Restorative Dentistry
Current Awareness Newsletter
JANUARY 2016
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<table>
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<tr>
<th>Lunchtime Drop-in Sessions</th>
<th>January (1pm)</th>
<th>February (12pm)</th>
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**Literature Searching**

An in-depth guide to formulating an effective search strategy and getting the most out of searching key healthcare databases.

**Understanding Articles**

How to assess the strengths and weaknesses of research methods.

Examining different research designs, bias and validity, and frameworks for systematically appraising a medical paper.

**Medical Statistics**

A basic introduction to the key statistics in medical articles.

Giving an overview of statistics that compare risk, test confidence, analyse clinical investigations, and test difference.

**Information Resources**

A comprehensive overview of Library subscription resources, freely available online resources and ‘grey literature’.
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- Haematology
- Hospital Medicine
- Infectious diseases
- Nephrology and hypertension
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Medication-related osteonecrosis of the jaw in patients with cancer

Authors: James R Berenson, MD; Alison T Stopeck, MD

Literature review current through: Dec 2015. | This topic last updated: Aug 18, 2015.

INTRODUCTION — Osteonecrosis of the jaw (ONJ), which was first described in 2002 [1], is a relatively uncommon but potentially serious side effect of treatment with antiresorptive agents such as intravenous (IV) high potency bisphosphonates (image 1) and denosumab, which decrease the risk of skeletal-related events (SREs) in patients with cancer and metastatic bone disease. The increased dose intensity of anti-resorptive therapy typically prescribed for cancer indications places cancer patients at a substantially higher risk for ONJ than are patients who receive them for other conditions such as osteoporosis and Paget’s disease [2-5].

ONJ has also been described as a complication of cancer therapies that target angiogenesis; however, this association is more controversial with little confirmatory prospective trial data available in the setting of monotherapy with an antiangiogenic agent alone. Use of antiangiogenic agents is clearly a risk factor for medication-related ONJ (MRONJ) among patients receiving antiresorptive agents for cancer.

This topic review will describe the incidence, risk factors, staging, clinical course, prevention strategies, and management of MRONJ in patients with cancer who are receiving antiresorptive agents. The incidence, risk factors, and management strategies for MRONJ in patients receiving antiresorptive therapy for osteoporosis and other side effects associated with bisphosphonates and denosumab in patients with cancer are addressed elsewhere.
New from the Dental Elf

Crowns more effective than fillings for decay in primary molar teeth

http://www.nationalelfservice.net/dentistry/caries/crowns-more-effective-than-fillings-for-decay-in-primary-molar-teeth/

Jan 6 2016

Globally dental caries affects 60-90% of children, most commonly in primary molar teeth. If this is not managed it can lead to pain and infection and impact on ability to grow and thrive. The aim of this review was to evaluate the clinical effectiveness and safety of all types of pre-formed crowns for restoring primary teeth compared with conventional filling materials (such as amalgam, composite, glass ionomer cement, resin-modified glass ionomer, and compomers), other types of crowns or methods of crown placement and non-restorative caries treatment or no treatment.

Atherosclerosis and periodontal disease is there an association?

http://www.nationalelfservice.net/dentistry/periodontal-disease/atherosclerosis-and-periodontal-disease-is-there-an-association

Dec 18 2015

Atherosclerosis is a chronic inflammatory disease of the arterial wall and an underlying cause of a number of cardiovascular diseases (CVDs) e.g. coronary artery disease (CAD), peripheral arterial disease and stroke, contributing to morbidities and mortalities worldwide. A number of studies have linked atherosclerosis with periodontal disease so the aim of this review was to evaluate the association between periodontal disease and carotid atherosclerosis.

Top Dental Elf Blogs of 2015


Jan 4 2016

During 2015 we published 200 dental health blogs. Covering a wide range of topics. Our most popular blogs each month are listed below. One of the most popular was our November blog on eating disorders and oral health, which was published jointly with the Mental Elf. Highlights included the long awaited Cochrane Review of water fluoridation and the update of the NICE guidance on Infective endocarditis.
Current Awareness Database Articles on Restorative Dentistry

Below is a selection of articles on restorative dentistry recently added to the healthcare databases, grouped in the following categories:

- Peri-implantitis
- Bisphosphonate-related osteonecrosis of the jaw
- Dental-related cleft lip and palate
- Periodontal disease and antibiotics
- Dental-related head and neck oncology
- Dental implants

If you would like any of the following articles in full text, or if you would like a more focused search on your own topic, then get in touch: library@uhbristol.nhs.uk

Peri-implantitis

**Title:** A Regenerative Approach to the Successful Treatment of Peri-implantitis: A Consecutive Series of 170 Implants in 100 Patients with 2- to 10-Year Follow-up.

**Citation:** International Journal of Periodontics & Restorative Dentistry, 2015, vol./is. 35/6(857-863)

**Title:** Adherence of oral streptococci to nanostructured titanium surfaces.

**Citation:** Dental materials : official publication of the Academy of Dental Materials, Dec 2015, vol. 31, no. 12, p. 1460-1468 (December 2015)

**Author(s):** Narendrakumar, Krunal, Kulkarni, Mukta, Addison, Owen, Mazare, Anca, Junkar, Ita, Schmuki, Patrik, Sammons, Rachel, Iglič, Aleš

**Abstract:** Peri-implantitis and peri-mucositis pose a severe threat to the success of dental implants. Current research focuses on the development of surfaces that inhibit biofilm formation while not inferring with tissue integration. This study compared the adherence of two oral bacterial species, Streptococcus sanguinis and Streptococcus mutans to nanostructured titanium surfaces. The samples included TiO2 nanotubes formed by anodization of titanium foil of 100, 50 and 15nm diameter (NT15, NT50, NT100), a nanoporous (15nm pore diameter) surface and compact TiO2 control. Adherent surviving bacteria were enumerated after 1h in an artificial saliva medium containing bovine mucin. Lowest numbers of adherent bacteria of both species were recovered from the original titanium foil and nanoporous surface and highest numbers from the Ti100 nanotubes.
Numbers of attached S. sanguinis increased in the order (NT15<NT50<NT100), correlated with increasing percentage of surface fluoride. The lowest adhesion of S. sanguinis and S. mutans on TiO2 nanostructured surfaces was observed for small diameter nanoporous surfaces which coincides with the highest osteoblast adhesion on small diameter nanotubular/nanoporous surfaces shown in previous work. This study indicates that the adherence of oral streptococci can be modified by titanium anodization and nanotube diameter.

Title: Autoinflammation Around AES Total Ankle Replacement Implants.

Citation: Foot & ankle international, Dec 2015, vol. 36, no. 12, p. 1455-1462

Author(s): Koivu, Helka, Takakubo, Yuya, Mackiewicz, Zygmunt, Al-Samadi, Ahmed,

Abstract: Failure of total ankle replacement (TAR) can be characterized by early peri-implant osteolysis even in the presence of very modest numbers of wear particles. The hypothesis of the study was that this reaction is in part mediated by autoinflammatory responses mediated via damage-associated molecular patterns (DAMPs, danger signals) and pattern-recognizing danger signal receptors (PRRs). Peri-implant tissue and control samples from 10 patients with AES implants were immunostained for hypoxia inducible factor-1α (HIF-1α), activated caspase-3, high-mobility group box 1 (HMGB1), receptor for advanced glycation end product (RAGE), and toll-like receptors TLR2 and TLR4. Results were evaluated on a 0 to 4 scale (from 0% to >50% stained area). Peri-implant tissue around failed TAR implants had a relatively high mean HIF-1α score of 3 on a scale, which however was similar in control samples. HMGB1 (a DAMP) was seen to be mobilized from nuclei to cellular cytoplasm, and the active caspase-3(+) cells were increased. All PRRs were increased in revision samples. Increased expression of HMGB1 and other danger signals together with increased PRR-dependent responsiveness could contribute to autoinflammatory peri-implantitis, multilocular cyst formation, and osteolysis in failed TAR implants. Level IV, case series.

Title: Incidence of peri-implantitis and oral quality of life in patients rehabilitated with implants with different neck designs: A 10-year retrospective study.

Citation: Journal of cranio-maxillo-facial surgery : official publication of the European Association for Cranio-Maxillo-Facial Surgery, Dec 2015, vol. 43, no. 10, p. 2168-2174

Author(s): Sánchez-Siles, M, Muñoz-Cámara, D, Salazar-Sánchez, N, Ballester-Ferrandis, J F,

Abstract: To evaluate peri-implant bone loss, the presence of peri-implantitis, aesthetic satisfaction, and quality of life in patients with implant-based prosthetic restorations using implants with or without smooth necks, placed in different bone positions. 400 patients received 1,244 implants: 515 with smooth neck monitored over an average of 6.44 ± 2.55 years and 729 without smooth neck monitored over 5.61 ± 2.52 years. Radiographic bone loss, presence of periimplantitis, implant loss, quality of life (OHIP-14), and patient satisfaction with prosthetic esthetics were evaluated, comparing groups. 120 implants developed peri-implantitis, 15 with a 2.5 mm smooth neck and 105 without smooth neck. Patients without smooth-necked implants showed a worse quality of life with statistically
significant difference (p < 0.001). Patient satisfaction with prostheses was higher among the group without smooth neck. Implants with smooth polished necks would appear to suffer less bone loss and peri-implantitis, and lead to better patient quality of life. However, implants without smooth necks placed crestally led to higher patient satisfaction with aesthetics.

**Title:** The effect of orally administered probiotic Lactobacillus reuteri-containing tablets in peri-implant mucositis: a double-blind randomized controlled trial.

**Citation:** Journal of periodontal research, Dec 2015, vol. 50, no. 6, p. 775-785

**Author(s):** Flichy-Fernández, A J, Ata-Ali, J, Alegre-Domingo, T, Candel-Martí, E, Ata-Ali, F,

**Abstract:** Probiotics create a biofilm and protect the oral tissues against the action of periodontal pathogenic bacteria. The aim of this study was to evaluate the effects of the oral probiotic Lactobacillus reuteri Prodentis upon the peri-implant health of edentulous patients with dental implants and peri-implant mucositis, establishing comparisons vs implants without peri-implant disease. A double-blind, placebo-controlled, prospective cross-over study was made. The patients were all edentulous and were divided into two groups, (A) no peri-implant disease, and (B) peri-implant mucositis affecting one or more implants. Patients with peri-implantitis were excluded. The dosage was one tablet every 24 h over 30 d. All patients in both groups initially received the oral probiotic Lactobacillus reuteri Prodentis, followed by placebo. Patients started with probiotic treatment during 30 d, followed by a 6 mo washout period and the administration of placebo for the same period. The following parameters were studied: crevicular fluid volume, modified plaque index, probing depth, modified gingival index, and concentrations of interleukin 1β, interleukin 6 and interleukin 8. A total of 77 implants were evaluated in 34 patients. Group A involved 22 patients with 54 implants without peri-implant alterations, and group B, 12 patients with mucositis affecting one or more implants (23 implants). After treatment with the probiotic, both the patients with mucositis and the patients without peri-implant disease showed improvements in the clinical parameters, with reductions in cytokine levels. In contrast, no such changes were observed with placebo. After treatment with the probiotic Lactobacillus reuteri in patients with implants presenting mucositis, the clinical parameters improved, and the cytokine levels decreased - in contraposition to the observations in the placebo group. Probiotic administration may be regarded as a good alternative for both the treatment of peri-implant mucositis and its prevention, as it also improved clinical parameters in the healthy individuals. Further studies involving larger patient series are needed regarding the effects of probiotics upon peri-implant health. © 2015 John Wiley & Sons A/S. Published by John Wiley & Sons Ltd.

**Title:** A History of Periodontitis Suggests a Higher Risk for Implant Loss.

**Citation:** The journal of evidence-based dental practice, Dec 2015, vol. 15, no. 4, p. 185-186

**Author(s):** Chrcanovic, Bruno Ramos

Bisphosphonate-related osteonecrosis of the jaw

Title: Animal model for medication-related osteonecrosis of the jaw with precedent metabolic bone disease.

Citation: Bone, Dec 2015, vol. 81, p. 442-448 (December 2015)

Author(s): Kim, Jin-Woo, Tatad, Jacquiline Czar I, Landayan, Maria Erika A, Kim,

Abstract: Despite the fact that the medications used to treat abnormal bone conditions often induce osteonecrosis of the jaw (ONJ), previous attempts to establish an animal model for ONJ have shown insufficient consideration for this important prerequisite for the development of the disease. The purpose of this study was to establish an animal model with the most common metabolic bone disease, osteoporosis. Ninty-six rats were randomly divided into ovariectomy (Ov) group (n=48) and sham-operated group (n=48). Six weeks after Ov or sham surgery, rats in each group were subdivided into bisphosphonate group (n=36 each) and control group (n=12 each) and injected with zoledronic acid and normal saline, respectively, once a week. After additional 6 weeks, surgical intervention was performed, and the injections were continued for 8 more weeks. The animals were then sacrificed for further macroscopic, histological, histomorphometric, radiological, and bone biomarker investigations. As histologically determined, the Ov group (77.8%) showed higher ONJ prevalence compared to the sham group (47.2%; P<0.05). Micro-structural and histomorphometric assessments revealed that rats with ONJ (ONJ group) presented with deteriorated bone architectures with higher necrotic bone fraction and lower number of osteoclasts (P<0.05). Compared to the sham-operated ONJ group, the Ov ONJ group showed significantly lower values of Tb.N, Tb.Sp, Conn.D, N.Oc/T.Ar, and TRACP 5b and CTX/TRACP (P<0.05). The ovariectomized rat model in this study successfully mimicked human ONJ lesions with an underlying bone disease and showed different bone characteristics than that of the previous ONJ model. Based on the differences, further researches for investigating pathophysiology of ONJ, including various pharmacological responses for deteriorated bone environment, are required. Copyright © 2015 Elsevier Inc. All rights reserved.

Title: Impact of Osteonecrosis of the Jaw on Osteoporosis Treatment in Japan: Results of a Questionnaire-Based Survey by the Adequate Treatment of Osteoporosis (A-TOP) Research Group.
**Abstract:** Dentists request a discontinuation of antiresorptive agents, such as bisphosphonate, before and after tooth extractions to prevent osteonecrosis of the jaw (ONJ). However, little is known about how this affects ONJ and osteoporosis treatment and how medical professionals and dentists cooperate to treat ONJ in patients with osteoporosis. This study aimed to clarify the impact of ONJ on osteoporosis treatment in Japan. A structured questionnaire including 14 key clinical queries was sent to 488 medical professionals as part of the Japanese Osteoporosis Intervention Trial (JOINT)-04, and 206 responses were received. A total of 173 respondents had received discontinuation requests from dentists. Of these, 28 respondents experienced 30 adverse events including ten fractures and one incidence of ONJ. The respondents who refused discontinuation requests observed no cases of ONJ. Approximately 16% of respondents had patients who discontinued osteoporosis treatment, following a requested drug discontinuation, after tooth extraction. Dentists requested discontinuations for many medications that were not associated with the incidence of ONJ. Approximately 76% of respondents had never requested oral health care from dentists before osteoporosis treatment and 72% reported no cooperation between dentists and medical professionals in their region. Our results suggest that drug discontinuation may increase adverse events and disturb osteoporosis treatment without completely preventing ONJ. Currently, both medical professionals and dentists in Japan still continue to recommend their own treatment position. A forum to share information about ONJ among medical professionals, dentists, and patients is required.

**Title:** Bisphosphonate drug holidays - when, why and for how long?

**Abstract:** Bisphosphonates are first-line agents used for the treatment of osteoporosis in postmenopausal women and men. Although their efficacy in the reduction of vertebral, non-vertebral and hip fracture risk has been established, some concerns have arisen associated with their long-term use. These include osteonecrosis of the jaw and atypical (subtrochanteric and femoral shaft) fractures. The latter may result from accumulation of fatigue damage due to oversuppression of bone turnover in susceptible individuals. In this respect, the concept of a 'drug holiday' after completion of a reasonable period of bisphosphonate therapy has emerged. Theoretically, this allows bone turnover to increase and permits normal skeletal maintenance and repair, although there is as yet no good evidence that bisphosphonate discontinuation will reduce the risk of these adverse events. Current data derive from studies in postmenopausal women and support a beneficial effect of alendronate or zolendronate continuation in high-risk groups, such as those with T-score < -2.5 or prevalent vertebral fractures after completion of 5 or 3 years, respectively. The optimal length of a 'drug holiday' has not been established but existing data suggest up to 5
years with alendronate, 3 years with zoledronate and 1 year with risedronate. A decision to recommence therapy should then probably be based on regular reassessment of bone mineral density and fracture risk.

Title: Administration of teriparatide improves the symptoms of advanced bisphosphonate-related osteonecrosis of the jaw: preliminary findings.

Citation: International journal of oral and maxillofacial surgery, Dec 2015, vol. 44, no. 12, p. 1558-1564 (December 2015)


Abstract: Teriparatide is a synthetic polypeptide hormone that contains the 1-34 amino acid fragment of the recombinant human parathyroid hormone that stimulates bone formation. Currently, it is approved only for the treatment of osteoporosis. The outcomes of daily teriparatide injections for the treatment of bisphosphonate-related osteonecrosis of the jaw in 10 patients are reported here. Two of the 10 cases dropped out due to adverse events. Of the remaining eight cases, seven exhibited clinical improvement of the jaw-related symptoms of osteonecrosis and progression of the sequestration, while one case did not show improvement of the symptoms. Administration of teriparatide in patients with osteonecrosis of the jaw promotes bone formation and subsequent sequestration over a short period of time. These results suggest that adjunctive teriparatide therapy is a viable and effective option for treating osteonecrosis of the jaw. Copyright © 2015 International Association of Oral and Maxillofacial Surgeons. Published by Elsevier Ltd. All rights reserved.

Title: Knowledge and attitudes of Brazilian dental students and dentists regarding bisphosphonate-related osteonecrosis of the jaw.

Citation: Supportive care in cancer : official journal of the Multinational Association of Supportive Care in Cancer, Dec 2015, vol. 23, no. 12, p. 3421-3426 (December 2015)

Author(s): de Lima, Paula Baptistella, Brasil, Veruska Lima Moura, de Castro, Jurema Freire Lisboa, de Moraes Ramos-Perez, Flávia Maria, Alves, Fábio Abreu, Dos Anjos Pontual, Maria Luiza, da Cruz Perez, Danyel Elias

Abstract: The aim of this study was to evaluate the knowledge of Brazilian dentists (DEN) and dental students (DS) about bisphosphonates (BP) and bisphosphonate-related osteonecrosis of the jaw (BRONJ). A convenience sample of 104 DEN and 100 DS was randomly selected and invited to answer a questionnaire. The questionnaire was structured on the basis of the main information about BP and the risk factors associated with the development of BRONJ. The data obtained were analyzed by the chi-square and Fisher’s exact tests, considering significance of 5 %. Seventy-five (72.1 %) DEN and 75 (75 %) DS did not know the BP cited in the questionnaire (p < 0.0001), and their commercial brand names were not recognized by 88 (84.6 %) DEN and 86 (86 %) DS (p < 0.0001). In the same way, 62 (59.6 %) DEN (p = 0.04) and 58 (58 %) DS (p < 0.0001) did not recognize BRONJ as an oral side effect of BP or point out oral conditions that were not associated with the use of BP.
Practical initiatives, such as free lectures and workshops, must be taken to broaden the knowledge of DEN and DS about BP and thus contribute to the prevention of BRONJ.

Cleft lip and palate

Title: Transverse dental arch relationship at 9 and 12 years in children with unilateral cleft lip and palate treated with infant orthopedics: a randomized clinical trial (DUTCHCLEF).

Citation: Clinical oral investigations, Dec 2015, vol. 19, no. 9, p. 2255-2265 (December 2015)

Author(s): Noverraz, R L M, Disse, M A, Ongkosuwito, E M, Kuijpers-Jagtman, A M, Prahl, C

Abstract: A long-term evaluation to assess the transverse dental arch relationships at 9 and 12 years of age in unilateral cleft lip and palate treated with or without infant orthopedics (IO). The hypothesis is that IO has no effect on the transverse dental arch relationship. A prospective two-arm randomized controlled trial (DUTCHCLEF) in three academic cleft palate centers (Amsterdam, Nijmegen and Rotterdam, the Netherlands). Fifty-four children with complete unilateral cleft lip and palate and no other malformations were enrolled in this evaluation. One group wore passive maxillary plates (IO+) during the first year of life, and the other group did not (IO-). Until the age of 1.5, all other interventions were the same. Hard palate was closed simultaneously with bone grafting according to protocol of all teams. Orthodontic treatment was performed when indicated. The transverse dental arch relationship was assessed on dental casts using the modified Huddart/Bodenham score to measure the maxillary arch constriction at 9 and 12 years of age. No significant differences were found between the IO+ and IO- groups. Differences between the centers increased from 9 to 12 years of age. Transverse dental arch relationships at 9 and 12 years of age do not differ between children with UCLP treated with or without IO. There is no orthodontic need to perform IO as applied in this study in children with UCLP.

Title: Disrupting the intrinsic growth potential of a suture contributes to midfacial hypoplasia.

Citation: Bone, Dec 2015, vol. 81, p. 186-195 (December 2015)

Author(s): Li, Jingtao, Johnson, Chelsey A, Smith, Andrew A, Salmon, Benjamin, Shi, Bing

Abstract: Children with unoperated cleft palates have nearly normal growth of their faces whereas patients who have had early surgical repair often exhibit midfacial hypoplasia. Surgical repair is responsible for the underlying bone growth arrest but the mechanisms responsible for these surgical sequelae are poorly understood. We simulated the effect of cleft palate repair by raising a mucoperiosteal flap in the murine palate. Three-dimensional micro-CT reconstructions of the palate along with histomorphometric measurements, finite element (FE) modeling, immunohistochemical analyses, and quantitative RT-PCR were employed to follow the skeletal healing process. Inflammatory bone resorption was observed during the first few days after denudation, which destroyed the midpalatal suture complex. FE modeling was used to predict and map the distribution of strains and their...
associated stresses in the area of denudation and the magnitude and location of hydrostatic and distortional strains corresponded to sites of skeletal tissue destruction. Once re-epithelialization was complete and wound contracture subsided, the midpalatal suture complex reformed. Despite this, growth at the midpalatal suture was reduced, which led to palatal constriction and a narrowing of the dental arch. Thus the simple act of raising a flap, here mimicked by denuding the mucoperiosteum, was sufficient to cause significant destruction to the midpalatal suture complex. Although the bone and cartilage growth plates were re-established, mediolateral skeletal growth was nonetheless compromised and the injured palate never reached its full growth potential. These data strongly suggest that disruption of suture complexes, which have intrinsic growth potential, should be avoided during surgical correction of congenital anomalies.

Title: Maxillary dental anomalies in patients with cleft lip and palate: a cone beam computed tomography study

Citation: The Journal of clinical pediatric dentistry, December 2015, vol./is. 39/2(183-186),

Author(s): Celikoglu M., Buyuk S.K., Sekerci A.E., Cantekin K., Candirli C.

Abstract: OBJECTIVE: To compare the frequency of maxillary dental anomalies in patients affected by unilateral (UCLP) and bilateral (BCLP) cleft lip with palate and to determine whether statistical differences were present or not between cleft and normal sides in UCLP group by using cone beam computed tomography (CBCT). In addition, the frequency of those dental anomalies was compared with previous studies presenting the same population without cleft Study Design: Fifty non-syndromic patients affected by UCLP (28 patients) and BCLP (22 patients) were selected for analysis of dental anomalies by means of CBCT. The frequency of maxillary dental anomalies including tooth agenesis, microdontia of lateral incisor, ectopic eruption and impaction of canine and supernumerary tooth were examined. Pearson chi-square and Fisher’s exact tests were performed for statistical comparisons.RESUL...
Title: Taurodontism in patients with nonsyndromic cleft lip and palate in a Brazilian population: a case control evaluation with panoramic radiographs.

Citation: Oral surgery, oral medicine, oral pathology and oral radiology, Dec 2015, vol. 120, no. 6, p. 744-750 (December 2015)

Author(s): Melo Filho, Mario Rodrigues, Nogueira Dos Santos, Luis Antônio, Barbosa Martelli, Daniella Reis, Silveira, Marise Fagundes, Esteves da Silva, Myrian, de Barros, Letízia Monteiro, Coletta, Ricardo D, Martelli-Júnior, Hercílio

Abstract: The purpose of this study was to evaluate the prevalence of taurodontism in patients with nonsyndromic cleft lip and palate (NSCLP) within a Brazilian population. The study was designed as an epidemiologic case-control single-center study. Three hundred eighty-eight patients were included: 88 had NSCLP, and 300 comprised the control group. The first and second permanent mandibular molars were included in this study. By using panoramic radiographs, taurodontism was categorized as mesotaurodontism, hypotaurodontism, and hypertaurodontism. Seventy patients (23.3%) from the control group and 36 patients (40.9%) from the case group presented taurodontism (P < .001). In the control group, 108 (9%) teeth showed taurodontism, whereas in the case group with cleft lip and palate (CLP), 64 (18.2%) teeth showed dental anomalies (P < .001). In both groups, most taurodontic teeth presented hypotaurodontism, followed by mesotaurodontism, while hypertaurodontism was found in only two teeth. The probability of taurodontism in patients with cleft lip (CL) was 2.36 (P = .010) times higher compared with those with CLP, whereas the occurrence of taurodontism in patients with cleft palate (CP) was 3.15 (P = .002) times greater than in patients with CLP. The results from this study indicate a close relationship between taurodontism and NSCLP and the possibility of different cleft subphenotypes. Copyright © 2015 Elsevier Inc. All rights reserved.

Title: The frequency of non-syndromic distomolar teeth in a Greek population sample?

Citation: Journal of clinical and experimental dentistry, Dec 2015, vol. 7, no. 5, p. e589.

Author(s): Mitsea, Anastasia, Vardas, Emanouel, Papachatzopoulou, Angeliki, Kalfountzos, Georgios, Leventis, Minas, Tsiklakis, Kostas

Abstract: To investigate the frequency of non-syndromic distomolars in a Greek population sample. The study population of this retrospective study consisted of 859 Orthopantomograms (OPGs) of 425 male and 434 female patients, attended the Department of Oral Diagnosis and Radiology, Dental School of Athens seeking for treatment. The OPGs were taken as a part of the patients treatment planning. Patients' mean age was 33.57 years. Exclusion criteria from this study was cleft lip ± palate and diseases associated with systemic conditions and syndromes (such as cleidocranial dysplasia and Gardner syndrome). OPGs were only included in the study if at least one 3rd molar was present. The data collected were the number of 3rd molars, the number of distomolars, the age and the gender of each patient, information concerning previous extraction of 3rd molars. Statistical
evaluation of the data included descriptive and bivariate analyses (Chi-square test and Spearman's rho correlation coefficient). In an attempt to further estimate the correlation between the presence of upper and lower 3rd conditions we assumed that the absence of 3rd molars, the presence of 3rd molars, and the presence of distomolars was ordinal in nature and we calculated the Spearman Correlation Coefficient. The number of distomolars was greater in the maxilla than in the mandible. In the maxilla the distomolars were located almost equally in both left and right side. It was more possible lower left distomolars to be present in males than in females. Furthermore, males present higher prevalence of supernumerary teeth than females. Early radiographic diagnosis of distomolars is fundamental so as to prevent complications such malocclusion, delayed eruption or displacement root or/ and resorption of adjacent teeth, pulp necrosis, follicular cyst, pain. Non syndromic, distomolars, supernumerary molars, fourth molars.

Title: Dental anomalies associated with cleft lip and palate in Northern Finland.

Citation: European journal of paediatric dentistry : official journal of European Academy of Paediatric Dentistry, Dec 2015, vol. 16, no. 4, p. 327-332, 1591-996X (December 2015)

Author(s): Lehtonen, V, Anttonen, V, Ylikontiola, L P, Koskinen, S, Pesonen, P, Sándor, G K

Abstract: Despite the reported occurrence of dental anomalies of cleft lip and palate, little is known about their prevalence in children from Northern Finland with cleft lip and palate. The aim was to investigate the prevalence of dental anomalies among patients with different types of clefts in Northern Finland. Design and Statistics: patient records of 139 subjects aged three years and older (with clefts treated in Oulu University Hospital, Finland during the period 1996-2010 (total n. 183) were analysed for dental anomalies including the number of teeth, morphological and developmental anomalies and their association with the cleft type. The analyses were carried out using Chi-square test and Fisher's exact test. Differences between the groups were considered statistically significant at p values < 0.05. More than half of the patients had clefts of the hard palate, 18% of the lip and palate, and 13% of the lip. At least one dental anomaly was detected in 47% of the study population. Almost one in three (26.6%) subjects had at least one anomaly and 17.9% had two or three anomalies. The most common type of anomaly in permanent teeth were missing teeth followed by supernumerary teeth. Supernumerary teeth were significantly more apparent when the lip was involved in the cleft compared with palatal clefts. Missing teeth were less prevalent among those 5 years or younger. The prevalence of different anomalies was significantly associated with the cleft type in both age groups. Dental anomalies are more prevalent among cleft children than in the general population in Finland. The most prevalent anomalies associated with cleft were missing and supernumerary teeth.

Title: Disrupting the intrinsic growth potential of a suture contributes to midfacial hypoplasia

Citation: Bone, December 2015, vol./is. 81/(186-195), 8756-3282

Author(s): Li J., Johnson C.A., Smith A.A., Salmon B., Shi B., Brunski J., Helms J.A.
Abstract: Children with unoperated cleft palates have nearly normal growth of their faces whereas patients who have had early surgical repair often exhibit midfacial hypoplasia. Surgical repair is responsible for the underlying bone growth arrest but the mechanisms responsible for these surgical sequelae are poorly understood. We simulated the effect of cleft palate repair by raising a mucoperiosteal flap in the murine palate. Three-dimensional micro-CT reconstructions of the palate along with histomorphometric measurements, finite element (FE) modeling, immunohistochemical analyses, and quantitative RT-PCR were employed to follow the skeletal healing process. Inflammatory bone resorption was observed during the first few days after denudation, which destroyed the midpalatal suture complex. FE modeling was used to predict and map the distribution of strains and their associated stresses in the area of denudation and the magnitude and location of hydrostatic and distortional strains corresponded to sites of skeletal tissue destruction. Once re-epithelialization was complete and wound contracture subsided, the midpalatal suture complex reformed. Despite this, growth at the midpalatal suture was reduced, which led to palatal constriction and a narrowing of the dental arch. Thus the simple act of raising a flap, here mimicked by denuding the mucoperiosteum, was sufficient to cause significant destruction to the midpalatal suture complex. Although the bone and cartilage growth plates were re-established, mediolateral skeletal growth was nonetheless compromised and the injured palate never reached its full growth potential. These data strongly suggest that disruption of suture complexes, which have intrinsic growth potential, should be avoided during surgical correction of congenital anomalies.

Title: Oral health-related quality of life before and after crown therapy in young patients with amelogenesis imperfecta

Citation: Health and Quality of Life Outcomes, December 2015, vol./is. 13/1(no pagination), 1477-7525 (December 10, 2015)

Author(s): Pousette Lundgren G., Karsten A., Dahllof G.

Abstract: Background: Amelogenesis imperfecta (AI) is a rare, genetically determined defect in enamel mineralization associated with poor esthetics and dental sensitivity. Because the condition is associated with negative social outcomes, this study evaluated oral health-related quality of life (OHRQoL), dental fear, and dental beliefs before and after early prosthetic crown therapy for AI during adolescence. Methods: The study included 69 patients with AI, aged 6-25 yr: 33 males and 36 females (mean age 14.5 +/- 4.3); healthy controls (n = 80), patients with cleft lip and palate (CLP; n = 30), and patients with molar incisor hypomineralization (MIH; n = 39). All matched in age and gender, and all but the CLP group in socioeconomic area. Patients completed three questionnaires measuring OHRQoL (OHIP-14), dental fear (CFSS-DS), and dental beliefs (DBS-R). Twenty-six patients with severe AI between ages 9 and 22 yr received crown therapy and completed the questionnaires twice: before and after therapy. Results: OHIP-14 scores were significantly higher among patients with AI (7.0 +/- 6.7), MIH (6.8 +/- 7.6) and CLP (13.6 +/- 12.1) than healthy controls (1.4 +/- 2.4) (p < 0.001). After crown therapy, quality of life problems in the 26 patients with severe AI decreased significantly, from 7.8 +/- 6.1 to 3.0 +/- 4.8 (p < 0.001). Early prosthetic therapy did not increase dental fear or negative attitudes toward dental treatment.
Conclusions: OHRQoL increased after early crown therapy in patients with severe AI. Therapy did not increase dental fear or negative attitudes toward dental treatment.

**Periodontal disease and antibiotics**

**Title:** Antimicrobial photodynamic therapy-A discovery originating from the pre-antibiotic era in a novel periodontal therapy.

**Citation:** Photodiagnosis and photodynamic therapy, Dec 2015, vol. 12, no. 4, p. 612-618

**Author(s):** Oruba, Zuzanna, Łabuz, Przemysław, Macyk, Wojciech, Chomyszyn-Gajewska, Maria

**Abstract:** Antimicrobial photodynamic therapy (aPDT) involves pathogens' destruction caused by means of toxic Reactive Oxygen Species (ROS) that are generated upon the interaction of a photoactivatable substance (photosensitizer), light of the appropriate wavelength and oxygen. Among many clinical applications, it is also used as a supplementary method of treatment of periodontal disease. Many in vitro studies confirmed, that a major periopathogenic bacterium, Porphyromonas gingivalis is susceptible to this method. Several animal model studies pointed, that even a single application of aPDT adjunctive to conventional scaling and root planning (SRP) promotes better tissue healing, reduces the inflammatory infiltrate and bone loss. The outcomes of clinical trials are, however, inconsistent. Although in several the superiority of combined treatment protocol (SRP+aPDT) over the conventional (SRP alone) was reported, it was not confirmed in other trials. Nonetheless, the reduction of bleeding indices favoring the combined therapy was observed in the majority of the studies. It indicates, that aPDT has an influence on the extent of inflammation and further studies are needed to establish an optimal protocol of treatment combining mechanical debridement with photochemotherapy in order to obtain good treatment outcomes in our patients. Copyright © 2015 Elsevier B.V. All rights reserved.

**Title:** Plausible Drug Targets in the Streptococcus mutans Quorum Sensing Pathways to Combat Dental Biofilms and Associated Risks.

**Citation:** Indian journal of microbiology, Dec 2015, vol. 55, no. 4, p. 349-356, 0046-8991

**Author(s):** Kaur, Gurmeet, Rajesh, Shrinidhi, Princy, S Adline

**Abstract:** Streptococcus mutans, a Gram positive facultative anaerobe, is one among the approximately seven hundred bacterial species to exist in human buccal cavity and cause dental caries. Quorum sensing (QS) is a cell-density dependent communication process that respond to the inter/intra-species signals and elicit responses to show behavioral changes in the bacteria to an aggressive forms. In accordance to this phenomenon, the S. mutans also harbors a Competing Stimulating Peptide (CSP)-mediated quorum sensing, ComCDE (Two-component regulatory system) to regulate several virulence-associated traits that includes the formation of the oral biofilm (dental plaque), genetic competence and acidogenicity. The QS-mediated response of S. mutans adherence on tooth surface (dental plaque) imparts
antibiotic resistance to the bacterium and further progresses to lead a chronic state, known as periodontitis. In recent years, the oral streptococci, S. mutans are not only recognized for its cariogenic potential but also well known to worsen the infective endocarditis due to its inherent ability to colonize and form biofilm on heart valves. The review significantly appreciate the increasing complexity of the CSP-mediated quorum-sensing pathway with a special emphasis to identify the plausible drug targets within the system for the development of anti-quorum drugs to control biofilm formation and associated risks.

**Title:** Experimental gingivitis, bacteremia and systemic biomarkers: a randomized clinical trial.

**Citation:** Journal of periodontal research, Dec 2015, vol. 50, no. 6, p. 864-869

**Author(s):** Kinane, D F, Zhang, P, Benakanakere, M, Singleton, J, Biesbrock, A, Nonnenmacher, C, He, T

**Abstract:** Bacteremia and systemic inflammatory markers are associated with periodontal and systemic diseases and may be linking mechanisms between these conditions. We hypothesized that in the development of gingival inflammation, systemic markers of inflammation and bacteremia would increase. To study the effect of bacteremia on systemic inflammatory markers, we recruited 80 subjects to participate in an experimental gingivitis study. Subjects were stratified based on gender, smoking and the number of bleeding sites and then randomized to one of two groups: control group (n = 40) or experimental gingivitis group (n = 40). Subjects in the control group conducted an oral hygiene regimen: brushing twice daily with a regular sodium fluoride cavity protection dentifrice and a standard manual toothbrush, flossing twice daily, and mouth rinsing with an anti-cavity fluoride rinse once daily. The experimental group stopped brushing and flossing, and used only the fluoride anti-cavity mouth rinse for 21 d. Seventy-nine of 80 subjects were evaluable. One subject in the control group was excluded from the results due to antibiotic use during the study. Our data showed the experimental gingivitis group exhibited a significant (p < 0.05) increase in dental plaque level and gingival inflammatory indices relative to baseline and the control group but a decrease in bacteremia and soluble intercellular adhesion molecule-1 levels vs. baseline. Bacteremia was negatively correlated with gingival inflammatory indices and soluble intercellular adhesion molecule-1 levels in the experimental gingivitis group, thus negating our hypothesis. We conclude that there are marked differences in systemic cytokine levels over the course of short-term experimentally induced gingivitis and further conclude that a long-term periodontitis study must be considered to address mechanisms whereby oral diseases may affect systemic diseases. © 2015 John Wiley & Sons A/S. Published by John Wiley & Sons Ltd.

**Title:** Non-surgical periodontal therapy with systemic antibiotics in patients with untreated aggressive periodontitis: a systematic review and meta-analysis.

**Citation:** Journal of periodontal research, Dec 2015, vol. 50, no. 6, p. 689-706

**Author(s):** Keestra, J A J, Grosjean, I, Coucke, W, Quirynen, M, Teughels, W
Abstract: The purpose of this meta-analysis is to evaluate the effectiveness of different systemic antibiotics in combination with scaling and root planing (SRP) compared to SRP alone in patients with untreated aggressive periodontitis. In patients with aggressive periodontitis, SRP is often combined with the use of systemic antibiotics. However, the effectiveness of these antibiotics over time and differences in effectiveness between different antibiotics are hardly known. The MEDLINE-PubMed database was searched from their earliest records until January 20, 2014. Several journals were hand searched and some authors were contacted for additional information. The following outcome measures were analysed: mean probing pocket depth reduction, mean clinical attachment level gain and mean bleeding on probing change. Extracted data were pooled using a random effect model. Weighted mean differences were calculated and heterogeneity was assessed. The search yielded 296 abstracts. Ultimately, 101 articles were selected of which 14 articles met the eligibility criteria. Systemic antibiotics showed a significant (p < 0.05) additional pocket depth reduction for moderate (0.36 ± 0.22 mm at 3 mo, 6 mo 0.42 ± 0.22 mm and 12 mo 0.88 ± 0.27 mm) and deep pockets (0.74 ± 0.36 mm at 3 mo, 6 mo 0.85 ± 0.55 mm and 12 mo 1.26 ± 0.81 mm) and a significant clinical attachment gain for moderate (0.26 ± 0.18 at 3 mo, 6 mo 0.52 ± 0.15 and 12 mo 0.83 ± 0.38) and deep pockets (0.59 ± 0.18 at 3 mo, 0.96 ± 0.21 at 6 mo and 1.00 ± 0.80 at 12 mo). For the treatment of patients with aggressive periodontitis, systemic antibiotics combined with non-surgical periodontal therapy resulted in a significant additional effect compared to non-surgical therapy alone. There is a visible trend that showed metronidazole + amoxicillin is the most potent antibiotic combination. © 2014 John Wiley & Sons A/S. Published by John Wiley & Sons Ltd.

Head and neck oncology and dentistry

Title: The role of biofilm in chronic laryngitis and in head and neck cancer.

Citation: Current opinion in otolaryngology & head and neck surgery, Dec 2015, vol. 23, no. 6, p. 448-453

Author(s): Kinnari, Teemu J

Abstract: The importance of bacterial biofilm in the human body, both when associated in chronic infections and as the default mode of microbial growth in the normal flora, has been understood during the last two decades. The word biofilm has recently entered into clinical vocabulary especially in dentistry, and oral hygienists have begun to talk of oral or dental biofilm instead of oral plaque. Biofilm presence has been demonstrated widely in otorhinolaryngology, related to chronic infections of middle ear, paranasal sinuses and lymphoid tissue of adenoids and tonsils and to implanted materials; however, less literature exists considering the implication of biofilm to laryngeal infections or head and neck cancer. The research until now has been mainly descriptive and the mechanisms that lead to biofilm formation are unclear and thus there are limited options for specific treatment of biofilm infection. The focus of this article is to review the recent literature considering the bacterial biofilm in larynx and in head and neck surgery. Bacterial biofilm has now also been implicated in chronic laryngitis. Among head and neck cancer patients, biofilm is the main reason for the short life cycle of indwelling devices such as voice prostheses and tracheal...
tubes. Recently, bacterial biofilm has been related to dysplasia and malignancies both as an aetiological factor and as a source of complications. It has been shown that microbial biofilm is implicated in the mechanisms leading to chronic recalcitrant infections, implant contamination and even to dysplasia. Biofilm has an important role in finding new preventive measures and treatment of these diseases.

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**Title:** A critical assessment of oral care protocols for patients under radiation therapy in the regional University Hospital Network of Madrid (Spain).

**Citation:** Journal of clinical and experimental dentistry, Dec 2015, vol. 7, no. 5, p. e613.

**Author(s):** Lanzós, Isabel, Herrera, David, Lanzós, Eduardo, Sanz, Mariano

**Abstract:** This research was aimed to critically evaluate, under the light of the available scientific evidence, the oral care protocols recommended by different hospitals in head and neck cancer (HNC) patients under radiation therapy. A questionnaire requesting all the relevant information for the oral care of these patients was sent to the 9 University Hospitals in Madrid. The answers were categorized and analyzed. In addition, an electronic search was conducted to identify the most relevant papers (systematic reviews [SR] and randomized clinical trials [RCTs]) assessing oral care protocols for patients treated for HNC with radiation therapy. Eight out of nine centers answered the questionnaire and the retrieved information was tabulated and compared. These recommendations were analyzed by a computerized search on MEDLINE and the Cochrane Oral Health Collaboration Database. The results of the analysis clearly shown a great heterogeneity, in terms of oral health care protocols, regarding the management of irradiated patients (for HNC) within the Hospitals of Madrid region. In addition, some of the recommendations lack solid scientific support. The present survey revealed that the recommendations provided by the different hospitals were clearly different. The available evidence, supported by SR and RCTs, suggested the need of an oral assessment before cancer treatment, in order to prevent and treat dental pathologies and avoiding potential complications; during cancer treatment, it is relevant monitoring the patient in order to decrease the severity of the side effects, and to avoid any tooth extraction or surgery and special attention should be paid to mucositis, xerostomia and candidiasis; after cancer treatment, the following are relevant aspects: the risk of osteoradionecrosis, trismus, caries and the risks associated to dental implants. Head and neck cancer, supportive care in cancer, radiotherapy complications, management and oral care on cancer treatment.

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**Title:** Oral lesions, chronic diseases and the risk of head and neck cancer.

**Citation:** Oral oncology, Dec 2015, vol. 51, no. 12, p. 1082-1087 (December 2015)

**Author(s):** Li, Shuang, Lee, Yuan-Chin Amy, Li, Qian, Chen, Chien-Jen, Hsu, Wan-Lun, Lou, Pen-Jen, Zhu, Cairong, Pan, Jian, Shen, Hongbing, Ma, Hongxia, Cai, Lin, He, Baochang, Wang, Yu, Zhou, Xiaoyan, Ji, Qinghai, Zhou, Baosen, Wu, Wei, Ma, Jie, Boffetta, Paolo, Zhang, Zuo-Feng, Dai, Min, Hashibe, Mia
Abstract: The aim of our study is to explore the role of the history of oral lesions and chronic diseases on the risk of head and neck cancer in a Chinese population. Our case-control study included 921 head and neck cancer cases and 806 controls. We obtained medical history information by administering questionnaires to both cases and controls. We used unconditional logistic regression to estimate odds ratios for oral lesions and chronic conditions. Oral submucous fibrosis (OR=24.24, 95% CI=7.39-79.52), oral leukoplakia (OR=4.05, 95% CI=2.44-6.71) and repetitive dental ulcers (OR=5.12, 95% CI=3.17-8.28) increased the risk of HNC. Depression was associated with HNC risk when adjusted for several covariates (OR=2.10, 95% CI=1.06-4.15), but the association was not statistically significant after adjusting for smoking and alcohol drinking (OR=1.53, 95% CI=0.72-3.25). Also, the crude OR suggested an association between diabetes and HNC risk (OR=1.51, 95% CI=1.09-2.11), but it was not significant after adjusting for confounders. Our study reported on strong associations between HNC risk and oral leukoplakia, oral submucous fibrosis, which is consistent with prior research. We also observed repetitive dental ulcer to be associated with HNC risk. Future studies may focus on studying the association between depression and HNC, using medical records or psychological evaluation results to get more accurate information about depression, with careful assessment of tobacco and alcohol history. Copyright © 2015 Elsevier Ltd. All rights reserved.

Title: Dental demineralization, radiation caries and oral microbiota in patients with head and neck cancer.

Citation: Oral oncology, Dec 2015, vol. 51, no. 12, p. e89.

Author(s): Galvão-Moreira, Leonardo Victor, da Cruz, Maria Carmen Fontoura Nogueir

Title: The application of metal artifact reduction (MAR) in CT scans for radiation oncology by monoenergetic extrapolation with a DECT scanner.

Citation: Zeitschrift für medizinische Physik, Dec 2015, vol. 25, no. 4, p. 314-325

Author(s): Schwahofer, Andrea, Bär, Esther, Kuchenbecker, Stefan, Grossmann, J Günter, Kachelrieß, Marc, Sterzing, Florian

Abstract: Metal artifacts in computed tomography CT images are one of the main problems in radiation oncology as they introduce uncertainties to target and organ at risk delineation as well as dose calculation. This study is devoted to metal artifact reduction (MAR) based on the monoenergetic extrapolation of a dual energy CT (DECT) dataset. In a phantom study the CT artifacts caused by metals with different densities: aluminum (ρAl=2.7g/cm(3)), titanium (ρTi=4.5g/cm(3)), steel (ρsteel=7.9g/cm(3)) and tungsten (ρW=19.3g/cm(3)) have been investigated. Data were collected using a clinical dual source dual energy CT (DECT) scanner (Siemens Sector Healthcare, Forchheim, Germany) with tube voltages of 100kV and 140kV(Sn). For each tube voltage the data set in a given volume was reconstructed. Based on these two data sets a voxel by voxel linear combination was performed to obtain the monoenergetic data sets. The results were evaluated regarding the optical properties of the images as well as the CT values (HU) and the dosimetric consequences in computed
treatment plans. A data set without metal substitute served as the reference. Also, a head and neck patient with dental fillings (amalgam ρ=10g/cm(3)) was scanned with a single energy CT (SECT) protocol and a DECT protocol. The monoenergetic extrapolation was performed as described above and evaluated in the same way. Visual assessment of all data shows minor reductions of artifacts in the images with aluminum and titanium at a monoenergy of 105keV. As expected, the higher the densities the more distinctive are the artifacts. For metals with higher densities such as steel or tungsten, no artifact reduction has been achieved. Likewise in the CT values, no improvement by use of the monoenergetic extrapolation can be detected. The dose was evaluated at a point 7cm behind the isocenter of a static field. Small improvements (around 1%) can be seen with 105keV. However, the dose uncertainty remains of the order of 10% to 20%. Thus, the improvement is not significant for radiotherapy planning. For amalgam with a density between steel and tungsten, monoenergetic data sets of a patient do not show substantial artifact reduction. The local dose uncertainties around the metal artifact determined for a static field are of the order of 5%. Although dental fillings are smaller than the phantom inserts, metal artifacts could not be reduced effectively. In conclusion, the image based monoenergetic extrapolation method does not provide efficient reduction of the consequences of CT-generated metal artifacts for radiation therapy planning, but the suitability of other MAR methods will be subsequently studied. Copyright © 2015. Published by Elsevier GmbH.

Dental implants

Title: Impact of platelet-rich plasma on bone height changes around platform switched implants supporting mandibular overdentures in controlled diabetic patients

Citation: Macedonian Journal of Medical Sciences, December 2015, vol./is. 3/4(no pagination),

Author(s): Ibraheem E.

Abstract: BACKGROUND: The platform switching concept was recently introduced to implant dentistry involving the reduction of restoration abutment diameter with respect to the diameter of dental implant. Long-term follow-up around these implants showed higher levels of bone preservation and proper stress distribution and improved esthetics. AIM: The aim of the present study was to evaluate the changes in bone height by means of radiographic examination around platform switched implant supporting mandibular overdentures in controlled diabetic patients. SUBJECTS AND METHODS: Fourteen male complete edentulous patients were selected and enrolled in a follow-up study plan. Split mouth technique was applied; one side implant chosen randomly with Platelet-rich-plasma (PRP) and the other without PRP, bone height changes was assessed by Cone Beam Computed Tomography (CBCT) radiographic examination after 3 months, 6 months, 9 months and 1 year later. RESULTS: There was increase in bone height loss in both sides but with no statistical significance difference between the two sides after 3 months, 6 months, 9 months and 1 year respectively. CONCLUSION: The result of this article satisfied the patients both esthetically and functionally with recorded increase in bone height loss.
Title: Concomitant correction of a soft-tissue fenestration with keratinised tissue augmentation by using a rotated double-pedicle flap during second-stage implant surgery - a case report

Citation: Journal of Clinical and Diagnostic Research, December 2015, vol./is. 9/12(ZD16-ZD19)

Author(s): Reddy A.A., Anoop Kumar P., Sailaja S., Chakravarthy Y.S.H.S., Chandra R.V.

Abstract: Soft tissue deficiencies and defects around dental implants have been observed frequently. Soft-tissue defects after implant procedures originate from the process of modelling of periimplant mucosa and often cause aesthetic disharmony, food debris accumulation and soft tissue shrinkage. Periimplant mucogingival surgery focuses on creating an optimum band of keratinized tissue resulting in soft tissue architecture similar to the gingiva around natural teeth. A 23-year-old male reported to the Department of Periodontology with a complaint of gum soreness, foul smell and food accumulation at a site where a 3.75 x 11.5mm implant was placed previously. On clinical examination, fenestration of tissue above the cover screw was observed and there appeared to be a keratinized tissue of 1mm surrounding the implant. The case was managed by use of a rotated double-pedicle flap during second-stage implant surgery to correct the soft-tissue fenestration defect and to obtain a keratinized periimplant soft tissue. A periosteal bed was prepared by giving a horizontal incision at the mucogingival junction to a depth of 4 mm. Two split-thickness keratinized pedicles were dissected from the mesial and distal interproximal tissues near the implant. After rotation, both the pedicles were sutured to each other mid-buccally and the pedicles were rigidly immobilized with sutures. At 1 month, there was a 3mm band of stable and firm keratinized tissue over the underlying tissues. The procedure resulted in an aesthetic improvement due to enhanced soft tissue architecture and optimum integration between the peri-implant soft tissue and the final prosthesis.

Title: Analysis of beta-tricalcium phosphate granules prepared with different formulations by nano-computed tomography and scanning electron microscopy

Citation: Journal of Artificial Organs, December 2015, vol./is. 18/4(338-345)

Author(s): Terranova L., Libouban H., Mallet R., Chappard D.

Abstract: Among biomaterials used for filling bone defects, beta-tricalcium phosphate (beta-TCP) is suitable in non-bearing bones, particularly in dental implantology, oral and maxillofacial surgery. When beta-TCP granules are placed in a bone defect, they occupy the void 3D volume. Little is known about the 3D arrangement of the granules, which depends on the nature and size of the granules. The aim of this study was to examine the 3D architecture of porous beta-TCP granules. Granules were prepared with different concentrations of beta-TCP powder in slurry (10, 11, 15, 18, 21, and 25 g of beta-TCP powder in distilled water). Granules were prepared by the polyurethane foam method. They were analyzed by nano-computed tomography (nanoCT) and compared with scanning electron microscopy (SEM). Commercial granules of hydroxyapatite-beta-TCP prepared by the same methodology were also used. The outer and inner architectures of the granules
were shown by nanoCT which evidenced macroporosity, internal porosity and microporosity between the sintered grains. Macroporosity was reduced at high concentration and conversely, numerous concave surfaces were observed. Internal porosity, related to the sublimation of the polyurethane foam, was present in all the granules. Microporosity at the grain joints was evidenced by SEM and on 2D nanoCT sections. Granules presented a heterogeneous aspect due to the different mineralization degree of the sintered powder grains in the beta-TCP granules; the difference between hydroxyapatite and beta-TCP was also evidenced. NanoCT is an interesting method to analyze the fine morphology of biomaterials with a resolution close to synchrotron and better than microcomputed tomography.

**Title:** Thermal effects of lambda = 808 nm GaAlAs diode laser irradiation on different titanium surfaces

**Citation:** Lasers in Medical Science, December 2015, vol./is. 30/9(2341-2352)

**Author(s):** Giannelli M., Lasagni M., Bani D.

**Abstract:** Diode lasers are widely used in dental laser treatment, but little is known about their thermal effects on different titanium implant surfaces. This is a key issue because already a 10 degreeC increase over the normal body temperature can induce bone injury and compromise osseo-integration. The present study aimed at evaluating the temperature changes and surface alterations experienced by different titanium surfaces upon irradiation with a lambda = 808 nm diode laser with different settings and modalities. Titanium discs with surfaces mimicking different dental implant surfaces including TiUnite and anodized, machined surfaces were laser-irradiated in contact and non-contact mode, and with and without airflow cooling. Settings were 0.5-2.0 W for the continuous wave mode and 10-45 μJ, 20 kHz, 5-20 μs for the pulsed wave mode. The results show that the surface characteristics have a marked influence on temperature changes in response to irradiation. The TiUnite surface, corresponding to the osseous interface of dental implants, was the most susceptible to thermal rise, while the machined surfaces, corresponding to the implant collar, were less affected. In non-contact mode and upon continuous wave emission, the temperature rose above the 50 degreeC tissue damage threshold. Scanning electron microscopy investigation of surface alterations revealed that laser treatment in contact mode resulted in surface scratches even when no irradiation was performed. These findings indicate that the effects of diode laser irradiation on implant surfaces depend on physical features of the titanium coating and that in order to avoid thermal or physical damage to implant surface the irradiation treatment has to be carefully selected.

**Title:** CBCT quantitative evaluation of mandibular lingual concavities in dental implant patients

**Citation:** Surgical and Radiologic Anatomy, December 2015, vol./is. 37/10(1209-1215)

**Author(s):** Kamburoglu K., Acar B., Yuksel S., Paksoy C.S.
Abstract: Purpose: The purpose of this study was to evaluate the prevalence of mandibular lingual concavities and to measure them using CBCT (Cone-Beam Computerized Tomography). Methods: In this study, CBCT scans of 200 patients requiring dental implants were assessed for lingual concavities. Reconstructed CBCT images were transferred as DICOM files to the 3D DOCTOR software program, and metric, volumetric, and surface area measurements were obtained. Two-way mixed ANOVA was used to model side (left/right, anterior), measurement type, and gender with side and type taken as within-subject variables, gender as between-subject variables, and age as a covariate. A comparison between the dentate and edentulous groups in the samples with lingual concavities was performed using an unpaired Student’s t test. Results: Submandibular concavity mean depth and volume were found to be 2.4 mm and 130.7 mm$^3$, whereas mean depth and volume of sublingual concavities were found to be 1.3 mm and 26.5 mm$^3$. Significant inverse ratios were found between age and volume and between age and surface area ($p < 0.05$). All measurements were higher in males than females, but the differences were not statistically significant. The differences between the presence of concavity (sublingual, right, and left submandibular) and dental status (dentate/edentulous) were statistically insignificant ($p > 0.05$). Conclusion: Mandibular lingual concavity dimensions were found to vary by age, location, and the presence/absence of teeth. Third party software can be used to generate 3-dimensional models that provide useful information about shape, size, and location of sublingual and submandibular concavities prior to implant placement.

Title: Mucosal CD30-positive T-cell lymphoproliferative disorder arising in the oral cavity following dental implants: Report of the first case

Citation: International Journal of Surgical Pathology, December 2015, vol./is. 23/8(656-661)

Author(s): Yoon H.-J., Choe J.-Y., Jeon Y.K.

Abstract: Mucosal CD30-positive T-cell lymphoproliferative disorder (CD30+ T-cell LPD) is a novel entity with unique clinicopathological features and an indolent behavior. Here we report the first case of mucosal CD30+ T-cell LPD arising in the oral cavity following dental implant. A 70-year-old woman presented with swelling and redness of the oral mucosa of right maxilla and left mandible surrounding dental implants that had been placed 8 years previously. Radiological examination revealed enhancing oral lesions and multiple cervical lymph nodes. Microscopic examination showed diffuse infiltration of large anaplastic cells with characteristic morphology of hallmark cells described in anaplastic large cell lymphoma. These cells were diffusely positive for CD30, CD3, CD4, CD2, CD5, CD7, TIA-1, and TCRbetaF1, but negative for CD20, CD8, CD45, EMA, ALK, and Epstein-Barr virus. T-cell monoclonality was detected in a TCR13 gene rearrangement study. This a unique case of mucosal CD30+ T-cell LPD with unusual presentation following dental implant.

Title: Effects of fluoride-ion-implanted titanium surface on the cytocompatibility in vitro and osseointegration in vivo for dental implant applications

Citation: Colloids and Surfaces B: Biointerfaces, December 2015, vol./is. 136/(752-760),

**Abstract:** As an attractive technique for the improvement of biomaterials, Plasma immersion ion implantation (PIII) has been applied to modifying the titanium material for dental implant application. The present study investigated the cytocompatibility and early osseointegration of fluoride-ion-implanted titanium (F-Ti) surface and implants, both characterizing in their composition of titanium oxide and titanium fluoride. The cytocompatibility of F-Ti was evaluated in vitro by using scanning electron microscope, Cell Counting Kit-8 assay, alkaline phosphatase activity assay, and quantitative real-time polymerase chain reaction. The results showed that the F-Ti weakened the effects that Porphyromonas gingivalis exerted on the MG-63 cells in terms of morphology, proliferation, differentiation, and genetic expression when MG-63 cells and Porphyromonas gingivalis were co-cultured on the surface of F-Ti. Meanwhile, the osteogenic activity of F-Ti implants was assessed in vivo via evaluating the histological morphology and estimating histomorphometric parameters. The analysis of toluidine blue staining indicated that the new bone was more mature in subjects with F-Ti group, which exhibited the Haversian system, and the mean bone-implant contact value of F-Ti group was slightly higher than that of cp-Ti group (p > 0.05). Fluorescence bands were wider and brighter in the F-Ti group, and the intensity of fluorochromes deposited at the sites of mineralized bone formation was significantly higher for F-Ti surfaces than for cp-Ti surfaces, within the 2nd, 3rd and 4th weeks (p < 0.05). An indication is that the fluoride modified titanium can promote cytocompatibility and early osseointegration, thus providing a promising alternative for clinical use.

**Title:** Biocompatibility of antibacterial Ti-Cu sintered alloy: in vivo bone response

**Citation:** Journal of Materials Science: Materials in Medicine, December 2015, vol./is. 26/12(no pagination)

**Author(s):** Bai B., Zhang E., Dong H., Liu J.

**Abstract:** Ti-10Cu sintered alloy has shown very strong in vitro and in vivo antibacterial property and in vitro cell compatibility. In this paper, Ti-10Cu implant (Ti-Cu group) and commercial pure Ti implant (cp-Ti group) were implanted in rabbit femurs to investigate in vivo bone response to the Ti-10Cu alloy. X-ray photo, fluorescent microscopy, routine pathological examination and immunohistochemistry have been used to analyze bone growth, mineral apposition rate (MAR), bone implant contact (BIC), BMP-2 expression and TGF-beta1 expression. In both Ti-Cu and cp-Ti groups, new bone tissue was found at bone/implant interfaces 4 weeks postimplantation and completely filled the interfaces gap bone 12 weeks postimplantation. A significant MOD value in BMP-2 expression was observed at week 1 and week 4 in the Ti-Cu group with lower values of week 2 and 3 in both groups, which indicated strong positive activity. MOD value in TGF-beta1 expression decreased with the extension of implantation. However, no difference can be found in MAR, BIC and TGF-beta1 expression between the two groups at all intervals. It was deduced that Ti-Cu alloy exhibited as good bone response as cp-Ti. The good bone compatibility suggests
that Ti-10Cu alloy might have potential application in orthopedic surgery and dental implant.

Title: Antibacterial nanostructured polyhydroxybutyrate membranes for guided bone regeneration

Citation: Journal of Biomedical Nanotechnology, December 2015, vol./is. 11/12(2253-2263)

Author(s): Karahaliotlu Z., Ercan B., Taylor E.N., Chung S., Denkbas E.B., Webster T.J.

Abstract: The principle of guided bone regeneration (GBR) in orthopedic, cranio-maxillofacial and dental tissue engineering applications is to create a secluded space for the treatment of large bone defects while excluding fibrous connective tissue formation at the defect area. In dental surgeries, a GBR membrane is placed near the dental implant in post-extraction sockets to grow new bone at the implant site, along with inhibiting infection due to the microbial nature of the mouth flora. Poly[(R)-3-hydroxybutyric acid] (PHB) is a natural polyester synthesized by a wide variety of microorganisms which has been proposed for various biomedical applications. In this study, to improve the performance of PHB as a GBR, a NaOH based alkaline treatment was designed to create nanofeatured PHB membranes. The newly fabricated nanofeatured PHB membranes were investigated for GBR applications. The results showed that a quick, simple, and inexpensive sodium hydroxide treatment modified the nanostructured surface morphology and chemistry of the PHB membranes by inducing hydrolysis of the ester bonds in the PHB backbone creating carboxylic surface functional groups, which increased the hydrophilicity of the PHB surfaces. Cytocompatibility studies showed increased proliferation of human osteoblasts (bone forming cells) on the NaOH treated PHB membranes compared to the untreated ones. Importantly, in vitro bacterial studies with Staphylococcus aureus (S. aureus) indicated that the NaOH-treated PHB surfaces inhibited S. aureus growth more than 60% after 48 hours of culture compared to the untreated PHB membrane. Thus, this study, for the first time, showed that nanofeatured PHB membranes modified with a NaOH treatment may be a useful antibacterial, osteoconductive GBR membrane for numerous orthopedic, cranio-maxillofacial and dental tissue engineering applications.

Title: Titanium exposure and yellow nail syndrome

Citation: Respiratory Medicine Case Reports, December 2015, vol./is. 16/(146-147)

Author(s): Ataya A., Kline K.P., Cope J., Alnuaimat H.

Abstract: Yellow nail syndrome is a rare disease of unclear etiology. We describe a patient who develops yellow nail syndrome, with primary nail and sinus manifestations, shortly after amalgam dental implants. A study of the patient’s nail shedding showed elevated nail titanium levels. The patient had her dental implants removed and had complete resolution of her sinus symptoms with no change in her nail findings. Since the patient’s nail findings did not resolve we do not believe titanium exposure is a cause of her yellow nail syndrome.
but perhaps a possible relationship exists between titanium exposure and yellow nail syndrome that requires further studies.

**Title:** Surface modification of zirconia with polydopamine to enhance fibroblast response and decrease bacterial activity in vitro: A potential technique for soft tissue engineering applications

**Citation:** Colloids and Surfaces B: Biointerfaces, December 2015, vol./is. 136/(74-83)

**Author(s):** Liu M., Zhou J., Yang Y., Zheng M., Yang J., Tan J.

**Abstract:** The quality of soft-tissue integration plays an important role in the short- and long-term success of dental implants. The aim of the present study was to provide a surface modification approach for zirconia implant abutment materials and to evaluate its influence on fibroblast behavior and oral bacteria adhesion, which are the two main factors influencing the quality of peri-implant soft-tissue seal. In this study, polydopamine (PDA)-coated zirconia was prepared and the surface characteristics were evaluated using scanning electron microscopy, atomic force microscopy, a contact-angle-measuring device, X-ray photoelectron spectroscopy, and Raman spectroscopy. The responses of human gingival fibroblasts (HGFs) to PDA-coated zirconia; i.e., adhesion, proliferation, morphology, protein synthesis, and gene expression, were analyzed. Additionally, the adhesion of Streptococcus gordonii and Streptococcus mutans to zirconia after PDA coating was assessed by scanning electron microscopy and live/dead staining. The material surface analyses suggested the successful coating of PDA onto the zirconia surface. The PDA coating significantly increased cell adhesion and proliferation compared with pristine zirconia. HGFs exhibited a high degree of spreading and secreted a high level of collagen type I on PDA-modified disks. Upregulation of integrin alpha<inf>5</inf>, beta<inf>1</inf>, beta<inf>3</inf> and fibronectin was noted in HGFs cultured on PDA-coated zirconia. The number of adherent bacteria decreased significantly on zirconia after PDA coating. In summary, our result suggest that PDA is able to modify the surface of zirconia, influence HGFs' behavior and reduce bacterial adhesion. Therefore, this surface modification approach holds great potential for improving soft-tissue integration around zirconia abutments in clinical application.

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