence and level of education served as socio-demographic information. The number of teeth, functional dentition (subjects with 20 or more teeth) and prosthodontic rehabilitation were used as clinical variables. The chi-square test and logistic regression analysis were the methods of statistical evaluation. Of all subjects, 3% were edentulous. Of dentate subjects, 3% had 1-9 teeth, 21% had 10-19 teeth, 37% had 20-24 teeth and 39% had 25-28 teeth. In total, 76% of dentate subjects enjoyed a functional dentition. Among dentate subjects, 11% of the men and 16% of the women had prosthodontic rehabilitation with higher figures ($P < 0.001$) among women, older subjects and urban residents. Having a functional dentition was more likely among those with higher levels of education [odds ratios (OR) = 1.8, 95% confidence intervals (CI) = 1.6-2.1]. Women (OR = 2.4, 95% CI = 1.8-3.0) and urban residents (OR = 2.4, 95% CI = 1.8-3.3) were the most likely groups to have prosthodontic rehabilitation. Having prosthodontic rehabilitation

was more likely among those lacking a functional dentition (OR = 6.0, 95% CI = 4.8-7.6). The greatest unmet treatment needs were found among those without a functional dentition. Functional dentition should be set as a primary oral health goal among working-age adults.

Hessari H, Vehkalahti MM, **Eghbal MJ**, Samadzadeh H, Murtomaa HT. **Oral health and treatment needs among 18-year-old Iranians**. Med Princ Pract. 2008;17:302-7. Epub 2008 Jun 3.

OBJECTIVE: To investigate the oral health status of 18-year-old Iranians in relation to their gender, place of residence and level of education. **SUBJECTS AND METHODS:** Thirty-three calibrated examiners in 2002 collected data as part of a national survey, according to World Health Organization criteria for sampling and clinical diagnoses, across 28 provinces. The study sample was 4,448; male: 2,021 and female: 2,427 made up of urban: 2,564 and rural: 1,884. Oral health status was assessed in terms of number of teeth, decayed teeth (DT), filled teeth (FT), decayed, missing or filled teeth (DMFT), community periodontal index and plaque index. **RESULTS:** The mean number of teeth was 27.4, with DMFT: 4.3, DT: 3.0 and FT: 0.7. The mean number of sound teeth was higher ($p < 0.01$) in men (24.1 vs. 23.3 in women), FT in urban residents (1.0 vs. 0.2 in rural residents) and DT in women (3.3 vs. 2.8 in men). Three of 4 subjects were in need of restorative treatments. All subjects had dental plaque; 387 (8%) healthy gingiva; 1,016 (23%) exhibited bleeding; 2,025 (48%) calculus and 1,020 (21%) deepened pockets. Men's periodontal status was worse than women's ($p < 0.002$). Low level of education was associated with having 27 or fewer teeth (OR = 1.7), calculus (OR = 1.5) or deep periodontal pockets (OR = 2.7). **CONCLUSION:** A majority of 18-year-old Iranians seem to enjoy a full dentition. High prevalence of dental plaque, calculus, periodontal pockets and untreated dental caries especially among underprivileged groups may put them at risk for tooth loss in adulthood.

Jafarzadeh H, Udoye CI, Kinoshita J. **The application of tooth temperature measurement in endodontic diagnosis: a review**. J Endod. 2008 Dec;34(12):1435-40. Epub 2008 Oct 31.

Teeth with vital pulp are those with an adequate vascular supply, so the circulatory status, and not sensitivity response of the pulp tissue, has been proposed to assess pulp vitality. Some experimental methods have been used to assess this; one of them is the measurement of tooth temperature, which may indicate the pulp vasculature. Some authors have found no differences between the temperatures of teeth with vital and nonvital pulp; however, others found that teeth with nonvital pulp have lower temperatures than teeth with vital pulp. Temperature measurement as a diagnostic procedure has been described with the use of thermocouple, thermistors, infrared thermography, and cholesteric liquid crystals. Many factors may influence the results of the temperature measurement procedure. For creating controlled conditions, each patient should be examined in a thermologic environment. Patients should be asked to refrain from smoking and eating/drinking for 60 minutes before the procedure. The room should be insulated and draft free, and the temperature should be maintained at 20 degrees C. It is desirable to have them lie down or sit with adequate support for the head. The use of a rubber dam is also advocated. Tooth temperature measurement as a diagnostic procedure is reviewed to include description of devices for the test, associated factors, and value of the test.

Mohtasham N, Kharrazi AA, Jamshidi S, **Jafarzadeh H**. **Epithelioid hemangioendothelioma of the oral cavity: a case report**. J Oral Sci. 2008 Jun;50(2):219-23.

Epithelioid hemangioendothelioma is a rare vascular neoplasm which exhibits the potential for malignancy and recurrence as well as the ability to metastasize. Although numerous sites of involvement are possible, these tumors most commonly arise in

soft tissues, lung, liver, bone, and lymph nodes. In this report, we describe a case of oral epithelioid hemangioendothelioma in a child. This tumor appeared as exophytic ulcerated painless masses in the maxillary and mandibular gingiva. Histologically, the tumor was composed of a proliferation of tumor cells arranged in nests, cords, and short strands. Epithelioid cells exhibited abundant eosinophilic cytoplasm with nuclear and cellular pleomorphism and intra-cytoplasmic vacuoles.

Mohtasham N, Babazadeh F, **Jafarzadeh H**. **Intraosseous verrucous carcinoma originating from an odontogenic cyst: a case report**. J Oral Sci. 2008 Mar;50(1):91-4.

Carcinoma originating in bone is uncommon; most of them apparently arise in odontogenic cysts. In this paper, we report an extremely rare case in which, verrucous carcinoma originated from an odontogenic cyst. This lesion was firm and non-tender on palpation and had a white-pink appearance. It was encased in the anterior aspect of the maxilla and exhibited microscopic features of verrucous carcinoma of the oral mucosa. After surgical enucleation, no recurrence or metastasis has been observed up to now. It is mandatory to correlate the clinical and histopathologic findings to establish a true diagnosis.

Jafarzadeh H, Azarpazhooh A, Mayhall JT. **Taurodontism: a review of the condition and endodontic treatment challenges**. Int Endod J. 2008 May;41(5):375-88. Epub 2008 Mar 21.

Taurodontism can be defined as a change in tooth shape caused by the failure of Hertwig's epithelial sheath diaphragm to invaginate at the proper horizontal level. An enlarged pulp chamber, apical displacement of the pulpal floor, and no constriction at the level of the cemento-enamel junction are the characteristic features. Although permanent molar teeth are most commonly affected, this change can also be seen in both the permanent and deciduous dentition, unilaterally or bilaterally, and in any combination of teeth or quadrants. Whilst it appears most frequently as an isolated anomaly, its association with several syndromes and abnormalities has also been reported. The literature on taurodontism in the context of endodontics up to March 2007 was reviewed using PubMed, MEDLINE and Cumulative Index to Nursing & Allied Health Literature. Despite the clinical challenges in endodontic therapy, taurodontism has received little attention from clinicians. In performing root canal treatment on such teeth, one should appreciate the complexity of the root canal system, canal obliteration and configuration, and the potential for additional root canal systems. Careful exploration of the grooves between all orifices particularly with magnification, use of ultrasonic irrigation; and a modified filling technique are of particular use.

Mohtasham N, Habibi A, **Jafarzadeh H**, Amirchaghmaghi M. **Extension of Pindborg tumor to the maxillary sinus: a case report**. J Oral Pathol Med. 2008 Jan;37(1):59-61.

The calcifying epithelial odontogenic tumor is a benign epithelial odontogenic lesion that accounts for less than 1% of all odontogenic tumors. It is most frequently seen in the posterior areas of the mandible. Extension of this lesion to the maxillary sinus is extremely rare. In this paper, we report the fourth of such cases which has been reported, up to now. This tumor was encased between the right maxillary lateral and canine roots with extension to the maxillary sinus. Histologically, the tumor is composed of sheets of epithelial cells with eosinophilic or clear cytoplasm, intercellular bridges, nuclear pleomorphism, but no mitotic figures, amorphous eosinophilic and calcified materials were seen within the sheets of epithelial cells.

Javidi M, Zarei M, Vatanpour M. **Endodontic treatment of a radicular maxillary premolar: a case report**. J Oral Sci. 2008 Mar;50(1):99-102.

We report the diagnosis and successful clinical management of three patients with anatomical variation in the maxillary first premolars. Maxillary first premolars have highly variable root canal morphology, but the presence of three canals is rare. This

article describes the diagnosis and clinical management of first maxillary premolars with three canals and three separate roots, with special reference to radiographic interpretation and access refinements.

Khademi AA, Atbaee A, Razavi SM, Shabani M. **Periodontal healing of replanted dog teeth stored in milk and egg albumen.** *Dent Traumatol.* 2008 Oct;24(5):510-4.

The type of storage medium used to store avulsed teeth prior to replantation has been shown to be a decisive factor in periodontal ligament (PDL) healing. The aim of the present study was to investigate the effect of storage medium on periodontal healing. Thirty teeth from three dogs were endodontically treated to prevent subsequent inflammatory root resorption. The teeth were atraumatically extracted and randomly stored in milk or egg albumen for 3, 6 and 10 h at 4 degrees C. All teeth were splinted for 1 weeks after replanting. After 2 months animals were sacrificed using vital perfusion-fixation and teeth were histologically prepared and evaluated following Andreasen's method. It was found that teeth stored in egg albumen for 6 and 10 h had significantly higher incident of PDL healing than those treated with milk for the same period ($P < 0.05$). The highest incidence of PDL healing was observed in teeth stored in egg albumen for 6 h. The least surface resorption was also evident in this group ($P < 0.05$). The result of this study shows that egg albumen is an excellent storage media for up to 10 h considering its likely availability at most accident sites.

Khademi AA, Saei S, Mohajeri MR, Mirkheshti N, Ghassami F, Torabi nia N, Alavi SA. **A new storage medium for an avulsed tooth.** *J Contemp Dent Pract.* 2008 Sep 1;9(6):25-32.

AIM: The purpose of this study is to determine the efficacy of egg white in maintaining the viability of human periodontal ligament (PDL) cells on avulsed teeth. METHODS AND MATERIALS: The experimental media were: egg white, milk, Hanks' Balanced Salt Solution (HBSS) as the positive control, and tap water as the negative control. The storage times were 1, 2, 4, 8, and 12 hours. Extracted premolar teeth of healthy individuals were rinsed in the media. After trypsinization and subsequent treatment in collagenase, cell viability was determined using trypan blue staining. The two-way analysis of variance (ANOVA) statistical test was used to compare the results among different media. RESULTS: There was no difference in the cell viability between egg white and HBSS media, but there was a statistically significant difference between the viability of PDL cells in egg white medium in comparison with milk ($P < 0.05$) and water ($P < 0.05$). CONCLUSION: Egg white could be suggested as a suitable storage medium. Its principle advantage is its availability.

Khademi AA, Atbaee A, Razavi SM, Shabani M. **Periodontal healing of replanted dog teeth stored in milk and egg albumen.** *Dent Traumatol.* 2008 Oct;24(5):510-4.

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Choi SH, **Lee SJ**, Jung YS, Shin YS, Jun DB, Hwang KH, Liu J, Kim KJ. **Nitroglycerin- and nicardipine-induced hypotension does not affect cerebral oxygen saturation and postoperative cognitive function in patients undergoing orthognathic surgery.** *J Oral Maxillofac Surg.* 2008 Oct;66(10):2104-9.

PURPOSE: The aim of this study was to investigate the influence of nitroglycerin- and nicardipine-induced hypotension on regional cerebral oxygen saturation (rSO(2)) and postoperative cognitive function in patients undergoing orthognathic surgery. PATIENTS AND METHODS: Sixty adult patients scheduled for orthognathic surgery were randomly assigned to either the nitroglycerin group (group 1) or nicardipine group (group 2). After induction of anesthesia, hypotension was induced with continuous infusion of nitroglycerin or nicardipine. Mean arterial pressure (MAP), heart rate (HR), and rSO(2) were measured at the following time points: before induction of anesthesia, immediately before commencing induced hypotension, at 30 and 60 minutes after induced hypotension, and immediately before the end of surgery. Cerebral desaturation was defined as a reduction of rSO(2) less than 75% of baseline for $> = 15$ seconds. The Mini Mental State Examination (MMSE) was conducted before surgery and then repeated after 1 week. RESULTS: Baseline rSO(2) values were similar in the 2 groups. There were no significant differences in rSO(2) values between the 2 groups. Cerebral desaturation was not observed in any of the patients. Both nitroglycerin and nicardipine reduced MAP and increased HR during induced hypotension as compared with the baseline values ($P < .05$). No differences in MAP and HR during baseline and induced hypotension were observed between the 2 groups. Decreased MMSE scores were not observed in any of the patients. CONCLUSION: Cerebral oxygen saturation and postoperative cognitive function were not impaired during nitroglycerin- and nicardipine-induced hypotension in patients undergoing orthognathic surgery.

Ahn SJ, **Lee SJ**, Kook JK, Lim BS. **Experimental antimicrobial orthodontic adhesives using nanofillers and silver nanoparticles.** *Dent Mater.* 2009 Feb;25(2):206-13. Epub 2008 Jul 15.

OBJECTIVES: Experimental composite adhesives (ECAs) containing silica nanofillers and silver nanoparticles were compared with two conventional adhesives (composite and resin-modified glass ionomer [RMGI]) to analyze surface characteristics, physical properties and antibacterial activities against cariogenic streptococci. METHODS: Surface roughness

and surface free energy (SFE) characteristics were measured using confocal laser scanning microscopy and the sessile drop method. Shear bond strength and bond failure interface were analyzed to compare the physical properties. Antimicrobial activities were analyzed by a bacterial adhesion assay, a disk diffusion test, and an optical density measurement of bacterial suspension containing each adhesive. RESULTS: ECAs had rougher surfaces than conventional adhesives due to the addition of silver nanoparticles. ECAs had more similar SFE characteristics to composite than to RMGI. Bacterial adhesion to ECAs was less than to conventional adhesives, which was not influenced by saliva coating. Bacterial suspension containing ECAs showed slower bacterial growth than those containing conventional adhesives. There was no significant difference in shear bond strength and bond failure interface between ECAs and conventional adhesives. SIGNIFICANCE: This study suggests that ECAs can help prevent enamel demineralization around their surfaces without compromising physical properties.

Hyun HK, Lee SJ, Ahn BD, Lee ZH, Heo MS, Seo BM, Kim JW. **Nonsyndromic multiple mandibular supernumerary premolars.** J Oral Maxillofac Surg. 2008 Jul;66(7):1366-9.

PURPOSE: The purpose of this study was to estimate the frequency of and describe the clinical characteristics and complications of patients with nonsyndromic multiple mandibular supernumerary premolars. PATIENTS AND METHODS: Among 110,500 patients seen between July 2003 and January 2007, 32 cases of multiple (2 or more) mandibular supernumerary premolars were found. Data including age, gender, number, distribution, and location of supernumerary premolars, extraction procedure, and related complications (such as cystic changes, root resorption, or adjacent teeth eruption disturbance) were collected. RESULTS: Six of 32 patients were female; the male to female ratio was 4.3:1. Prevalence of nonsyndromic multiple mandibular supernumerary premolars was 0.029%. Mean age was 17.8 years. Root resorption of an adjacent tooth was found in 1 patient. Eruption anomalies were found in 5 patients and included impaction of a permanent tooth, prolonged retention of a deciduous tooth, and displacement of an adjacent tooth. Supernumerary teeth locations were predominantly lingual except for 4 teeth. CONCLUSION: Prevalence found in this study was lower compared with previous studies. However, the rate of related complications was higher, even though the mean age was relatively low. Surgical intervention should be considered to prevent unwanted sequelae for any signs of complication

Jung IY, Lee SJ, Hargreaves KM. **Biologically based treatment of immature permanent teeth with pulpal necrosis: a case series.** J Endod. 2008 Jul;34(7):876-87. Epub 2008 May 16.

This case series reports the outcomes of 8 patients (ages 9-14 years) who presented with 9 immature permanent teeth with pulpal necrosis and apical periodontitis. During treatment, 5 of the teeth were found to have at least some residual vital tissue remaining in the root canal systems. After NaOCl irrigation and medication with ciprofloxacin, metronidazole, and minocycline, these teeth were sealed with mineral trioxide aggregate and restored. The other group of 4 teeth had no evidence of any residual vital pulp tissue. This second group of teeth was treated with NaOCl irrigation and medicated with ciprofloxacin, metronidazole, and minocycline followed by a revascularization procedure adopted from the trauma literature (bleeding evoked to form an intracanal blood clot). In both groups of patients, there was evidence of satisfactory postoperative clinical outcomes (1-5 years); the patients were asymptomatic, no sinus tracts were evident, apical periodontitis was resolved, and there was radiographic evidence of continuing thickness of dentinal walls, apical closure, or increased root length.

Lim BS, Lee SJ, Lee JW, Ahn SJ. **Quantitative analysis of adhesion of cariogenic streptococci to orthodontic raw materials.** Am J Orthod Dentofacial Orthop. 2008 Jun;133(6):882-8.

INTRODUCTION: Knowledge of adhesion patterns of cariogenic streptococci to orthodontic materials can provide valuable information on the cause of enamel demineralization during orthodontic treatment. The purpose of this study was to investigate the adhesion of 2 cariogenic streptococci strains to 7 orthodontic raw materials (3 light-cured orthodontic adhesives, 3 bracket raw materials, and hydroxyapatite) with respect to bacterial species, incubation time, and saliva coating. METHODS: Each material was incubated with unstimulated whole saliva or phosphate-buffered saline solution for 2 hours. Binding assays were then performed by incubating tritium-labeled cariogenic streptococci with each raw material for 3 or 6 hours. RESULTS: The degree of adhesion varied by material type. Generally, adhesion of cariogenic streptococci was significantly higher for bonding adhesives than for bracket materials, and adhesion to resin-modified glass ionomer was the highest. A longer incubation time generally increased bacterial adhesion, whereas saliva coating did not significantly influence bacterial adhesion. CONCLUSIONS: Bonding adhesives around brackets should be removed carefully during the bonding procedure to avoid enamel decalcification.

Kim E, Song JS, Jung IY, Lee SJ, Kim S. **Prospective clinical study evaluating endodontic microsurgery outcomes for cases with lesions of endodontic origin compared with cases with lesions of combined periodontal-endodontic origin.** J Endod. 2008 May;34(5):546-51. Epub 2008 Mar 6.

The aim of this study was to evaluate the outcomes of endodontic microsurgery by comparing the healing success of cases having a lesion of endodontic origin compared with cases having a lesion of combined endodontic-periodontal origin. Data were collected from patients in the Department of Conservative Dentistry, Dental College, Yonsei University, Seoul, Korea between March 2001 and June 2005. A total number of 263 teeth from 227 patients requiring periradicular surgery were included in this study. Patients were recalled every 6 months for 2 years and every year thereafter to assess clinical and radiographic signs of healing. A recall rate of 73% (192 of 263 patients) was obtained. The successful outcome for isolated endodontic lesions was 95.2%. In endodontic-periodontal combined lesions, successful outcome was 77.5%, suggesting that lesion type (ABC vs DEF) had a strong effect on tissue and bone healing.

Lee SK, Lee ZH, Lee SJ, Ahn BD, Kim YJ, Lee SH, Kim JW. **DLX3 mutation in a new family and its phenotypic variations.** J Dent Res. 2008 Apr;87(4):354-7.

Tricho-dento-osseous syndrome (TDO) is an autosomal-dominant disease characterized by curly hair at birth, enamel hypoplasia, taurodontism, and a thick cortical bone. A common DLX3 gene mutation (c.571_574delGGGG) has been identified in multiple families with variable clinical phenotypes. Recently, another DLX3 gene mutation (c.561_562delCT) was reported to cause amelogenesis imperfecta with taurodontism (AIHHT). We identified a Korean family with overlapping phenotypes of TDO and AIHHT. We performed mutational analysis to discover its genetic etiology. The identified mutation was c.561_562delCT mutation in the DLX3 gene. The enamel was hypomature and hypoplastic. The characteristic taurodontic features were not identified. Increased bone density or thickness could not be revealed by cephalometric, hand-wrist, and panoramic radiographs. Affected individuals reported that their nails were brittle, and they had curly hair at birth. This study clearly showed that the c.561_562delCT mutation had not only enamel defects, but also other clinical phenotypes resembling those of TDO syndrome.

Lee SJ, Ahn SJ, Kim TW. Patient compliance and locus of control in orthodontic treatment: a prospective study. *Am J Orthod Dentofacial Orthop.* 2008 Mar;133(3):354-8.

INTRODUCTION: Increased understanding of orthodontic patients will improve communication between dentist and patient; this is important for an optimal treatment outcome. In this prospective study, we addressed the relationship between patient compliance and locus of control (LOC) characteristics and evaluated posttreatment changes in LOC profiles. **METHODS:** Two types of LOC questionnaires, the Rotter internal control scale (RICS) and the Nowicki-Strickland external control scale (NSECS), were given to 561 patients before conventional orthodontic treatment. After orthodontic treatment, the same questionnaires were readministered, and patient compliance was evaluated by an orthodontist and 3 dental hygienists. LOC scores were calculated at the end of the examination period. The difference in LOC between the good and poor compliance groups, and the posttreatment changes in LOC were evaluated. **RESULTS:** There was no significant difference in RICS and NSECS profiles between the good and poor compliance groups. NSECS decreased significantly after orthodontic treatment, but there were no significant changes in RICS. **CONCLUSIONS:** Patient compliance appears to be a complex factor that cannot be predicted by LOC evaluation before orthodontic treatment. Patients who underwent orthodontic treatment showed decreased external control dispositions.

Chung SH, Heo SJ, Koak JY, Kim SK, Lee JB, Han JS, Han CH, Rhyu IC, **Lee SJ. Effects of implant geometry and surface treatment on osseointegration after functional loading: a dog study.** *J Oral Rehabil.* 2008 Mar;35(3):229-36.

The purpose of this study was to evaluate the geometry and surface characteristics of osseointegration after functional loading by radiographic, periodontal and histomorphometric analyses. We analysed three groups of implants with different geometry and surface characteristics using experimental dogs. The control group received Brånemark implants (group 1). Group 2 and group 3 implants each had a 0.5-mm pitch height but differed in surface characteristics. Group 2 implants were machine surfaced and group 3 implants were thermally oxidized at 800 degrees C for 2 h in a pure oxygen atmosphere. For these experiments, which used a total of four healthy beagle dogs, the implants were randomly installed into the extracted first, second and third premolar positions. The animals received radiographic and clinical periodontal examinations at 6 and 12 months post-loading, and were then killed for histomorphometric analysis. The radiographic analysis showed that mean crestal bone resorption in the control group was greater than that observed in the experimental groups ($P < 0.05$). The percentage of bone-to-implant contact for group 3 (83.7%) was significantly higher than in groups 1 (74.4%) and 2 (75.0%) ($P < 0.05$). Overall, implant geometry and surface treatment affected the rate of crestal bone resorption and bone healing surrounding the dental implants.

Jung IY, Kim JH, Kim ES, Lee CY, **Lee SJ. An evaluation of buccal infiltrations and inferior alveolar nerve blocks in pulpal anesthesia for mandibular first molars.** *J Endod.* 2008 Jan;34(1):11-3.

We compared the anesthetic efficacy of inferior alveolar nerve blocks (IANBs) with that of buccal infiltrations (BIs) in mandibular first molars. Using a crossover design, all subjects received a standard IANB or a BI of 1.7 mL of 4% articaine with 1:100,000 adrenaline (Septanest; Septodont, Saint-Marquand-Fosses, France) on two appointments separated by at least 1 week. Pulpal anesthesia was determined by using an electric pulp tester. Electric pulp testing was repeated at 5, 8, 11, 15, 20, 25, and 30 minutes after the injections. Anesthesia was considered successful if the subject did not respond to the maximum output of the pulp tester at two or more consecutive time points. Fifty-four percent of the BI and 43% of the IANB were successful; the difference was not significant ($p = 0.34$). The onset of pulpal

anesthesia was significantly faster with BI ($p = 0.03$). In conclusion, BI with 4% articaine for mandibular first molars can be a useful alternative for clinicians because compared with IANB it has a faster onset and a similar success rate.

Vosoughhosseini S, **Loffi M, Shahi S, Baloo H, Mesgariabasi M, Saghiri MA, Zand V, Rahimi S, Ranjesh B. Influence of white versus gray mineral trioxide aggregate on inflammatory cells.** *J Endod.* 2008 Jun;34(6):715-7. Epub 2008 Apr 15.

The aim of this investigation was to compare the quantity of inflammatory cells in response to white and gray mineral trioxide aggregate (MTA) in subcutaneous connective tissue of rats. Fifty Wistar rats were used in this study. Polyethylene tubes were filled with gray or white MTA and empty ones serving as the control group were implanted into subcutaneous tissue and harvested after 7-, 15-, 30-, 60-, and 90-day intervals. Sections of 5 microm were stained with hematoxylin and eosin and observed under a light microscope. Inflammatory reactions were categorized as 0, none (without inflammatory cells); 1, mild (inflammatory cells $< \text{or} = 25$); 2, moderate (25-125 inflammatory cells); and 3, severe (more than 125 inflammatory cells). Statistical analysis was performed with the Kruskal-Wallis test. Both kinds of MTA provoked severe inflammatory reaction after 7 days, which significantly differed from control group ($p < 0.05$). However, there were no significant differences at any time period beyond 15 days ($p > 0.05$).

Loffi M, Vosoughhosseini S, Zand V, Fatemi A, Shyehzadeh V, Ranjesh B. A mandibular second premolar with three canals and atypical orifices. *J Oral Sci.* 2008 Sep;50(3):363-6.

Mandibular second premolars with three canals (Type V, Vertucci) and separate foramina are very rare. The anatomy of the pulp chamber floor in these premolars usually reveals one lingual and two buccal orifices at the same level. This case report describes a second premolar with three canals and an unusual pulpal floor anatomy with one distobuccal and one distolingual orifice at the same level and an orifice on the mesiolingual wall. Very careful examination of the pulpal space, preferably with an optical device, is recommended to locate any unusual orifices.

Modaresi J, Dianat O, Soluti A. Effect of pulp inflammation on nerve impulse quality with or without anesthesia. *J Endod.* 2008 Apr;34(4):438-41. Epub 2008 Mar 4.

Absence of complete anesthesia in teeth with acutely inflamed pulp is a well-known clinical symptom, but the mechanism behind this symptom is poorly understood. In the current electrophysiologic study, afferent nerve fiber responses of the inflamed tooth with and without anesthesia were compared with normal teeth. Seventeen cats were used in this experimental study. After inducing inflammation in one canine tooth, the responses of afferent nerves from the inflamed and control contralateral canine tooth neurons were compared before and after application of anesthesia. In most cases, 2 distinct responses in both normal and inflamed sites were recorded. The conduction velocity was significantly lower in the nerve to the inflamed side compared with the control side. In contrast, the response intensity was significantly higher in the inflamed side compared with the control side. It was also found that it was markedly more difficult to inhibit impulse transmission by using anesthesia on the inflamed side, whereas there was no trouble inhibiting impulses on the control side.

Mohammadi Z. Evaluation of residual antibacterial activity of three concentrations of new root canal irrigation solution. *N Y State Dent J.* 2008 Nov;74(6):31-3.

The purpose of this in vitro study was to compare the antimicrobial substantivity of three concentrations (100%, 10%, 1%) of MTAD in bovine root dentin. One hundred and ten dentin tubes prepared from bovine incisors were infected in vitro for 14 days with *Enterococcus faecalis*. The specimens were divided

into five groups as follows: MTAD 100%; MTAD 10%; MTAD 1%; infected dentin tubes (positive control); and sterile dentin tubes (negative control). Dentin chips were collected with round burs into tryptic soy broth (TSB). After culturing, the number of colony-forming units (CFU) was counted. In all experimental groups, CFU was minimum in the first cultures; the results obtained were significantly different from each other at any time period ($P < 0.05$). In the first culture, the MTAD 100% group and MTAD 1% group showed the lowest and highest number of CFU, respectively. In each group, the number of CFUs increased significantly by time-lapse ($P < 0.05$). In conclusion, the substantivity of MTAD100% was significantly greater than two other concentrations of MTAD.

Mohammadi Z. Sodium hypochlorite in endodontics: an update review. *Int Dent J.* 2008 Dec;58(6):329-41.

The major objective in root canal treatment is to disinfect the entire root canal system. This requires that the pulpal contents be eliminated as sources of infection. This goal may be accomplished using mechanical instrumentation and chemical irrigation, in conjunction with medication of the root canal between treatment sessions. Microorganisms and their by-products are considered to be the major cause of pulpal and periradicular pathosis. In order to reduce or eliminate bacteria and pulpal tissue remnants, various irrigation solutions have been suggested to be used during treatment. Sodium hypochlorite, an excellent non-specific proteolytic and antimicrobial agent, is the most common irrigation solution used during root canal therapy. The purpose of this paper was to review different aspects of sodium hypochlorite use in endodontics.

Mohammadi Z. Orthograde root filling of an immature nonvital tooth using MTA. *Dent Today.* 2008 Jul;27(7):102, 104-5.

Mohammadi Z, Shahriari S. Residual antibacterial activity of chlorhexidine and MTAD in human root dentin in vitro. *J Oral Sci.* 2008 Mar;50(1):63-7.

The purpose of this in vitro study was to compare the antimicrobial substantivity of BioPure MTAD, 2% chlorhexidine (CHX) and 2.6% sodium hypochlorite (NaOCl) in human root dentin. One hundred and ten dentin tubes prepared from human maxillary incisors were infected in vitro for 14 days with *Enterococcus faecalis*. The specimens were divided into five groups as follows: CHX; BioPure MTAD; NaOCl; infected dentin tubes (positive control); and sterile dentin tubes (negative control). Dentin chips were collected with round burs into Brain Heart Infusion (BHI) broth. After culturing, the number of colony-forming units (CFU) was counted. In all experimental groups, CFU was minimum after treatment (day 0), and the results obtained were significantly different from each other at any time period ($P < 0.05$). After treatment, the NaOCl group and BioPure MTAD group showed the lowest and highest number of CFU, respectively. In each group, the number of CFUs increased significantly by time-lapse ($P < 0.05$). In conclusion, the substantivity of BioPure MTAD was significantly greater than CHX and NaOCl.

Mousavinasab M, **Namazikhah MS**, Sarabi N, Jajarm HH, **Bidar M**, Ghavamnasiri M. **Histopathology study on pulp response to glass ionomers in human teeth.** *J Calif Dent Assoc.* 2008 Jan;36(1):51-5.

OBJECTIVE: Evaluation of the pulpal response to a resin-modified glass ionomer, a conventional glass ionomer and calcium hydroxide. METHODS AND MATERIALS: Fifty-five deep Class V cavities were lined with Vivaglass Liner, Chembond Superior and Dycal. After seven, 30, and 60 days the teeth were extracted and a histological assessment was performed. RESULTS: There was no statistically significant difference in pulpal response among the three groups for the same time interval ($P > 0.05$). CONCLUSION: Light-cured glass

ionomers have similar advantages to conventional glass ionomers.

Namazikhah MS, Nekoofar MH, Sheykhrezae MS, Salariyeh S, Hayes SJ, Bryant ST, Mohammadi MM, Dummer PM. The effect of pH on surface hardness and microstructure of mineral trioxide aggregate. *Int Endod J.* 2008 Feb;41(2):108-16. Epub 2007 Nov 27.

AIM: To evaluate the surface microhardness of mineral trioxide aggregate (MTA) specimens following exposure of their surface to a range of acidic environments during hydration. In addition, the morphological microstructure features of samples were studied by scanning electron microscopy (SEM). METHODOLOGY: White ProRoot MTA (Dentsply Tulsa Dental, Johnson City, TN, USA) was mixed and packed into cylindrical polycarbonate tubes. Four groups, each of 10 specimens, were formed using a pressure of 3.22 MPa and exposed to pH 4.4, 5.4, 6.4 and 7.4, respectively, for 4 days. Vickers microhardness of the surface of each specimen was measured after exposure. Four groups of two specimens were prepared and treated in the same way prior to qualitative examination by SEM. Data were subjected to one-way anova and post hoc Tukey's test. RESULT: The greatest mean surface hardness values (53.19 +/- 4.124) were observed following exposure to pH 7.4 with the values decreasing to 14.34 +/- 6.477 following exposure to pH 4.4. The difference between these values at the 95% CI (33.39-44.30) was statistically significant ($P < 0.0001$). There were no distinct morphological differences between groups in terms of the internal microstructure. However, a trend was observed that the more acidic the solution, the more extensive the porosity of the specimens. CONCLUSION: Under the conditions of this study, surface hardness of MTA was impaired in an acidic environment.

Uzun O, Topuz O, Tinaz C, **Nekoofar MH**, Dummer PM. **Accuracy of two root canal length measurement devices integrated into rotary endodontic motors when removing gutta-percha from root-filled teeth.** *Int Endod J.* 2008 Sep;41(9):725-32. Epub 2008 Jul 14.

AIM: To evaluate ex vivo the accuracy of the integrated electronic root canal length measurement devices within TCM Endo V and Tri Auto ZX motors whilst removing gutta-percha and sealer from filled root canals. METHODOLOGY: Forty freshly extracted maxillary and mandibular incisor teeth with mature apices were selected. Following access cavity preparation, the length of the root canals were measured visually 0.5 mm short of the major foramen (TL). The canals were prepared using the HERO 642 system and then filled with gutta-percha and AH26 sealer using a lateral compaction technique. After 7 days the coronal temporary filling was removed and the roots mounted in an alginate experimental model. The roots were then randomly divided in two groups. The access cavities were filled with chloroform to soften the gutta-percha and allow its penetration using the Tri Auto ZX and the TCM Endo V devices in groups 1 and 2, respectively. The 'automatic apical reverse function' (ARL) of both devices was set to start at the 0.5 setting and the rotary instrument inserted inside the root canal until a beeping sound was heard and the rotation of the file stopped automatically. Once the auto reverse function had been initiated, the foot pedal of the motor was inactivated and the rubber stop placed against the reference point. The distance between the file tip and rubber stop was measured using a digital calliper to 0.01 mm accuracy (ARL). Then, a size 20, 0.02 taper instrument was attached to each device and inserted into the root canals without rotary motion until the integrated ERCLMDs positioned the instrument tips at the 0.5 setting as suggested by the devices. This length was again measured using a digital calliper (EL). The Mann-Whitney U-test was used to investigate statistical differences between the true canal length and those indicated by the two devices when used in 'automatic ARL' and when inserted passively (EL). RESULTS: In the presence of gutta-percha, sealer and

chloroform, the auto-reverse function for the Tri Auto ZX and TCM Endo V, set to start at 0.5 level, was initiated beyond the foramen in 60% and 95% of the samples, respectively during active (rotary) penetration of the instruments. There was a statistically significant difference between the devices for the mean discrepancies between the length at which the auto reverse function was initiated and the true length ($P < 0.001$). Electronic detection of the apical terminus when the instruments were introduced passively (not rotating) was beyond the foramen in 20% and 37% of cases in the Tri Auto ZX group and the TCM Endo V group, respectively. There was a statistically significant difference between the devices for the mean discrepancies between the electronically determined (passive) length and true length ($P < 0.01$). **CONCLUSION:** The auto reverse function of the Tri Auto ZX and TCM Endo V devices, set to start at 0.5 level, were initiated beyond the foramen in the majority of root-filled teeth during active (rotating) penetration of root filling material. Thus, this automatic function must be used with caution when removing gutta-percha root fillings. There were significant differences between the accuracy of measurements in active (rotating) and passive (not-rotating) modes; both devices were more accurate when used in passive mode. However, the Tri Auto ZX was significantly more accurate in a greater proportion of cases.

Rahimi S, Shahi S, Nezafati S, Revhani MF, Shakouie S, Jalili L. In vitro comparison of three different lengths of remaining gutta-percha for establishment of apical seal after post-space preparation. J Oral Sci. 2008 Dec;50(4):435-9.

The quality of apical seal with regard to the length of remaining gutta-percha following post-space preparation is still controversial. The purpose of this in vitro study was to compare three different lengths of remaining gutta-percha for apical seal after post-space preparation. A total of 126 single-rooted extracted maxillary human anterior teeth with intact apices, straight roots, and without resorption were used in this study. The root canals were prepared and filled with gutta-percha and AH26 sealer. The post-space preparation was accomplished. Ninety-six teeth were randomly divided into three groups (4, 5 and 6 mm of gutta-percha was retained in group 1, 2 and 3, respectively). Thirty teeth were considered for the control groups in which 5 teeth served as positive and 5 teeth served as negative controls. The specimens were placed in India ink for 48 hours and then divided into two halves. The amount of leakage was observed and measured with a stereomicroscope at x 16 magnification and 0.1 mm accuracy. The results showed that there were significant differences among the three experimental groups ($P < 0.05$). The best apical seal after post-space preparation was associated with the maximum length of remaining gutta-percha in the apical portion of the treated teeth.

Rahimi S, Shahi S, Lotfi M, Yavari HR, Charehjo ME. Comparison of microleakage with three different thicknesses of mineral trioxide aggregate as root-end filling material. J Oral Sci. 2008 Sep;50(3):273-7.

The aim of this study was to compare the microleakage at three different thicknesses of mineral trioxide aggregate (MTA) as a root-end filling material. Ninety extracted human maxillary incisor teeth were selected and the root canals of the teeth were cleaned, shaped and obturated with gutta percha and AH-plus sealer. Teeth were randomly divided into 3 groups each containing 20 experimental samples, and 5 positive and 5 negative controls. In the first, second and third experimental groups, cavities of 1 mm, 2 mm and 3 mm in depth, respectively, were prepared and filled with MTA. Leakage was determined by the dye penetration method using India ink, and a stereomicroscope at x16 magnifications and 0.1 mm accuracy. The microleakage in the 3-mm and 2-mm root-end cavities was less than at 1 mm depth, but analysis of variance revealed no significant differences among the three different thicknesses

Rahimi S, Shahi S, Lotfi M, Zand V, Abdolrahimi M, Es'haghi R. Root canal configuration and the prevalence of C-shaped canals in mandibular second molars in an Iranian population. J Oral Sci. 2008 Mar;50(1):9-13.

A total of 139 extracted mandibular second molars were injected with India ink and demineralized. They were made clear and transparent with methyl salicylate, and the anatomy of their canals was studied. It was found that 86.3% of mandibular second molars had two roots, 9.3% had one root, and 4.3% had three roots. Ninety percent of the mesial roots of the mandibular second molars with two roots had two canals (predominantly with a type II or III configuration), and 77.5% of the distal roots of these teeth had one canal (predominantly with a type I configuration). Among the mandibular second molars, 7.2% had C-shaped canals and these configurations were seen mostly in single-rooted mandibular second molars. The results of this study indicate that mandibular second molar teeth have many variations in the number of roots and the morphology of their canals. Therefore it should not be assumed that all mandibular second molar teeth have two roots and three canals.

Lee AZ, Jiang J, He J, **Safavi KE**, Spangberg LS, Zhu Q. **Stimulation of cytokines in osteoblasts cultured on enamel matrix derivative.** Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2008 Jul;106(1):133-8.

OBJECTIVE: The purpose of this study was to evaluate the influence of enamel matrix derivative (EMD) on the release of transforming growth factor beta 1 (TGF-beta1), interleukin-6 (IL-6), insulin-like growth factor I (IGF-I), bone morphogenetic protein 2 (BMP-2), and osteoprotegerin (OPG) in human and mouse osteoblasts. **STUDY DESIGN:** Human MG-63 and mouse MC3T3-E1 cells were seeded onto 6-well culture plates at an initial density of 5,000/cm² and grown in Dulbecco's eagle medium (DMEM) with 10% fetal bovine serum for 24 h. Then cells were cultured either with 100 microg/mL EMD added to DMEM or with DMEM only. After 2, 5, and 9 days' incubation the culture medium was collected and analyzed by enzyme-linked immunosorbent analysis. Data were analyzed using Student t test. **RESULTS:** The EMD treatment significantly increased the production of IL-6 and TGF-beta1 ($P < .05$) at all time points. The release of OPG was also increased in mouse osteoblasts ($P < .05$). IGF-I and BMP-2 were not detected in both control and EMD-treated groups. **CONCLUSION:** This study suggests that the stimulatory effects of EMD on tissue regeneration are mediated by the up-regulation of local mediators released by osteoblasts.

Donadio M, Jiang J, **Safavi KE**, Zhu Q. **Cytotoxicity evaluation of Activ GP and Resilon cones in vitro.** Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2008 Jul;106(1):e76-9.

OBJECTIVE: This study was done to evaluate the cytotoxicity of Activ GP and Resilon cones in an in vitro cell culture system. **STUDY DESIGN:** Gutta-percha (GP), Activ GP, and Resilon cones were tested in this study. L929 cells were seeded into 96-well plates at 3×10^4 cells/well. In one set of experiments, 2-mm segments cut from the tip of GP and Resilon cones were placed into the cell culture wells and incubated for 1, 2, and 3 days. In another set of experiments, 20-mm segments of GP, Activ GP, and Resilon cones were incubated in 2 mL cell culture medium for 1 week. Then 100 microL elutes were tested for 24 and 48 h. Cell viability was evaluated by MTT assay. Data were analyzed using 1-way analysis of variance. **RESULTS:** When GP, Activ GP, and Resilon segments were placed into cell cultures, cell viability in the Resilon group was significantly greater than in the GP and Activ GP groups at any test time. There was no cell viability difference between the Activ GP and GP groups. When the elutes of GP, Activ GP, and Resilon was placed into cell cultures, the results were the same as using segments of the tested material. The cytotoxicity of GP and Activ GP is greater than that of the Resilon cone. There was no cell

viability difference between Activ GP and regular GP. CONCLUSION: Resilon has better biocompatibility than regular GP and Activ GP cones. The cytotoxicity of Activ GP is similar to that of regular GP.

Fahid FS, Jiang J, Zhu Q, Zhang C, Filbert E, **Safavi KE**, Spångberg LS. **Application of small interfering RNA for inhibition of lipopolysaccharide-induced osteoclast formation and cytokine stimulation.** J Endod. 2008 May;34(5):563-9. Epub 2008 Mar 19.

RNA interference (RNAi) is a unique and powerful tool used for the study of gene function by suppressing its expression. Nuclear factor of activated T cells (NFATc1) is the most strongly induced transcription factor mediated by receptor activator for nuclear factor kappa B ligand stimulation and has shown to be a key regulator of osteoclastogenesis. To determine the application of small interfering RNA (siRNA) for inhibition of lipopolysaccharide (LPS)-induced cytokine stimulation and osteoclast formation, murine monocyte, RAW 264.7 cells as well as differentiated osteoclasts were transfected with NFATc1-specific siRNA and then stimulated with 100 ng/mL LPS. By using real-time polymerase chain reaction analysis and enzyme-linked immunosorbent assay, we confirmed that monocytes whose NFATc1 protein expression was silenced by using RNAi produced lower levels of inflammatory cytokines, fewer numbers evolved into mature osteoclasts, and osteoclasts expressed lower levels of osteoclast-specific gene markers such as tartrate-resistant acid phosphatase and cathepsin K. These results suggested that RNAi could be used to modulate the effects of LPS stimulation.

Garber SE, **Shabahang S**, Escher AP, **Torabinejad M**. **The effect of hyperglycemia on pulpal healing in rats.** J Endod. 2009 Jan;35(1):60-2. Epub 2008 Nov 4.

Diabetes mellitus (DM) may impede healing of dental pulps. In this study, the effect of hyperglycemia on pulpal healing was determined in exposed rat pulps capped with mineral trioxide aggregate. Two groups of 11 rats received injections of saline (control group) or streptozotocin to induce hyperglycemia (DM group). The pulps of the maxillary first molars of all rats were exposed and capped. Intact teeth and teeth with exposed pulps without restorations served as positive and negative controls, respectively. Histologic samples were prepared and evaluated for dentin bridge formation and pulpal inflammation. Data were analyzed by using Fisher exact, Mann-Whitney U, and Spearman correlation tests. Dentin bridge formation was inhibited in diabetic rats ($p = 0.029$) along with more inflammation in these pulps ($p = 0.005$). There was an inverse association between dentin bridge formation and inflammatory cell infiltration ($p = 0.001$). Based on these results, it appears that hyperglycemia adversely affects pulpal healing in rats.

Shabahang S, Aslanyan J, **Torabinejad M**. **The substitution of chlorhexidine for doxycycline in MTAD: the antibacterial efficacy against a strain of Enterococcus faecalis.** J Endod. 2008 Mar;34(3):288-90.

The antimicrobial effect of MTAD has been largely attributed to the presence of doxycycline. In the present study, chlorhexidine was added to or substituted for doxycycline to compare these three formulations in their ability to disinfect extracted human teeth infected with *Enterococcus faecalis*. Ten teeth were used in each group along with positive and negative controls. The teeth were treated according to previously published protocols. None of the samples treated with MTAD or MTAD + chlorhexidine showed the presence of residual bacteria. In contrast, 7 of 10 samples treated with MCAD (chlorhexidine substituted for doxycycline) showed positive cultures of *E. faecalis*. The results

clearly showed that although the addition of chlorhexidine did not negatively impact the efficacy of MTAD, the substitution of this antimicrobial agent for doxycycline significantly reduces the efficacy of the solution.

Nezafati S, **Shahi S**. **Removal of broken dental needle using mobile digital C-arm.** J Oral Sci. 2008 Sep;50(3):351-3.

Breakage of needles is one of the most frustrating and distressing complications of local anesthesia. It is also one of the easiest to prevent. This article describes the use of the C-arm digital fluoroscope for retrieval of a broken dental needle from the pterygomandibular space.

Torabinejad M, Lozada J, Puterman I, White SN. **Endodontic therapy or single tooth implant? A systematic review.** J Calif Dent Assoc. 2008 Jun;36(6):429-37.

Should a tooth with pulpal involvement be saved through endodontic therapy, or extracted and replaced with a single tooth implant? Within the limitations of the existing literature, this systematic review of treatment outcomes found that initial endodontic treatment had a high long-term survival rate, equivalent to replacement of a missing tooth with an implant-supported restoration. Single tooth implants should be considered as the first treatment option for patients requiring extraction and tooth replacement

Yazdi KA, Sabeti M, Jabalameli F, Eman eini M, **Kolahdouzan SA**, Slots J. **Relationship between human cytomegalovirus transcription and symptomatic apical periodontitis in Iran.** Oral Microbiol Immunol. 2008 Dec;23(6):510-4.

BACKGROUND/AIMS: Apical periodontitis of endodontic origin may develop as a result of cooperative interactions among herpesviruses, specific pathogenic bacteria and tissue-destructive inflammatory mediators. This study sought to identify the presence of Epstein-Barr virus (EBV) and human cytomegalovirus (HCMV) transcripts in symptomatic and asymptomatic periapical lesions of individuals living in Iran. MATERIAL AND METHODS: Fifty endodontic patients (28 with symptomatic periapical lesions and 22 with asymptomatic periapical lesions) were included in the study. In each study subject, a microbiological periapical sample was collected using a curette in conjunction with periapical surgery. A reverse transcription-polymerase chain reaction assay was used to identify transcripts of EBV and HCMV. RESULTS: Human cytomegalovirus transcript was detected in 15 of the 28 (53.6%) symptomatic and in six of the 22 (27.3%) asymptomatic periapical study lesions (significant difference between symptomatic and asymptomatic lesions; $P = 0.03$, chi-square test). Epstein-Barr virus transcript was identified in one symptomatic and in two asymptomatic periapical lesions. CONCLUSION: This study establishes that HCMV transcription is common in apical periodontitis and is most frequent in symptomatic lesions. The high frequency of active herpesvirus infections in severe apical periodontitis changes the pathogenic paradigm of the disease and may also have preventive and therapeutic implications.

Zand V, **Lotfi M**, Vosoughosseini S. **Proliferative periostitis: a case report.** J Endod. 2008 Apr;34(4):481-3. Epub 2008 Feb 7.

Proliferative periostitis of Garré represents a periosteal reaction to the presence of infection or other irritants. This can be odontogenic or nonodontogenic. This is a case report of an odontogenic periostitis resulting from endodontic origin. It was successfully treated by nonsurgical root canal therapy without using antibiotic therapy during the treatment of this case.