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The Latest Evidence for Restorative Dentistry

The Current Weight of Evidence of the Microbiological Profile Associated With Peri-Implantitis: A Systematic Review


BACKGROUND: There is still no consensus as regards the microorganisms that may be considered true peri-implant pathogens. Therefore, the aim of this systematic review was to determine the weight of evidence for the microorganisms related to peri-implantitis based on the results of "association studies".

METHODS: This review was performed following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). Two independent researchers searched the PubMed/Medline, Embase and Cochrane Library databases up to August 4th 2015, for studies comparing the microbiological outcomes of subgingival biofilm samples from healthy implants and implants with peri-implantitis.

Read Summary

Interventions for treating oral leukoplakia to prevent oral cancer

Authors: Giovanni Lodi, Roberto Franchini, Saman Warnakulasuriya, Elena Maria Varoni, Andrea Sardella, Alexander R Kerr, Antonio Carrassi, L CI MacDonald, Helen V Worthington

First published: 29 July 2016

Editorial Group: Cochrane Oral Health Group

Background: Oral leukoplakia is a relatively common oral lesion that, in a small proportion of people, precedes the development of oral cancer. Most leukoplakias are asymptomatic; therefore, the primary objective of treatment should be to prevent onset of cancer. This review updates our previous review, published in 2006.

Objectives: To assess the effectiveness, safety and acceptability of treatments for leukoplakia in preventing oral cancer.
Medication-related osteonecrosis of the jaw in patients with cancer

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

Literature review current through: Jul 2016. | This topic last updated: Apr 21, 2016.

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.

Etiology, prenatal diagnosis, obstetrical management, and recurrence of orofacial clefts

Author: Louise Wilkins-Haug, MD, PhD

Literature review current through: Jul 2016. | This topic last updated: May 25, 2016.

INTRODUCTION — The most common craniofacial malformation identified in the newborn is the orofacial cleft, which consists of cleft lip with or without cleft palate (CL/P) or isolated cleft palate (CP) [1]. They can occur as part of a syndrome involving multiple other organs or as an isolated malformation. Most studies suggest that about 70 percent of cases of CL/P and 50 percent of CP are nonsyndromic [2]. Although both congenital anomalies result in malformation of the midface, CL/P and CP differ with respect to embryology, etiology, candidate genes, associated abnormalities, and recurrence risk.

Complications, diagnosis, and treatment of odontogenic infections

Author: Anthony W Chow, MD, FRCPC, FACP

Literature review current through: Jul 2016. | This topic last updated: Jun 15, 2015.

INTRODUCTION — Odontogenic infections, consisting primarily of dental caries and periodontal disease (gingivitis and periodontitis), are common and have local (eg, tooth loss) and, in some cases, systemic implications. In the United States, it is estimated that 25 percent of adults over the age of 60 have lost all their teeth (edentulism), approximately one-half from periodontal disease and one-half from dental caries [1,2].

In addition to producing pain and discomfort, odontogenic infections can extend beyond natural barriers and result in potentially life-threatening complications, such as infections of the deep fascial spaces of the head and neck. (See "Deep neck space infections".)

Periodontal infection can also be associated with a number of systemic disorders. These include fever of unknown origin, bacteremic seeding of heart valves and prosthetic devices,
preterm birth of low birth weight children, and an increased risk for coronary heart disease and cerebrovascular events.

The complications, diagnosis, and treatment of odontogenic infections will be reviewed here. The epidemiology, pathogenesis, and clinical manifestations of these infections are discussed separately.

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**The Dental Elf**

**Mandibular implant overdentures: effect on nutritional status may be limited**  
**AUG 19 2016**

While oral health has been improving in recent decades the prevalence of edentulousness is still high in some countries and levels of edentulousness tend to increase with age. It has been estimated that as many as 46% of older adults are at risk of malnutrition and dental status is one of a range of factors that influence this. Provision of dentures has an impact on dietary patterns and some studies have demonstrated that implants supported overdentures are better than conventional dentures. The aim of this review was to investigate whether overdenture treatment provides greater improvement in nutrient intake and markers of nutritional status than treatment with a conventional denture in edentulous patients.

**Dental Implants: survival rate in irradiated patients**  
**AUG 5 2016**

Dental implants are often used oral rehabilitation following treatment for head and neck cancer. While surgery is the most common treatment for this group of patients this is frequently combined with radiotherapy. As radiotherapy reduces the vascularity and regenerative ability of bone tissue it can impact on the survival rate of implants.

The aim of this review was to compare the success rate of implants placed in irradiated human bone tissue with that of implants placed in non-irradiated areas.

**Periodontal disease and glycaemic control in diabetics**  
**AUG 8 2016**

It is estimated that in 2014 around 387 million people worldwide were affected by diabetes and this expected to reach 592 million by 2035. Poorly controlled diabetes is also a recognised risk factor for periodontal disease and in recent years studies have suggested a bi-directional relationship between periodontal disease and glycaemic levels.

The aim of this systematic review was to assess periodontal treatment in type2 diabetic patients reduces glycaemic and fasting plasma glucose levels.
New from the Dental Elf

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

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Peri-implantitis

**Title:** Temperature evaluation of dental implant surface irradiated with high-power diode laser.

**Citation:** Lasers in medical science, Sep 2016, vol. 31, no. 7, p. 1309-1316,

**Author(s):** Rios, F G, Viana, E R, Ribeiro, G M, González, J C, Abelenda, A, Peruzzo, D C

**Abstract:** The prevalence of peri-implantitis and the absence of a standard approach for decontamination of the dental implant surface have led to searches for effective therapies. Since the source of diode lasers is portable, has reduced cost, and does not cause damage to the titanium surface of the implant, high-power diode lasers have been used for this purpose. The effect of laser irradiation on the implants is the elevation of the temperature surface. If this elevation exceeds 47 °C, the bone tissue is irreversibly damaged, so for a safety therapy, the laser parameters should be controlled. In this study, a diode laser of GaAsAl was used to irradiate titanium dental implants, for powers 1.32 to 2.64 W (real) or 2.00 to 4.00 W (nominal), in continuous/pulsed mode DC/AC, with exposure time of 5/10 s, with/without air flow for cooling. The elevation of the temperature was monitored in real time in two positions: cervical and apical. The best results for decontamination using a 968-nm diode laser were obtained for a power of 1.65 and 1.98 W (real) for 10 s, in DC or AC mode, with an air flow of 2.5 l/min. In our perspective in this article, we determine a
suggested approach for decontamination of the dental implant surface using a 968-nm diode laser.

**Title:** A Classification System for Peri-implant Diseases and Conditions.

**Citation:** The International journal of periodontics & restorative dentistry, Sep 2016, vol. 36, no. 5, p. 699-705

**Author(s):** Sarmiento, Hector L, Norton, Michael R, Fiorellini, Joseph P

**Abstract:** Peri-implant bone levels are influenced by pathologic and nonpathologic conditions. The understanding of peri-implant disease has evolved over the past several decades, and the classification of peri-implantitis has been limited to descriptions of disease progression or those involving soft and/or hard tissues (peri-implant mucositis or peri-implantitis). However, no classification system has been established based on etiology. The objective of this study was to identify various etiologies for peri-implantitis and to establish a classification system based on the pathogenesis. The results indicate that the majority of bone loss was related to biofilm, followed by iatrogenic factors, exogenous irritants, absence of keratinized tissue, and extrinsic pathology. The proposed classification system will allow the clinician to properly diagnose peri-implant diseases in relation to etiology. These conditions may respond differently to applied therapies.

**Title:** Transmucosal Implant Placement with Submarginal Connective Tissue Graft in Area of Shallow Buccal Bone Dehiscence: A Three-Year Follow-Up Case Series.

**Citation:** The International journal of periodontics & restorative dentistry, Sep 2016, vol. 36, no. 5, p. 621-630

**Author(s):** Stefanini, Martina, Felice, Pietro, Mazzotti, Claudio, Marzadori, Matteo, Gherlone, Enrico F, Zucchelli, Giovanni

**Abstract:** The aim of the present case series study was to evaluate the short- and long-term (3 years) soft tissue stability of a surgical technique combining transmucosal implant placement with submarginal connective tissue graft (CTG) in an area of shallow buccal bone dehiscence. A sample of 20 patients were treated by positioning a transmucosal implant in an intercalated edentulous area. A CTG sutured to the inner aspect of the buccal flap was used to cover the shallow buccal bone dehiscence. Clinical evaluations were made at 6 months (T₁) and 1 (T₂) and 3 (T₃) years after the surgery. Statistically significant increases in buccal soft tissue thickness and improvement of vertical soft tissue level were achieved at the T₁, T₂, and T₃ follow-ups. A significant increase in keratinized tissue height was also found at T₃. No significant marginal bone loss was recorded. The submarginal CTG technique was able to provide simultaneous vertical and horizontal soft tissue increases around single implants with shallow buccal bone dehiscence and no buccal mucosal recession or clinical signs of mucositis or peri-implantitis at 1 and 3 years.
**Title:** Letter to the Editor: Re: Decontamination of Anodized Implant Surface With Different Modalities for Peri-Implantitis Treatment: Lasers and Mechanical Debridement With Citric Acid.

**Citation:** Journal of periodontology, Sep 2016, vol. 87, no. 9, p. 997.

**Author(s):** Giannelli, Marco, Bani, Daniele

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**Title:** "Peri-Implantitis": A Complication of a Foreign Body or a Man-Made "Disease". Facts and Fiction.

**Citation:** Clinical implant dentistry and related research, Aug 2016, vol. 18, no. 4, p. 840-849

**Author(s):** Albrektsson, Tomas, Canullo, Luigi, Cochran, David, De Bruyn, Hugo

**Abstract:** The discrepancy between some scientific views and the daily clinical experience with dental implants has made the topic of "periimplantitis" highly controversial, especially the discussion whether "periimplantitis" should even be considered a "disease" or whether marginal bone loss instead would represent a complication of having a foreign body placed in the oral cavity. The aim of the present paper was to present the outcomes from a consensus meeting on "peri-implantitis" in Rome, Italy (January 8-10, 2016). Seventeen clinical scientists were invited to, based on prepared reviews of the literature, discuss topics related to "periimplantitis." Oral implants may lose bone or even display clinical failure. However, progressive bone loss threatening implant survival is rare and limited to a percent or two of all implants followed up over 10 years or more, provided that controlled implant systems are being used by properly trained clinicians. There is very little evidence pointing to implants suffering from a defined disease entity entitled "peri-implantitis." Marginal bone loss around implants is in the great majority of cases associated with immune-osteolytic reactions. Complicating factors include patient genetic disorders, patient smoking, cement or impression material remnants in the peri-implant sulcus, bacterial contamination of the implant components and technical issues such as loose screws, mobile components or fractured materials. These reactions combine to result in cellular responses with the end result being a shift in the delicate balance between the osteoblast and the osteoclast resulting in bone resorption. However, the great majority of controlled implants display a foreign body equilibrium resulting in very high survival rates of the implants over long term of follow-up. © 2016 Wiley Periodicals, Inc.

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**Title:** Implant Prosthetic Rehabilitation in Controlled HIV-Positive Patients: A Prospective Longitudinal Study with 1-Year Follow-Up.

**Citation:** Clinical implant dentistry and related research, Aug 2016, vol. 18, no. 4, p. 725-734

**Author(s):** Gherlone, Enrico F, Capparé, Paolo, Tecco, Simona, Polizzi, Elisabetta, Pantaleo, Giuseppe, Gastaldi, Giorgio, Grusovin, Maria Gabriella

**Abstract:** The clinical trial aimed to evaluate the survival of implant-prosthetic rehabilitation in controlled HIV-positive patients. This mono-centric study included HIV patients with a
stable disease, requiring implant rehabilitation, with good oral hygiene. Each patient received at least one dental implant. After 90 days in the upper jaw and 60 days in the lower jaw, the appropriate prosthesis was delivered. Primary outcome measures were prosthetic failures, implant failures, peri-implant marginal bone level changes (MBLCs), and biological complications (peri-implantitis, pus, pain, paresthesia). Data were recorded before the intervention (T0), and 6 (T1) and 12 months (T2) after. Implants were positioned in 68 patients (22 females and 46 males; 194 implants). Two dropouts occurred for exacerbation of the disease before the sixth month of follow-up, and 66 patients (with 190 implants) completed the study. Forty-eight patients (70.6%) received total removable dentures; 11 patients (16.2%) received partial prosthesis, and nine patients (13.2%) received single elements. Implant failure occurred in nine patients (15 fixtures out of 190). These were early implant failures due to primary infection (five fixtures out of 190: 2.6%) and to peri-implantitis (10 fixtures out of 190: 5.2%). Prosthetic failure was registered in two patients (3% of patients) due to the loss of all the fixtures. Pus and pain were observed in 4/7 and 3/7 patients with peri-implantitis, respectively. No fractures of fixtures or paresthesia were registered. At T2, the mean peri-implant MBLC was $-1.19 \pm 0.87 \text{ mm}$. Within its limitations, the study showed that in a well-controlled population of HIV patients implant rehabilitation can be a suitable option with results slightly worse to those obtained in normal population. A higher incidence of peri-implant infections in the first six months was present pointing to the need of a proper protocol for infection control. © 2015 Wiley Periodicals, Inc.

Title: Decontamination of Anodized Implant Surface With Different Modalities for Peri-Implantitis Treatment: Lasers and Mechanical Debridement With Citric Acid.

Citation: Journal of periodontology, Aug 2016, vol. 87, no. 8, p. 953-961

Author(s): Htet, Moe, Madi, Marwa, Zakaria, Osama, Miyahara, Takayuki, Xin, Wang, Lin, Zayar, Aoki, Kazuhiro, Kasugai, Shohei

Abstract: Although oral rehabilitation with dental implants is a very promising and effective procedure, peri-implantitis is an emerging concern. Surgical and non-surgical methods have been applied to treat peri-implantitis together with various implant surface decontamination methods. However, there is no consensus concerning the most effective treatment for peri-implantitis. The aim of the present study is to evaluate the effects of erbium-doped:yttrium, aluminum, and garnet (Er:YAG) laser, photodynamic therapy (PDT), and titanium bur with and without citric acid on ligature-induced peri-implantitis around an anodized implant surface. Thirty dental implants with anodized surface (3.3 × 10 mm) were installed in the mandibles of five beagle dogs. After 3 months, peri-implantitis was induced by applying cotton ligatures subgingivally. After ligature removal (baseline), the implants were divided into the following treatment groups: 1) Er:YAG laser, 2) PDT, 3) titanium bur alone, and 4) titanium bur with citric acid. Animals were sacrificed after 3 months, and clinical, radiologic, histologic, and histomorphometric evaluations were conducted for all treatment modalities. The data were analyzed using one-way analysis of variance and Tukey test. A value of $P < 0.05$ was considered statistically significant. The titanium bur with citric acid group exhibited statistically significantly greater improvement in vertical bone height than the Er:YAG laser group and significantly better bone-to-implant contact than the PDT group and the bur-alone group. Within the limits of the study, the combination of
mechanical and chemical treatment proved to be the most effective treatment for disinfection of the anodized implant surface.

**Title:** Complications with allogeneic, cancellous bone blocks in vertical alveolar ridge augmentation: prospective clinical case study and review of the literature.

**Citation:** Oral surgery, oral medicine, oral pathology and oral radiology, Aug 2016, vol. 122, no. 2, p. e31.

**Author(s):** Draenert, Florian G, Kämmerer, Peer W, Berthold, Michael, Neff, Andreas

**Abstract:** Vertical bone augmentation in dental implantology is an indication for cancellous allogeneic bone blocks (ABB). However, these materials may lead to adverse reactions, which are known well in orthopedics but rarely published. Therefore, in this study, we performed an evaluation of the use of ABB in vertical bone augmentation in clinical dental implantology. The prospective clinical study included 20 cases with vertical augmentation using ABB and subsequent or simultaneous placement of implants in the lateral maxilla and mandible. Follow-up included panoramic radiography, tissue healing, and peri-implantitis. Because of the limited number of patients, the report was planned to be descriptive only. Loss of ABB or peri-implantitis of more than 30% of the intraosseous implant length was deemed to indicate failure. The study was cancelled after six cases because of an unexpectedly high number of complications (5 of 6; 83%). The average surveillance time was 1460 days. Three types of unsatisfying outcome were observed: type I, early complete loss of the augmentation with soft tissue defects after 3 to 8 weeks (n = 2); type II, early soft tissue maceration (up to 8 weeks) without loss of coverage and complete early bone healing with later peri-implantitis and bone loss after prosthetic loading (6 months or later; n = 2); and type III, complication-free bone healing with subsequent peri-implantitis after prosthetic loading (6 months or later; n = 1). Complications were observed in vertical augmentation with ABB and implant placement. After careful consideration, literature data were found to support these results and also suggest that tissue level implants may be advantageous in vertical bone augmentation with ABB. Copyright © 2016 Elsevier Inc. All rights reserved.

**Title:** Periodontal and peri-implant diseases: identical or fraternal infections?

**Citation:** Molecular oral microbiology, Aug 2016, vol. 31, no. 4, p. 285-301,

**Author(s):** Robitaille, N, Reed, D N, Walters, J D, Kumar, P S

**Abstract:** Peri-implant diseases (peri-implantitis and peri-implant mucositis) are bacterially driven infections. Peri-implantitis leads to aggressive bone resorption and eventual loss of the implant. Traditionally, peri-implantitis was regarded as microbially similar to periodontitis, and translocation of periodontal pathogens into the peri-implant crevice was considered as a critical factor in disease causation. However, evidence is emerging to suggest that the peri-implant and periodontal ecosystems differ in many important ways. The purpose of this review is to examine the evidence supporting microbial congruence and discordance in these two communities. Current evidence suggests that osseointegrated
implants truly create unique microenvironments that force microbial adaptation and selection. Further studies that revisit the "microbial reservoir" hypothesis and identify species that play an etiologic role in peri-implant disease and examine their transmission from teeth are needed. © 2015 John Wiley & Sons A/S. Published by John Wiley & Sons Ltd.

**Title:** Mechanical and chemical implant decontamination in surgical peri-implantitis treatment: preclinical "in vivo" study.

**Citation:** Journal of clinical periodontology, Aug 2016, vol. 43, no. 8, p. 694-701

**Author(s):** Carral, Cristina, Muñoz, Fernando, Permuy, María, Liñares, Antonio, Dard, Michel, Blanco, Juan

**Abstract:** The aim of the present study was to evaluate the effect of a titanium brush and chemical agents following surgical treatment of experimental peri-implantitis. Six implants were installed in the mandible of eight beagle dogs (unit of analysis) 3 months after tooth extraction. Experimental peri-implantitis was induced 3 months later. The defects were randomly allocated in three treatment groups: (a) TiBrush™ + sodium hypochlorite + chlorhexidine (TBH), (b) TiBrush™ + chlorhexidine (TB), (c) an ultrasonic device + chlorhexidine (US). The distal implant in each hemimandible was used as control, and no treatment was done. Clinical and histological measurements were performed after 3 months of healing. All treatment procedures resulted in statistically significant improvements of all clinical parameters. Histomorphometrical analysis revealed no statistically significant differences between treatment groups in terms of woven bone height (primary outcome). However, there were differences between test and control groups in terms of inflammation, bone defect depth and bone refill without differences between TBH and TB groups. Resolution of peri-implantitis after access surgery and decontamination of peri-implant surfaces with TiBrush™ with or without sodium hypochlorite is possible. However, the concomitant use of sodium hypochlorite has minor effect on treatment outcomes. © 2016 John Wiley & Sons A/S. Published by John Wiley & Sons Ltd.

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**Citation:** Molecular Oral Microbiology, August 2016, vol./is. 31/4(285-301)

**Author(s):** Robitaille N., Reed D.N., Walters J.D., Kumar P.S.

**Abstract:** Peri-implant diseases (peri-implantitis and peri-implant mucositis) are bacterially driven infections. Peri-implantitis leads to aggressive bone resorption and eventual loss of the implant. Traditionally, peri-implantitis was regarded as microbiologically similar to periodontitis, and translocation of periodontal pathogens into the peri-implant crevice was considered as a critical factor in disease causation. However, evidence is emerging to suggest that the peri-implant and periodontal ecosystems differ in many important ways. The purpose of this review is to examine the evidence supporting microbial congruence and discordance in these two communities. Current evidence suggests that osseointegrated implants truly create unique microenvironments that force microbial adaptation and
selection. Further studies that revisit the "microbial reservoir" hypothesis and identify species that play an etiologic role in peri-implant disease and examine their transmission from teeth are needed.

Bisphosphonate-related osteonecrosis of the jaw

**Title:** Bisphosphonate-related osteonecrosis of the jaw: a review of the potential efficacy of low-level laser therapy

**Citation:** Supportive Care in Cancer, September 2016, vol./is. 24/9(3687-3693)

**Author(s):** Latifyan S., Genot M.T., Klastersky J.

**Abstract:** Osteonecrosis of the jaw (ONJ) resulting from administration of bisphosphonates (BP) or denosumab is a rare but severe complication in cancer patients. Complete remission depends on the stage of ONJ; it can be estimated in the range of 20-30 %. Low-level laser therapy (LLLT) is a logical additional option, as it has been recognized effective for the management of chemotherapy and/or radiotherapy-induced mucositis. LLLT irradiation has anti-inflammatory actions and thus can help to control pain, as well as biostimulating properties with favorable actions on bacterial control and wound healing. We review the results of seven published studies of LLLT in BP-associated ONJ. LLLT results in an overall response rate of 55 % superior to that observed in controls (30 %). Our review suggests that there might be an advantage to add LLLT to the "classical" management of ONJ. This therapy is easy to administer and is not associated with any known side effects. Further research is needed to remove any doubt of protection or enhancement of carcinogenic processes. We believe that prospective well-controlled studies of LLLT in ONJ are warranted. If the positive results are confirmed, it would represent a great improvement for the quality of life of many patients.

**Title:** Resection and microvascular reconstruction of bisphosphonate-related osteonecrosis of the jaw: The role of microvascular reconstruction

**Citation:** Head and Neck, August 2016, vol./is. 38/8(1278-1285)

**Author(s):** Neto T., Horta R., Balhau R., Coelho L., Silva P., Correia-Sa I., Silva A., Eisele D.W.

**Abstract:** Background: Current treatment guidelines caution against osseous reconstruction using free flap tissue to treat bisphosphonate-related osteonecrosis of the jaw (BRONJ). The primary rationale for this stance is the theoretical risk of nonunion and recurrence of disease within the reconstruction. Emerging evidence suggests that these theoretical risks may be overestimated. We performed a literature review of this procedure for the treatment of advanced BRONJ. We also present a new case report of resection and microvascular reconstruction in a 58-year-old man with stage III BRONJ. Methods: A MEDLINE search was performed to gather all reports of maxillary and mandibular reconstruction using free tissue flap transfer for BRONJ. Inclusion criteria were confirmed
stage II or III BRONJ, free tissue transfer and reconstruction, and reported complications. Articles were excluded if they contained only local flap reconstruction, wound closure without reconstruction, or osteoradionecrosis. Outcomes from our case report were added to the analysis. Results: We identified 10 articles that met criteria. Adding our case, we identified 40 cases of free flap reconstruction. The rate of nonunion was 5% (2 of 40). Fistulas formed in 4 cases (10%). BRONJ recurred in 2 cases (5%). Conclusion: Complication rates after free flap microvascular reconstruction in BRONJ seem acceptable. Nonunion is relatively rare and should not be the sole reason to recommend against free flap reconstruction. A randomized clinical trial would help clarify the role of this procedure in refractory BRONJ; however, we believe that segmental resection and microvascular reconstruction is a viable option in select cases of BRONJ. © 2016 Wiley Periodicals, Inc. Head Neck 38:1278-1285, 2016.

Title: Identification of Risk Factors for Bisphosphonate-Associated Atypical Femoral Fractures and Osteonecrosis of the Jaw in a Pharmacovigilance Database.

Citation: The Annals of pharmacotherapy, Aug 2016, vol. 50, no. 8, p. 616-624

Author(s): Bejhed, Rebecca S, Kharazmi, Mohammad, Hallberg, Pär

Abstract: Atypical femoral fractures (AFs) and osteonecrosis of the jaw (ONJ) are well-known adverse drug reactions (ADRs) associated with bisphosphonates. To prevent these ADRs and to aid in the search for pathogenic mechanisms, knowledge of risk factors can be helpful. To identify risk factors for bisphosphonate-related ONJ and AF. In this case-control study of reports of bisphosphonate-related ADRs from February 16, 1984, to October 16, 2013, in the Swedish national database of ADRs, we compared characteristics for cases of ONJ (n = 167) and AF (n = 55) with all other bisphosphonate-related ADRs (n = 565) with regard to demographic variables, clinical characteristics, and concomitant drug treatments. We adjusted for multiple comparisons with Bonferroni correction. Time to onset of ADRs differed statistically significantly between cases of AF and controls (2156 vs 111 days). For ONJ versus controls, differences were statistically significant for time to onset (1240 vs 111 days), intravenous administration (40% vs 20%), dental procedures (49% vs 0.2%) and prostheses (5% vs 0%), cancer disease (44% vs 12%), multiple myeloma (21% vs 1%), rheumatoid arthritis (14% vs 5%), and treatment with antineoplastic agents and oxycodone. These results lend further evidence to previously identified risk factors for ONJ—that is, intravenous bisphosphonate administration; invasive dental procedures and dental prostheses; cancer disease, in particular multiple myeloma; and possibly, long-term bisphosphonate treatment. A putative further risk factor is rheumatoid arthritis. Only long-term bisphosphonate treatment was more common among AF cases. The lack of overlap of risk factors between ONJ and AF suggests different pathogenic mechanisms. © The Author(s) 2016.

Title: Efficacy of laser therapy in the management of bisphosphonate-related osteonecrosis of the jaw (BRONJ): a systematic review.

Citation: Lasers in medical science, Aug 2016, vol. 31, no. 6, p. 1261-1272
Author(s): Weber, João Batista Blessmann, Camilotti, Renata Stifelman, Ponte, Monique Estêr

Abstract: Bisphosphonate-related osteonecrosis of the jaw is a well-known potential side effect of long-term bisphosphonate therapy; the primary objective of the treatment should be to improve patient quality of life through pain and infection management, to prevent the development of new lesions, and to slow disease progression. In recent years, the use of laser for bisphosphonate-related osteonecrosis of the jaw has become more widespread, due to its use of administration and widely reported beneficial effects on tissue healing. The present systematic review of the literature sought to elucidate whether low-level laser therapy has positive effects on the treatment of bisphosphonate-related osteonecrosis of the jaw. We conducted a systematic search of the PubMed, EMBASE, and Cochrane Library electronic databases, with no restrictions on language or year of publication. Search strategies were formulated using keywords and Boolean operators. The electronic search strategy retrieved 55 records. From 55 articles, 16 were selected for full-text review, and of these, 10 were ultimately included for data analysis in this review. Our findings show that treatment modalities including laser were associated with superior outcomes in terms of cure or improvement of bisphosphonate-related osteonecrosis of the jaw lesions as compared with conventional surgical and/or conservative drug therapy. It can be concluded that combined treatment with antibiotics, minimally invasive surgery (including Er:YAG laser surgery), and low-level laser therapy in the early stages of the disease should be the gold standard for bisphosphonate-related osteonecrosis of the jaw management.

Title: Assessing the utility of serum C-telopeptide cross-link of type 1 collagen as a predictor of bisphosphonate-related osteonecrosis of the jaw: A systematic review and meta-analysis.

Citation: Journal of the American Dental Association (1939), Jul 2016, vol. 147, no. 7, p. 551

Author(s): Enciso, Reyes, Keaton, Jill, Saleh, Nadia, Ahmadieh, Azadeh, Clark, Glenn T, Sedghizadeh, Parish P

Abstract: The authors of this systematic review and meta-analysis assessed the utility of serum C-telopeptide cross-link of type 1 collagen (sCTX), a biomarker of bone resorption, as a predictor of the development of bisphosphonate-related osteonecrosis of the jaw (BRONJ). The authors searched for studies involving adult participants, written in English, and published through January 20, 2016, using the following electronic databases: the Cochrane Library, MEDLINE via PubMed, and Web of Science. They also searched Google Scholar and the reference lists of all eligible trials and reviews. They identified 16 articles that met their inclusion criteria (9 controlled studies and 7 case series). They applied the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines for systematic reviews and meta-analyses. They independently extracted data in duplicate, including the characteristics of study participants, risk factors, control groups, and outcomes. They assessed risk of bias, and they resolved any disagreements between review authors through discussion. A meta-analysis with 9 controlled studies revealed no significant difference in mean sCTX values between patients with BRONJ and control participants (difference in means, -31.417; 95% confidence interval [CI], -91.560 to 28.726; P = .306). A second meta-analysis with 4 studies showed no significant difference in risk of having an
sCTX value below 150 picograms per milliliter for patients with BRONJ compared with control participants (risk ratio, 1.892; 95% CI, 0.636-5.626; P = .251). A systematic review of the literature with meta-analysis does not support the use of sCTX levels as a predictor of the development of BRONJ. Further prospective large sample studies are needed to understand the role of sCTX as a predictor for BRONJ. Copyright © 2016 American Dental Association. Published by Elsevier Inc. All rights reserved.

**Title:** Treatment of bisphosphonate-related osteonecrosis of the jaw with platelet-rich fibrin.

**Citation:** Journal of the Formosan Medical Association = Taiwan yi zhi, Jul 2016, vol. 115, no. 7, p. 585-586

**Author(s):** Tsai, Lo-Lin, Huang, Yu-Feng, Chang, Yu-Chao

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**Cleft lip and palate**

**Title:** Analysis of the dentoalveolar effects of slow and rapid maxillary expansion in complete bilateral cleft lip and palate patients: a randomized clinical trial.

**Citation:** Clinical oral investigations, Sep 2016, vol. 20, no. 7, p. 1837-1847

**Author(s):** de Medeiros Alves, Arthur César, Garib, Daniela Gamba, Janson, Guilherme,

**Abstract:** The purpose of this study was to compare the dentoalveolar effects of slow (SME) and rapid (RME) maxillary expansions in patients with complete bilateral cleft lip and palate (BCLP). A sample of 50 patients with BCLP and maxillary arch constriction was randomly and equally allocated into two groups. Group SME comprised patients (mean age of 8.8 years) treated with quad-helix appliance. Group RME comprised individuals (mean age of 8.9 years) treated with Hyrax expander. Digital dental models obtained immediately pre-expansion (T1) and 6 months after the active expansion period (T2) were used for measuring maxillary dental arch widths, arch perimeter, arch length, palatal depth, buccolingual inclination of posterior teeth and differential amount of expansion accomplished at the canine and molar regions. Inter-phase and intergroup comparisons were performed using paired t tests and t tests, respectively (p < 0.05). SME and RME caused significant increase of arch widths and arch perimeter. Arch length and palatal depth decreased nonsignificantly with SME but significantly with RME. Buccal tooth inclination was significant only for maxillary deciduous canines in both groups. The quad-helix appliance showed a significant differential expansion between anterior and posterior regions. No differences were observed between SME and RME for all variables. Differences were not found between the dentoalveolar effects of SME and RME in patients with BCLP. SME demanded a greater therapy time compared to RME. Both expansion procedures can be similarly indicated to correct maxillary arch constriction in patients with BCLP in the mixed dentition.
Title: Ultrasound Evaluation of Primary Alveolar Grafting in Cleft Lip/Palate Treatment: Development of a Novel Sonographic Grading System.

Citation: The Cleft palate-craniofacial journal : official publication of the American Cleft Palate-Craniofacial Association, Sep 2016, vol. 53, no. 5, p. 614-621

Author(s): Chang, Daniel K, Kanack, Melissa, Pretorius, Dolores, Calvert, Stephanie, Patino-Ochoa, Cesar, Gosman, Amanda

Abstract: To explore ultrasonographic evaluation of primary alveolar repair in cleft lip/palate patients and develop a grading system to assess outcomes of graft success. Sixteen patients with an average age of 2 years 1 month had sonograms performed at various points in their treatment to determine the feasibility of ultrasound in visualizing alveolar bone defects and changes over time postgrafting. A total of 23 sonograms were performed: 21 at an average of 12 months postoperatively and 2 at an average of 1 month preoperatively. A 10-point grading system was developed assessing three categories: locations of lateral bone bridging across the cleft, quantification of residual defects with air or fluid channels, and locations of calcification. Three operators graded 10 sonograms to assess interobserver reliability, and the scores were also validated against dental radiographs in patients old enough for radiographic imaging. Linear weighted kappa statistics revealed substantial interobserver agreement for total scores, with an average kappa value of .708. In limited patients with radiographs, a total score of 9/10 correlated with a Chelsea score of 6.5/8 and category A. Sonographic evaluation, coupled with this novel grading system, shows potential for early assessment of outcomes of graft success when evaluating new techniques of primary alveolar grafting.

Title: A Comparison of Three Viewing Media for Assessing Dental Arch Relationships in Patients With Unilateral Cleft Lip and Palate.

Citation: The Cleft palate-craniofacial journal : official publication of the American Cleft Palate-Craniofacial Association, Sep 2016, vol. 53, no. 5, p. 578-583

Author(s): Zhu, Shiwen, Yang, Yanqi, Gu, Min, Khambay, Balvinder

Abstract: To determine the repeatability and reproducibility of using three different viewing media to assess the outcomes of the dental arch relationships of patients with unilateral cleft lip and palate (UCLP) using the GOSLON Yardstick. The GOSLON Yardstick was used to rate the dental arch relationships of 29 patients with UCLP. Three experienced calibrated orthodontists rated the plaster study models, digital study models, and stereoscopic projected three-dimensional (3D) study models separately. There was a minimum of a 1-week interval between each rating session. All three rating sessions were repeated 1 month later. A linear weighted kappa statistic was performed to assess intra-rater repeatability and inter-rater reproducibility, as well as the comparison between different viewing media using Kendall’s Coefficient of Concordance (Kendall’s W) statistic. Intra-rater repeatability was very good for all three viewing media (kappa = 0.83-0.92). Inter-rater reproducibility was good to very good across the three viewing media (kappa = 0.63-0.88). Agreements between plaster study models and digital study models or stereoscopic projected 3D study
models were good to very good (kappa = 0.78-0.97 and kappa = 0.72-0.97, respectively), and a Kendall’s W ranging from 0.86 to 0.92 (P < .001). Stereoscopic projected 3D is an alternative method to assess the outcomes of dental arch relationships in patients with cleft lip and palate using the GOSLON Yardstick. It could also be used for viewing patient records, as it recovers the full 3D information captured at the time of the clinical examination.

**Title:** Are photographs a suitable alternative to dental study casts when assessing primary surgical outcome in children born with unilateral cleft lip and palate?

**Citation:** European journal of orthodontics, Aug 2016, vol. 38, no. 4, p. 341-344

**Author(s):** Jones, Timothy, Leary, Sam, Atack, Nikki, Chawla, Ourvinder, Ness, Andy, Ireland, Tony, Sandy, Jonathan

**Abstract:** To compare the use of the 5-year-olds’ index on both dental study casts and intraoral photographs when measuring primary surgical outcome for children born with unilateral cleft lip and palate (UCLP). A cross-sectional study. Models and photographs collected from cleft units across the UK as part of the CCUK (Cleft Care UK) study were scored by two clinicians at the School of Oral and Dental Sciences, Bristol, UK. Five-year-old children born with UCLP as part of the CCUK study. One hundred and ninety-eight had dental study casts available and 49 had intraoral photographs available. The records of both groups, that is study casts (n = 198) and photographs (n = 49) were scored using the 5-year-olds’ index on two occasions by two examiners. Reliability of scoring is reduced for intraoral photographs compared with dental study casts. Using weighted Kappa the inter-rater reliability for dental study casts was 0.72 to 0.77 and the inter-rater reliability for intraoral photographs was 0.52 to 0.59. The photographs and study casts were not matched for each individual and were collected by a number of different clinicians in each unit, both of which will have had an effect on the quality and consistency of the final records. Dental study casts provide more reliable results and thus still represent the gold standard when assessing primary surgical outcome in cleft care using the 5-year-olds’ index. © The Author 2015. Published by Oxford University Press on behalf of the European Orthodontic Society. All rights reserved. For permissions, please email: journals.permissions@oup.com.

**Title:** Which index should be used to measure primary surgical outcome for unilateral cleft lip and palate patients?

**Citation:** European journal of orthodontics, Aug 2016, vol. 38, no. 4, p. 345-352

**Author(s):** Jones, Timothy, Leary, Sam, Atack, Nikki, Ireland, Tony, Sandy, Jonathan

**Abstract:** To determine the optimal dentoalveolar measure to assess unilateral cleft lip and palate (UCLP) patient plaster models. The models of 34 patients with UCLP taken at 5, 10, and 15-20 years of age were scored by two examiners on two separate occasions using five indices: the 5 Year Olds’ (5YO), GOSLON, Modified Huddart/Bodenham (MHB), EUROCRAN, and Overjet. Reliability, validity, and ease of use were recorded for each index/examiner. All models were scored in either Bristol Dental Hospital or Derriford Hospital, Plymouth, United
Kingdom by senior orthodontic clinicians. Highest overall reliability was seen with MHB (Kappa = 0.56-0.97). Predictive validity was similar for MHB, GOSLON, and 5YO with a 50-65 per cent prediction of final outcome from 5 and 10 years. EUROCRAN palatal index showed no clear predictive validity (Spearman's correlation = 0.20-0.21). Agreement to the gold standard 5YO score at the 5-year age group was high for MHB (Kappa = 0.83) and moderate for GOSLON (Kappa = 0.59). Agreement to the gold standard GOSLON score at 10 years was highest for 5YO (Kappa = 0.69), followed by Overjet (Kappa = 0.59) and MHB (Kappa = 0.46). Time to score 34 models per index (minutes): GOSLON (13.4) < Overjet (13.6) < 5YO (19.4) < EUROCRAN (24.8) < MHB (27.4). As an outcome measure of UCLP models, only MHB and 5YO indices can be recommended for use at 5 years of age and GOSLON at 10 years of age. © The Author 2016. Published by Oxford University Press on behalf of the European Orthodontic Society. All rights reserved. For permissions, please email: journals.permissions@oup.com.

Title: Treatment outcome after neonatal cleft lip repair in 5-year-old children with unilateral cleft lip and palate.

Citation: International journal of pediatric otorhinolaryngology, Aug 2016, vol. 87, p. 71-77

Author(s): Košková, Olga, Vokurková, Jitka, Vokurka, Jan, Bryšova, Alena, Šenovský, Pavel, Čefelinová, Julie, Lukášová, Darina, Dorociaková, Petra, Abelovský, Juraj

Abstract: The aim of this study was to assess speech outcomes and dental arch relationship of 5-year-old Czech patients with unilateral cleft lip and palate (UCLP) who have undergone neonatal cleft lip repair and one-stage palatal closure. Twenty-three patients with UCLP, born between 2009 and 2010, were included in the study. Three universal speech parameters (hypernasality, articulation and speech intelligibility) have been devised for speech recordings evaluation. Outcomes of dental arch relationship were evaluated by applying the GOSLON Yardstick and subsequently compared with the GOSLON outcome of other cleft centers. Moderate hypernasality was present in most cases, the mean value for articulation and speech intelligibility was 2.07 and 1.93, respectively. The Kappa values for inter-examiner agreement for all the three speech outcomes ranged from 0.786 to 0.808. Sixty-three percent of patients were scored GOSLON 1 and 2, 26% GOSLON 3, and 10% GOSLON 4. GOSLON mean score was 2.35. Interrater agreement was very good, represented by kappa value of 0.867. The treatment protocol, involving neonatal cleft lip repair and one-stage palatal repair performed up to the first year of UCLP patient's life, has shown good speech outcomes and produced very good treatment results in regard to maxillary growth, comparable with other cleft centers. Copyright © 2016 Elsevier Ireland Ltd. All rights reserved.

Title: The validity and reliability of an automated method of scoring dental arch relationships in unilateral cleft lip and palate using the modified Huddart-Bodenham scoring system.

Citation: European journal of orthodontics, Aug 2016, vol. 38, no. 4, p. 353-358
Author(s): Martin, Catherine B, Ma, Xinhui, McIntyre, Grant T, Wang, Weijie, Lin, Ping, Chalmers, Elinor V, Mossey, Peter A

Abstract: To evaluate an automated software tool for the assessment of dental arch relationships using the modified Huddart and Bodenham (MHB) index. Cohort of 43 models of subjects aged 9-21 with UCLP and the ten GOSLON reference models sets. The 53 sets of plaster models were scored using the MHB index and scanned with a benchtop scanner. The digital models were MHB scored visually using a commercial software program and landmarked for automatic scoring using a software plug-in. Scoring/landmarking was undertaken by three observers and repeated after 1 month. Intra- and inter-observer reproducibility were tested using Cronbach's alpha and intraclass correlation coefficients (ICC) (threshold > 0.9). Bland-Altman plots demonstrated inter-observer agreement for each model format. Random and systematic error with digital landmark identification error were determined using the x, y, and z co-ordinates for 28 models digitized twice 1 month apart using Cronbach's alpha and a t-test, respectively. Intra-operator landmark identification was excellent (Cronbach's alpha = 0.933) with no differences between sessions (P > 0.05). Intra-observer reproducibility was excellent for all examiners (Cronbach's alpha and ICC 0.986-0.988). Inter-observer reproducibility was highest for the software plug-in (0.991), followed by plaster (0.989) and OrthoAnalyzer (0.979) and Bland-Altman plots confirmed no systematic bias and greater consistency of scores with the automated software. The automated MHB software tool is valid, reproducible, and the most objective method of assessing maxillary arch constriction for patients with UCLP. The authors declare no conflict of interest or financial relationship with any organization or software used within the study. © The Author 2016. Published by Oxford University Press on behalf of the European Orthodontic Society. All rights reserved. For permissions, please email: journals.permissions@oup.com.

Title: Treatment outcome after neonatal cleft lip repair in 5-year-old children with unilateral cleft lip and palate

Citation: International Journal of Pediatric Otorhinolaryngology, August 2016, vol./is. 87/(71-77)

Author(s): Koskova O., Vokurkova J., Vokurka J., Brysova A., Senovsky P., Cefelinova J., Lukasova D., Dorociakova P., Abelovsky J.

Abstract: Introduction: The aim of this study was to assess speech outcomes and dental arch relationship of 5-year-old Czech patients with unilateral cleft lip and palate (UCLP) who have undergone neonatal cleft lip repair and one-stage palatal closure. Methods and materials: Twenty-three patients with UCLP, born between 2009 and 2010, were included in the study. Three universal speech parameters (hypernasality, articulation and speech intelligibility) have been devised for speech recordings evaluation. Outcomes of dental arch relationship were evaluated by applying the GOSLON Yardstick and subsequently compared with the GOSLON outcome of other cleft centers. Results: Moderate hypernasality was present in most cases, the mean value for articulation and speech intelligibility was 2.07 and 1.93, respectively. The Kappa values for inter-examiner agreement for all the three speech outcomes ranged from 0.786 to 0.808. Sixty-three percent of patients were scored GOSLON
and 2, 26% GOSLON 3, and 10% GOSLON 4. GOSLON mean score was 2.35. Interrater agreement was very good, represented by kappa value of 0.867. Conclusion: The treatment protocol, involving neonatal cleft lip repair and one-stage palatal repair performed up to the first year of UCLP patient's life, has shown good speech outcomes and produced very good treatment results in regard to maxillary growth, comparable with other cleft centers.

**Periodontal disease and antibiotics**

**Title:** Nonsurgical therapy of chronic periodontitis with adjunctive systemic azithromycin or amoxicillin/metronidazole.

**Citation:** Clinical oral investigations, Sep 2016, vol. 20, no. 7, p. 1765-1773,

**Author(s):** Jentsch, Holger F R, Buchmann, Andreas, Friedrich, Abel, Eick, Sigrun

**Abstract:** The objective of the present study is to compare the effect of systemic adjunctive use of azithromycin with amoxicillin/metronidazole to scaling and root planing (SRP) in a clinical study. Data from 60 individuals with chronic periodontitis were evaluated after full-mouth SRP. Antibiotics were given from the first day of SRP, in the test group (n = 29), azithromycin for 3 days and, in the control group (n = 31), amoxicillin/metronidazole for 7 days. Probing depth (PD), attachment level (AL), and bleeding on probing (BOP) were recorded at baseline and after 3 and 12 months. Gingival crevicular fluid was analyzed for matrix metalloprotease (MMP)-8 and interleukin (IL)-1beta levels. Subgingival plaque was taken for assessment of the major bacteria associated with periodontitis. In both groups, PD, AL, and BOP were significantly reduced (p < 0.001). A few significant differences between the groups were found; AL and BOP were significantly better in the test than in the control group at the end of the study (p = 0.020 and 0.009). Periodontopathogens were reduced most in the test group. A noninferiority of the treatment with azithromycin in comparison with amoxicillin/metronidazole can be stated. The administration of azithromycin could be an alternative to the use of amoxicillin/metronidazole adjunctive to SRP in patients with moderate or severe chronic periodontitis; however, a randomized placebo-controlled multicenter study is needed. Application of azithromycin as a single antibiotic for 3 days might be considered as an additional adjunctive antibiotic to SRP in selected patients.

**Title:** Role of bacteria in leukocyte adhesion deficiency-associated periodontitis

**Citation:** Microbial Pathogenesis, September 2016, vol./is. 94/(21-26)

**Author(s):** Hajishengallis G., Moutsopoulos N.M.

**Abstract:** Leukocyte adhesion deficiency Type I (LAD-I)-associated periodontitis is an aggressive form of inflammatory bone loss that has been historically attributed to lack of neutrophil surveillance of the periodontal infection. However, this form of periodontitis has proven unresponsive to antibiotics and/or mechanical removal of the tooth-associated biofilm. Recent studies in LAD-I patients and relevant animal models have shown that the
fundamental cause of LAD-I periodontitis involves dysregulation of a granulopoietic cytokine cascade. This cascade includes interleukin IL-23 (IL-23) and IL-17 that drive inflammatory bone loss in LAD-I patients and animal models and, moreover, foster a nutritionally favorable environment for bacterial growth and development of a compositionally unique microbiome. Although the lack of neutrophil surveillance in the periodontal pockets might be expected to lead to uncontrolled bacterial invasion of the underlying connective tissue, microbiological analyses of gingival biopsies from LAD-I patients did not reveal tissue-invasive infection. However, bacterial lipopolysaccharide was shown to translocate into the lesions of LAD-I periodontitis. It is concluded that the bacteria serve as initial triggers for local immunopathology through translocation of bacterial products into the underlying tissues where they unleash the dysregulated IL-23/IL-17 axis. Subsequently, the IL-23/IL-17 inflammatory response sustains and shapes a unique local microbiome which, in turn, can further exacerbate inflammation and bone loss in the susceptible host.

**Title:** In Vivo Inhibition of Porphyromonas gingivalis Growth and Prevention of Periodontitis With Quorum-Sensing Inhibitors.

**Citation:** Journal of periodontology, Sep 2016, vol. 87, no. 9, p. 1075-1082

**Author(s):** Cho, Young-Jae, Song, Hyun Young, Ben Amara, Heithem, Choi, Bong-Kyu, Eunju, Ryu, Cho, Young-Ah, Seol, Yangjo, Lee, Yongmoo, Ku, Young, Rhyu, In-Chul, Koo, Ki-Tae

**Abstract:** Autoinducer (AI)-2 has an important role in biofilm formation in the oral environment. Mature biofilms formed as a result of the cell-to-cell communication make it difficult to overcome periodontitis with the use of antibiotics. Previous in vitro studies suggest that quorum-sensing inhibitors (QSIs) interfere with AI-2. This study compares the QSI effects resulting from an oral inoculation of Porphyromonas gingivalis in an experimental animal model. Forty-five male mice were divided into three groups (n = 15 each): 1) infection; 2) QSI; and 3) control. Infection and QSI groups received oral inoculation of P. gingivalis, whereas treatment with QSIs (furane compound and d-ribose) was only performed in the QSI group. The control group was a negative control not receiving manipulation. After 42 days, mice were sacrificed, and the distance from the alveolar bone crest (ABC) to the cemento-enamel junction (CEJ) was measured by microcomputed tomography. P. gingivalis DNA was quantified in the soft and hard tissues around the molar teeth by real-time polymerase chain reaction. Distance from ABC to CEJ was significantly increased in the P. gingivalis infection group compared with the control group (P = 0.02) and significantly decreased in the QSI group compared with the infection group (P = 0.02). The QSI group contained 31.64% of the bacterial DNA count of the infection group. Use of QSIs in the mice infection model showed a reduction of bone breakdown and a decrease in the number of bacteria in vivo, suggesting that QSIs can be a new approach to prevention and treatment of periodontitis.

**Title:** Non-surgical periodontal treatment in conjunction with 3 or 7 days systemic administration of amoxicillin and metronidazole in severe chronic periodontitis patients. A placebo-controlled randomized clinical study.

**Citation:** Journal of clinical periodontology, Sep 2016, vol. 43, no. 9, p. 767-777
**Author(s):** Cosgarea, Raluca, Juncar, Raluca, Heumann, Christian, Tristiu, Roxana, Lascu, Liana, Arweiler, Nicole, Stavropoulos, Andreas, Sculean, Anton

**Abstract:** To evaluate the effect of 3 or 7 days systemic administration of amoxicillin (AMX) and metronidazole (MET) or placebo as adjunct to non-surgical periodontal treatment in severe chronic periodontitis patients. One hundred and two patients with severe chronic periodontitis [e.g. ≥1 site with probing pocket depth (PD) ≥ 6 mm per quadrant] were randomly divided into three equally sized groups and treated with either scaling and root planing within 24 h (SRP) + placebo (Group A) or SRP + AMX + MET (both 500 mg × 3 times daily) for 3 days (Group B) or SRP + AMX + MET (both 500 mg × 3 times daily) for 7 days (Group C). PD, clinical attachment level (CAL), bleeding on probing (BOP), full-mouth plaque scores (FMPS) and gingival bleeding index (GBI) were assessed prior to treatment (baseline), and at 3 and 6 months post-treatment. The primary outcome variable was the difference (Δ) in the number of sites with PD ≥ 6 mm. Ninety-one patients completed the study. At both 3 and 6 months, all three treatment protocols resulted in statistically significant improvements compared to baseline for all evaluated clinical parameters (p < 0.001). At 6 months, a statistically significantly greater reduction in the mean number of sites with PD ≥ 6 mm was observed in group B (28.62 ± 15.32 sites) and group C (30.45 ± 15.04 sites) compared to the placebo group (17.10 ± 14.68 sites). Furthermore, both the 3- and the 7-day antibiotic regimen resulted in statistically significantly higher clinical improvements compared to the placebo group (p < 0.05). The present findings indicate that in patients with severe chronic periodontitis, non-surgical periodontal therapy in conjunction with a 3 or 7 days systemic administration of AMX + MET may lead to significantly greater clinical improvements compared to non-surgical therapy alone. © 2016 John Wiley & Sons A/S. Published by John Wiley & Sons Ltd.

**Title:** Bacteremia after Endodontic Procedures in Patients with Heart Disease: Culture and Molecular Analyses.

**Citation:** Journal of endodontics, Aug 2016, vol. 42, no. 8, p. 1181-1185

**Author(s):** Reis, Luciana C, Rôças, Isabela N, Siqueira, José F, de Uzeda, Milton, Lacerda, Vane S, Domingues, Regina M C P, Moraes, Saulo R, Saraiva, Roberto M

**Abstract:** Infective endocarditis (IE) is still associated with high mortality, and antibiotic prophylaxis strategies are under intense debate. We evaluated the incidence of bacteremia after root canal preparation in teeth with necrotic pulps and apical periodontitis. Blood samples were taken before and 5 and 30 minutes after endodontic treatment in teeth with apical periodontitis from individuals at high (n = 21) or no risk (n = 11) for IE. The former received prophylactic antibiotic therapy. Bacteriologic samples were taken from root canals before chemomechanical preparation to confirm pulp infection. Samples were subjected to aerobic and anaerobic culture and quantitative real-time polymerase chain reaction (qPCR), the latter to determine the total bacterial and streptococcal levels. Culture revealed no bacteremia in all individuals. Analysis by qPCR showed that bacterial DNA occurred in all root canal samples. qPCR showed a similar incidence of bacteremia between patients who
received or did not receive prophylactic antibiotic therapy (P > .05). In blood samples taken 5 minutes after endodontic procedures, bacteria were detected in 2 of 11 (18%) individuals not taking antibiotics and in 4 of 21 (19%) patients under prophylaxis. After 30 minutes, the incidence of bacteremia decreased to 2 of 21 (10%) in patients taking antibiotics and was undetectable in patients at no risk of IE. The incidence of bacteremia by streptococci was identical as that for total bacteria. No detectable bacteremia was evident by culture after treatment of infected root canals. Molecular analysis revealed bacterial DNA and streptococci in blood from some patients without a significant difference between individuals receiving or not receiving antibiotic prophylaxis. Copyright © 2016 American Association of Endodontists. Published by Elsevier Inc. All rights reserved.

Title: Photodynamic therapy with intralesional methylene blue and a 635 nm light-emitting diode lamp in hidradenitis suppurativa: a retrospective follow-up study in 7 patients and a review of the literature.

Citation: Photochemical & photobiological sciences : Official journal of the European Photochemistry Association and the European Society for Photobiology, Aug 2016, vol. 15, no. 8, p. 1020-1028

Author(s): Agut-Busquet, Eugènia, Romaní, Jorge, Gilaberte, Yolanda, García-Malinis, Ana, Ribera-Pibernat, Miquel, Luelmo, Jesús

Abstract: Hidradenitis suppurativa is a chronic inflammatory skin disease which has an estimated prevalence of 1%. It is characterized by the formation of recurrent painful suppurative nodules and abscesses in the flexural areas of the body. It is believed that its pathogenesis involves an aberrant, genetically-determined activation of innate immunity against the bacterial commensal flora of intertriginous areas. It has been found that the formation of antibiotic-resistant bacterial biofilms is a common finding in hidradenitis lesions. Photodynamic therapy with different compounds and light sources has demonstrated its efficacy in a number of infectious diseases such as nail mycosis and chronic periodontitis. We retrospectively report our experience in the treatment of hidradenitis with photodynamic therapy using intralesional methylene blue and a 635 nm light-emitting diode lamp in 7 patients. Two patients received one session whereas 5 patients received two sessions. At one month follow-up good response was achieved in 6 patients. After 6 months, 5 patients (71%) maintained remission of the disease in the treated area. In view of the results and literature review, we regard methylene blue as an ideal photosensitizer for photodynamic therapy in this disease.

Title: Necrotizing Periodontal Diseases in Children: A Literature Review and Adjustment of Treatment.

Citation: Journal of tropical pediatrics, Aug 2016, vol. 62, no. 4, p. 331-337

Author(s): Marty, Mathieu, Palmieri, James, Noirrit-Esclassan, Emmanuelle, Vaysse, Frédéric, Bailleul-Forestier, Isabelle
Abstract: Necrotizing ulcerative gingivitis, sometimes observed in young children, may lead to necrotizing stomatitis and noma. Therefore, its interception is a necessity and a challenge for the paediatric practitioners. First, this article aims to propose a systematic review of recent literature on the use of local antiseptic and antibiotic prescription in this particular periodontal condition. Then, a protocol is proposed to have a simple, costless and reproducible treatment on children. © The Author [2016]. Published by Oxford University Press. All rights reserved. For Permissions, please email: journals.permissions@oup.com.

Head and neck oncology and dentistry

Title: International field testing of the psychometric properties of an EORTC quality of life module for oral health: the EORTC QLQ-OH15

Citation: Supportive Care in Cancer, September 2016, vol./is. 24/9(3915-3924)

Author(s): Hjermstad M.J., Bergenmar M., Bjordal K., Fisher S.E., Hofmeister D., Montel S., Nicolatou-Galitis O., Pinto M., Raber-Durlacher J., Singer S., Tomaszewska I.M., Tomaszewski K.A., Verdonck-de Leeuw I., Yarom N., Winstanley J.B., Herlofson B.B., on behalf of the EORTC QoL Group

Abstract: Purpose: This international EORTC validation study (phase IV) is aimed at testing the psychometric properties of a quality of life (QoL) module related to oral health problems in cancer patients. Methods: The phase III module comprised 17 items with four hypothesized multi-item scales and three single items. In phase IV, patients with mixed cancers, in different treatment phases from 10 countries completed the EORTC QLQ-C30, the QLQ-OH module, and a debriefing interview. The hypothesized structure was tested using combinations of classical test theory and item response theory, following EORTC guidelines. Test-retest assessments and responsiveness to change analysis (RCA) were performed after 2 weeks. Results: Five hundred seventy-two patients (median age 60.3, 54% females) were analyzed. Completion took <10 min for 84%, 40% expressed satisfaction that these issues were addressed. Analyses suggested a revision of the phase III hypothesized scale structure. Two items were deleted based on a high degree of item misfit, together with negative patient feedback. The remaining 15 items formed one eight-item scale named OH-QoL score, a two-item information scale, a two-item scale regarding dentures, and three single items (sticky saliva/mouth soreness/sensitivity to food/drink). Face and convergent validity and internal consistency were confirmed. Test-retest reliability (n = 60) was demonstrated as was RCA for patients undergoing chemotherapy (n = 117; p = 0.06). The resulting QLQ-OH15 discriminated between clinically distinct patient groups, e.g., low performance status vs. higher (p < 0.001), and head-and-neck cancer versus other cancers (p < 0.03). Conclusion: The EORTC module QLQ-OH15 is a short, well-accepted assessment tool focusing on oral problems and QoL to improve clinical management. Trial Registration: ClinicalTrials.gov Identifier: NCT01724333.

Title: Potential risk factors for jaw osteoradionecrosis after radiotherapy for head and neck cancer
Citation: Radiation Oncology, July 2016, vol./is. 11/1(no pagination)

Author(s): Kuhnt T., Stang A., Wienke A., Vordermark D., Schweyen R., Hey J.

Abstract: Introduction: To identify potential risk factors for the development of jaw osteoradionecrosis (ORN) after 3D-conformal radiotherapy (3D-CRT) and intensity-modulated radiotherapy (IMRT) among patients with newly diagnosed head and neck cancer. Material and methods: This study included 776 patients who underwent 3D-CRT or IMRT for head and neck cancer at the Department of Radiotherapy at the University Hospital Halle-Wittenberg between 2003 and 2013. Sex, dental status prior to radiotherapy, tumor site, bone surgery during tumor resection, concomitant chemotherapy, and the development of advanced ORN were documented for each patient. ORN was classified as grade 3, 4, or 5 according to the Radiation Therapy Oncology Group/European Organization for Research and Treatment of Cancer classification or grade 3 or 4 according to the late effects in normal tissues/subjective, objective, management, and analytic scale. The cumulative incidence of ORN was estimated. Cox regression analysis was used to identify prognostic risk factors for the development of ORN. Results: Fifty-one patients developed advanced ORN (relative frequency 6.6 %, cumulative incidence 12.4 %). The highest risk was found in patients who had undergone primary bone surgery during tumor resection (hazard ratio [HR] = 5.87; 95 % confidence interval [CI]: 3.09-11.19) and in patients with tumors located in the oral cavity (HR = 4.69; 95 % CI: 1.33-16.52). Sex, dentition (dentulous vs. edentulous), and chemotherapy had no clinically relevant influence. Discussion and conclusion: In contrast to most previous studies, we noted a low cumulative incidence of advanced ORN. Patients with tumors located in the oral cavity and those who undergo bone surgery during tumor resection prior to RT may be considered a high-risk group for the development of ORN.

Title: Head and neck intensity modulated radiation therapy leads to an increase of opportunistic oral pathogens

Citation: Oral Oncology, July 2016, vol./is. 58/(32-40)


Abstract: Objectives The introduction of intensity modulated radiation therapy (IMRT) has led to new possibilities in the treatment of head and neck cancer (HNC). Limited information is available on how this more advanced radiation technique affects the oral microflora. In a prospective study we assessed the effects of various advanced treatments for HNC on the oral microflora, as well as the effects of elimination of oral foci of infection. Materials and methods All consecutive dentate patients >18 years, diagnosed with a primary oral or oropharynx carcinoma and seen for a pre-treatment dental screening (May 2011-May 2013) were included. Patients were grouped by oncologic treatment: surgery (SURG), IMRT (IMRT) or IMRT+chemotherapy (CHIMRT). Dental screening data, demographic data, subgingival biofilm samples, oral lavages and whole saliva samples were obtained to microbiologically analyze the effects of cancer treatments (1-year follow-up). Results This study included 82
patients (29 SURG, 26 IMRT and 27 CHIMRT). The trends in changes in prevalence and proportions of microorganisms were comparable in the IMRT and CHIMRT group. However, relative to the SURG group, increased prevalence of enteric rods, staphylococci and Candida species was observed in the IMRT and CHIMRT groups. In these groups, elimination of oral foci decreased the frequency of detection of pathogens such as Porphyromonas gingivalis, Tannerella forsythia and Streptococcus mutans. Conclusion Different treatments in HNC patients result in different changes in the oral microflora. Opportunistic pathogens such as staphylococci, enteric rods and Candida sp. tend to increase in prevalence after IMRT with or without chemotherapy, but not after surgical intervention.

Title: Multicenter phase II study of an oral care program for patients with head and neck cancer receiving chemoradiotherapy

Citation: Supportive Care in Cancer, July 2016, vol./is. 24/7(3029-3036)


Abstract: Purpose: This multicenter phase II trial assessed the clinical benefit of a multidisciplinary oral care program in reducing the incidence of severe chemoradiotherapy-induced oral mucositis (OM). Methods: Patients with head and neck cancer (HNC) who were scheduled to receive definitive or postoperative chemoradiotherapy were enrolled. The oral care program included routine oral screening by dentists and a leaflet containing instructions regarding oral care, nutrition, and lifestyle. Oral hygiene and oral care were evaluated continuously during and after the course of chemoradiotherapy. The primary endpoint was the incidence of grade ≥3 OM assessed by certified medical staff according to the Common Terminology Criteria of Adverse Events version 3.0. Results: From April 2012 to December 2013, 120 patients with HNC were enrolled. Sixty-four patients (53.3 %) developed grade ≥3 OM (i.e., functional/symptomatic). The incidence of grade <1 OM at 2 and 4 weeks after radiotherapy completion was 34.2 and 67.6 %, respectively. Clinical examination revealed that 51 patients (42.5 %) developed grade ≥3 OM during chemoradiotherapy. The incidence of grade <1 OM at 2 and 4 weeks after radiotherapy completion was 54.7 and 89.2 %, respectively. The incidences of grade 3 infection and pneumonitis throughout chemoradiotherapy were <5 %. Only 6.7 % of patients had unplanned breaks in radiotherapy, and 99.2 % completed treatment. Conclusions: A systematic oral care program alone is insufficient to decrease the incidence of severe OM in patients with HNC being treated with chemoradiotherapy. However, systematic oral care programs may indirectly improve treatment compliance by decreasing infection risk. Trial registration number: UMIN000006660

Title: Current Concepts in Osteoradionecrosis after Head and Neck Radiotherapy

Citation: Clinical Oncology, July 2016, vol./is. 28/7(459-466)

Author(s): Dhanda J., Pasquier D., Newman L., Shaw R.
Abstract: Osteoradionecrosis (ORN) of the jaws is a feared complication of head and neck radiotherapy. ORN causes significant morbidity for patients and controversy among clinicians. This overview considers the variations in definition and classification of the condition that affect estimates of incidence and also the interpretation of evidence. The influence of newer radiotherapy techniques in reducing ORN through reduced dose and xerostomia is balanced against a probable increase in a vulnerable population through a rising head and neck cancer incidence. Theories of pathophysiology of ORN include radiation-induced osteomyelitis, hypoxic and hypovascular theory and fibroatrophic theory. Prevention strategies include restorative dentistry and radiation planning techniques. Treatments range from conservative 'watch and wait' through to more radical surgical strategies. Newer medical management strategies are available with a limited evidence base. The use of hyperbaric oxygen therapy remains controversial and the background and need for newer hyperbaric oxygen trials is discussed.

Title: Effects of casein phosphopeptide-amorphous calcium phosphate with sodium fluoride on root surface conditions in head and neck radiotherapy patients

Citation: Oral Radiology, July 2016, vol./is. 32/2(105-110)

Author(s): Katsura K., Soga M., Abe E., Matsuyama H., Aoyama H., Hayashi T.

Abstract: Objectives: This study evaluated the effects of combined topical sodium fluoride and casein phosphopeptide-amorphous calcium phosphate (CPP-ACP) paste application on root surface conditions in cancer patients undergoing head and neck radiotherapy. Patients and methods: Nineteen patients undergoing conventional external radiotherapy in head and neck cancer were enrolled and divided into CPP-ACP (topical sodium fluoride/daily CPP-ACP paste application) and Non-CPPACP (topical fluoride application alone) groups. Chronological root surface texture changes were prospectively investigated for 1 year. Results: The mean radiation dose of the parotid gland did not differ significantly between the CPP-ACP and Non-CPPACP groups. From baseline to 6 and 6-12 months, the CPPACP group had significantly better root surface textures than those in the Non-CPPACP group (p = 0.001 and p < 0.001, respectively). The hard surface numbers in the CPP-ACP group increased from 347 to 350 in 12 months. The respective soft lesion incidence rates from baseline to 6, 6-12, and baseline to 12 months were significantly lower in the CPP-ACP group than those in the Non-CPP-ACP group (per patient: p = 0.038, p = 0.038, and p = 0.029; per root surface: p = 0.026, p < 0.001, and p < 0.001). Conclusions: The present results suggest that dental management with a combination of topical sodium fluoride and CPP-ACP paste application can control root surface caries more effectively than topical sodium fluoride alone in patients undergoing head and neck radiotherapy.

Dental implants

Title: Role of implant configurations supporting three-unit fixed partial denture on mandibular bone response: biological-data-based finite element study.
Abstract: Implant-supported fixed partial denture with cantilever extension can transfer the excessive load to the bone around implants and stress/strain concentration potentially leading to bone resorption. This study investigated the effects of implant configurations supporting three-unit fixed partial denture (FPD) on the stress and strain distribution in the peri-implant bone by combining clinically measured time-dependent loading data and finite element (FE) analysis. A 3-dimensional mandibular model was constructed based on computed tomography (CT) images. Four different configurations of implants supporting 3-unit FPDs, namely three implant-supported FPD, conventional three-unit bridge FPD, distal cantilever FPD and mesial cantilever FPD, were modelled. The FPDs were virtually inserted to the molar area in the mandibular FE models. The FPDs were loaded according to time-dependent in vivo-measured 3-dimensional loading data during chewing. The von Mises stress (VMS) and equivalent strain (EQS) in peri-implant bone regions were evaluated as mechanical stimuli. During the chewing cycles, the regions near implant necks and bottom apexes experienced high VMS and EQS than the middle regions in all implant-supported FPD configurations. Higher VMS and EQS values were also observed at the implant neck region adjacent to the cantilever extension in the cantilevered configurations. The patient-specific dynamic loading data and CT-based reconstruction of full 3D mandibular allowed us to model the biomechanical responses more realistically. The results provided data for clinical assessment of implant configuration to improve longevity and reliability of the implant-supported FPD restoration. © 2016 John Wiley & Sons Ltd.

Title: Turned versus anodised dental implants: a meta-analysis.

Abstract: The aim of this meta-analysis was to test the null hypothesis of no difference in the implant failure rates, marginal bone loss (MBL) and post-operative infection for patients being rehabilitated by turned versus anodised-surface implants, against the alternative hypothesis of a difference. An electronic search without time or language restrictions was undertaken in November 2015. Eligibility criteria included clinical human studies, either randomised or not. Thirty-eight publications were included. The results suggest a risk ratio of 2.82 (95% CI 1.95-4.06, P < 0.00001) for failure of turned implants, when compared to anodised-surface implants. Sensitivity analyses showed similar results when only the studies inserting implants in maxillae or mandibles were pooled. There were no statistically significant effects of turned implants on the MBL (mean difference-MD 0.02, 95%CI -0.16-0.20; P = 0.82) in comparison to anodised implants. The results of a meta-regression considering the follow-up period as a covariate suggested an increase of the MD with the increase in the follow-up time (MD increase 0.012 mm year(-1) ), however, without a statistical significance (P = 0.813). Due to lack of satisfactory information, meta-analysis for the outcome 'post-operative infection' was not performed. The results have to be
interpreted with caution due to the presence of several confounding factors in the included studies. © 2016 John Wiley & Sons Ltd.

**Title:** Biomechanical evaluation of one-piece and two-piece small-diameter dental implants: In-vitro experimental and three-dimensional finite element analyses.

**Citation:** Journal of the Formosan Medical Association = Taiwan yi zhi, Sep 2016, vol. 115, no. 9, p. 794-800

**Author(s):** Wu, Aaron Yu-Jen, Hsu, Jui-Ting, Chee, Winston, Lin, Yun-Te, Fuh, Lih-Jyh, Huang, Heng-Li

**Abstract:** Small-diameter dental implants are associated with a higher risk of implant failure. This study used both three-dimensional finite-element (FE) simulations and in-vitro experimental tests to analyze the stresses and strains in both the implant and the surrounding bone when using one-piece (NobelDirect) and two-piece (NobelReplace) small-diameter implants, with the aim of understanding the underlying biomechanical mechanisms. Six experimental artificial jawbone models and two FE models were prepared for one-piece and two-piece 3.5-mm diameter implants. Rosette strain gauges were used for in-vitro tests, with peak values of the principal bone strain recorded with a data acquisition system. Implant stability as quantified by Periotest values (PTV) were also recorded for both types of implants. Experimental data were analyzed statistically using Wilcoxon’s rank-sum test. In FE simulations, the peak value and distribution of von-Mises stresses in the implant and bone were selected for evaluation. In in-vitro tests, the peak bone strain was 42% lower for two-piece implants than for one-piece implants. The PTV was slightly lower for one-piece implants (PTV = -6) than for two-piece implants (PTV = -5). In FE simulations, the stresses in the bone and implant were about 23% higher and 12% lower, respectively, for one-piece implants than those for two-piece implants. Due to the higher peri-implant bone stresses and strains, one-piece implants (NobelDirect) might be not suitable for use as small-diameter implants. Copyright © 2016. Published by Elsevier B.V.

**Title:** Random spectrum loading of dental implants: An alternative approach to functional performance assessment.

**Citation:** Journal of the mechanical behavior of biomedical materials, Sep 2016, vol. 62, p. 1-9,

**Author(s):** Shemtov-Yona, K, Rittel, D

**Abstract:** The fatigue performance of dental implants is usually assessed on the basis of cyclic S/N curves. This neither provides information on the anticipated service performance of the implant, nor does it allow for detailed comparisons between implants unless a thorough statistical analysis is performed, of the kind not currently required by certification standards. The notion of endurance limit is deemed to be of limited applicability, given unavoidable stress concentrations and random load excursions, that all characterize dental implants and their service conditions. We propose a completely different approach, based on random spectrum loading, as long used in aeronautical design. The implant is randomly
loaded by a sequence of loads encompassing all load levels it would endure during its service life. This approach provides a quantitative and comparable estimate of its performance in terms of lifetime, based on the very fact that the implant will fracture sooner or later, instead of defining a fatigue endurance limit of limited practical application. Five commercial monolithic Ti-6Al-4V implants were tested under cyclic, and another 5 under spectrum loading conditions, at room temperature and dry air. The failure modes and fracture planes were identical for all implants. The approach is discussed, including its potential applications, for systematic, straightforward and reliable comparisons of various implant designs and environments, without the need for cumbersome statistical analyses. It is believed that spectrum loading can be considered for the generation of new standardization procedures and design applications. Copyright © 2016 Elsevier Ltd. All rights reserved.

Title: Highly wear-resistant and biocompatible carbon nanocomposite coatings for dental implants.

Citation: Biomaterials, Sep 2016, vol. 102, p. 130-136

Author(s): Penkov, Oleksiy V, Pukha, Vladimir E, Starikova, Svetlana L, Khadem, Mahdi, Starikov, Vadym V, Maleev, Maxim V, Kim, Dae-Eun

Abstract: Diamond-like carbon coatings are increasingly used as wear-protective coatings for dental implants, artificial joints, etc. Despite their advantages, they may have several weak points such as high internal stress, poor adhesive properties or high sensitivity to ambient conditions. These weak points could be overcome in the case of a new carbon nanocomposite coating (CNC) deposited by using a C60 ion beam on a Co/Cr alloy. The structure of the coatings was investigated by Raman and XPS spectroscopy. The wear resistance was assessed by using a reciprocating tribotester under the loads up to 0.4 N in both dry and wet sliding conditions. Biocompatibility of the dental implants was tested in vivo on rabbits. Biocompatibility, bioactivity and mechanical durability of the CNC deposited on a Co/Cr alloy were investigated and compared with those of bulk Co/Cr and Ti alloys. The wear resistance of the CNC was found to be 250-650 fold higher compared to the Co/Cr and Ti alloys. Also, the CNC demonstrated much better biological properties with respect to formation of new tissues and absence of negative morphological parameters such as necrosis and demineralization. Development of the CNC is expected to aid in significant improvement of lifetime and quality of implants for dental applications. Copyright © 2016 Elsevier Ltd. All rights reserved.

Title: Fatigue failure of dental implants in simulated intraoral media

Citation: Journal of the Mechanical Behavior of Biomedical Materials, September 2016, vol./is. 62/(636-644)

Author(s): Shemtov-Yona K., Rittel D.

Abstract: Metallic dental implants are exposed to various intraoral environments and repetitive loads during service. Relatively few studies have systematically addressed the
potential influence of the environment on the mechanical integrity of the implants, which is therefore the subject of this study. Four media (groups) were selected for room temperature testing, namely dry air, saliva substitute, same with 250 ppm of fluoride, and saline solution (0.9%). Monolithic Ti-6Al-4V implants were loaded until fracture, using random spectrum loading. The study reveals that the only aggressive medium of all is the saline solution, as it shortens significantly the spectrum fatigue life of the implants. The quantitative scanning electron fractographic analysis indicates that all the tested implants grew fatigue cracks of similar lengths prior to catastrophic fracture. However, the average crack growth rate in the saline medium was found to largely exceed that in other media, suggesting a decreased fracture toughness. The notion of a characteristic timescale for environmental degradation was proposed to explain the results of our spectrum tests that blend randomly low and high cycle fatigue. Random spectrum fatigue testing is a powerful technique to assess and compare the mechanical performance of dental implants for various designs and/or environments.

Title: Osseointegration behavior of novel Ti-Nb-Zr-Ta-Si alloy for dental implants: an in vivo study.

Citation: Journal of materials science. Materials in medicine, Sep 2016, vol. 27, no. 9, p. 139.

Author(s): Wang, Xiaona, Meng, Xing, Chu, Shunli, Xiang, Xingchen, Liu, Zhenzhen, Zhao, Jinghui, Zhou, Yanmin

Abstract: This study aimed to evaluate the effects of Ti-Nb-Zr-Ta-Si alloy implants on mineral apposition rate and new BIC contact in rabbits. Twelve Ti-Nb-Zr-Ta-Si alloy implants were fabricated and placed into the right femur sites in six rabbits, and commercially pure titanium implants were used as controls in the left femur. Tetracycline and alizarin red were administered 3 weeks and 1 week before euthanization, respectively. At 4 weeks and 8 weeks after implantation, animals were euthanized, respectively. Surface characterization and implant-bone contact surface analysis were performed by using a scanning electron microscope and an energy dispersive X-ray detector. Mineral apposition rate was evaluated using a confocal laser scanning microscope. Toluidine blue staining was performed on undecalcified sections for histology and histomorphology evaluation. Scanning electron microscope and histomorphology observation revealed a direct contact between implants and bone of all groups. After a healing period of 4 weeks, Ti-Nb-Zr-Ta-Si alloy implants showed significantly higher mineral apposition rate compared to commercially pure titanium implants (P < 0.05), whereas there was no significant difference between Ti-Nb-Zr-Ta-Si alloy implants and commercially pure titanium implants (P > 0.05) at 8 weeks. No significant difference of bone-to-implant contact was observed between Ti-Nb-Zr-Ta-Si alloy implants and commercially pure titanium implants implants after a healing period of 4 weeks and 8 weeks. This study showed that Ti-Nb-Zr-Ta-Si alloy implants could establish a close direct contact compared to commercially pure titanium implants implants, improved mineral matrix apposition rate, and may someday be an alternative as a material for dental implants.

Title: Graftless sinus augmentation with simultaneous dental implant placement: clinical results and biological perspectives.
**Citation:** International journal of oral and maxillofacial surgery, Sep 2016, vol. 45, no. 9, p. 1147-1153

**Author(s):** Falah, M, Sohn, D-S, Srouji, S

**Abstract:** After a sinus lifting procedure, the compartment around the implants under the sinus mucosal lining in the sinus floor is filled with a blood clot from surrounding bleeding. The aim of this study was to evaluate the feasibility of bone formation following graftless sinus lifting with the simultaneous placement of dental implants. Thirty graftless sinus lifting procedures were performed and 72 dental implants placed in 18 consecutive patients, using the lateral window approach. Clinical and radiological follow-up was conducted throughout the 6-month healing period. Biopsies of 30 cases were collected at 6 months post-treatment: 15 biopsies were taken from the newly formed bone near the basal floor and 15 from the newly formed bone near the elevated membrane. New bone consolidation in the maxillary sinus was apparent radiologically and histologically at 6 months after sinus augmentation, providing an average 6.14±1.34mm of bone-gain. Based on histological analysis and histomorphometric data, the consolidated bone in the augmented sinus comprised 56.7±11.9% to 59.9±13.4% vital bone tissue. Out of the 72 implants placed, only four failed, indicating a 94% overall implant survival rate. Based on this case series, blood clot can be considered autologous osteogenic graft material, to which osteoprogenitors can migrate, differentiate, and regenerate bone. Copyright © 2016 The Author(s). Published by Elsevier Ltd.. All rights reserved.

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**Title:** Bone Response to Four Dental Implants with Different Surface Topographies: A Histologic and Histometric Study in Minipigs.

**Citation:** The International journal of periodontics & restorative dentistry, Sep 2016, vol. 36, no. 5, p. 745-754

**Author(s):** Kalema, Zamira, Scarano, Antonio, Valbonetti, Luca, Rapone, Biagio, Grassi, Felice Roberto

**Abstract:** This study evaluated four implant surfaces in a minipig model: (1) Kohno Straight dual-engineered surface (DES) (Sweden & Martina); (2) SLActive (Straumann); (3) SM Biotite-H coated with Brushite (DIO); and (4) UF hybrid sandblasted and acid etched (HAS) (DIO). The surfaces presented different topographic features on the macro-, micro-, and nanoscales. After 12 weeks in vivo, significant differences were observed in bone-to-implant contact. UF HAS, presenting moderate microroughness and high nanoroughness, showed some advantage compared to nanorough SM Biotite-H and SLActive. A more pronounced difference was observed between UF HAS and Kohno Straight DES, characterized by a nanosmooth surface. Newly formed bone was observed around all surfaces.

**Title:** Reconstruction of Extended and Morphologically Varied Alveolar Ridge Defects with the Titanium Mesh Technique: Clinical and Dental Implants Outcomes.
Citation: The International journal of periodontics & restorative dentistry, Sep 2016, vol. 36, no. 5, p. 689-697

Author(s): Lizio, Giuseppe, Mazzone, Noemi, Corinaldesi, Giuseppe, Marchetti, Claudio

Abstract: A sample of 24 patients with varied morphologic defects were treated with 34 titanium meshes and particulate bone and rehabilitated at least 8 to 9 months thereafter with the placement of 88 implants. Of the 34 meshes, 4 had to be removed before implant placement (11.76% total failure) and 20 were exposed due to soft tissue dehiscence (58.82% of complications): 4 (11.77%) prematurely (within 4 to 6 weeks) and 16 (47.05%) delayed (after 4 to 6 weeks), with no compromise in implant placement. None of the 88 implants was lost (100% implant survival), and 15 demonstrated increased bone loss, yielding a cumulative implant success rate of 82.9%. This technique appears useful in treating extended and morphologically varied alveolar defects.

Title: Effects of varied cortical shells and tooth situations to the structure resonance in dental implantation

Citation: Journal of Medical Devices, Transactions of the ASME, September 2016, vol./is. 10/3(1-2)

Author(s): Cong T.M., Chen C.-S., Pan M.-C.

Publication Type: Journal: Article

Title: Highly wear-resistant and biocompatible carbon nanocomposite coatings for dental implants

Citation: Biomaterials, September 2016, vol./is. 102/(130-136)

Author(s): Penkov O.V., Pukha V.E., Starikova S.L., Khadem M., Starikov V.V., Maleev M.V., Kim D.-E.

Abstract: Diamond-like carbon coatings are increasingly used as wear-protective coatings for dental implants, artificial joints, etc. Despite their advantages, they may have several weak points such as high internal stress, poor adhesive properties or high sensitivity to ambient conditions. These weak points could be overcome in the case of a new carbon nanocomposite coating (CNC) deposited by using a C<inf>60</inf> ion beam on a Co/Cr alloy. The structure of the coatings was investigated by Raman and XPS spectroscopy. The wear resistance was assessed by using a reciprocating tribotester under the loads up to 0.4 N in both dry and wet sliding conditions. Biocompatibility of the dental implants was tested in vivo on rabbits. Biocompatibility, bioactivity and mechanical durability of the CNC deposited on a Co/Cr alloy were investigated and compared with those of bulk Co/Cr and Ti alloys. The wear resistance of the CNC was found to be 250-650 fold higher compared to the Co/Cr and Ti alloys. Also, the CNC demonstrated much better biological properties with respect to formation of new tissues and absence of negative morphological parameters such
as necrosis and demineralization. Development of the CNC is expected to aid in significant improvement of lifetime and quality of implants for dental applications.

Title: Fatigue failure of dental implants in simulated intraoral media.

Citation: Journal of the mechanical behavior of biomedical materials, Sep 2016, vol. 62, p. 636-644

Author(s): Shemtov-Yona, K, Rittel, D

Abstract: Metallic dental implants are exposed to various intraoral environments and repetitive loads during service. Relatively few studies have systematically addressed the potential influence of the environment on the mechanical integrity of the implants, which is therefore the subject of this study. Four media (groups) were selected for room temperature testing, namely dry air, saliva substitute, same with 250ppm of fluoride, and saline solution (0.9%). Monolithic Ti-6Al-4V implants were loaded until fracture, using random spectrum loading. The study reveals that the only aggressive medium of all is the saline solution, as it shortens significantly the spectrum fatigue life of the implants. The quantitative scanning electron fractographic analysis indicates that all the tested implants grew fatigue cracks of similar lengths prior to catastrophic fracture. However, the average crack growth rate in the saline medium was found to largely exceed that in other media, suggesting a decreased fracture toughness. The notion of a characteristic timescale for environmental degradation was proposed to explain the results of our spectrum tests that blend randomly low and high cycle fatigue. Random spectrum fatigue testing is powerful technique to assess and compare the mechanical performance of dental implants for various designs and/or environments. Copyright © 2016 Elsevier Ltd. All rights reserved.

Title: Microstructure and mechanical properties of Ti-15Zr alloy used as dental implant material.

Citation: Journal of the mechanical behavior of biomedical materials, Sep 2016, vol. 62, p. 384-398

Author(s): Medvedev, Alexander E, Molotnikov, Andrey, Lapovok, Rimma, Zeller, Rolf, Berner, Simon, Habersetzer, Philippe, Dalla Torre, Florian

Abstract: Ti-Zr alloys have recently started to receive a considerable amount of attention as promising materials for dental applications. This work compares mechanical properties of a new Ti-15Zr alloy to those of commercially pure titanium Grade4 in two surface conditions - machined and modified by sand-blasting and etching (SLA). As a result of significantly smaller grain size in the initial condition (1-2µm), the strength of Ti-15Zr alloy was found to be 10-15% higher than that of Grade4 titanium without reduction in the tensile elongation or compromising the fracture toughness. The fatigue endurance limit of the alloy was increased by around 30% (560MPa vs. 435MPa and 500MPa vs. 380MPa for machined and SLA-treated surfaces, respectively). Additional implant fatigue tests showed enhanced fatigue performance of Ti-15Zr over Ti-Grade4. Copyright © 2016 Elsevier Ltd. All rights reserved.
Title: Experimental study on penetration of dental implants into the maxillary sinus at different depths.

Citation: Oral and maxillofacial surgery, Sep 2016, vol. 20, no. 3, p. 281-287

Author(s): Elhamruni, Lutfi Mohamed Mohamed, Marzook, Hamdy Abdelmegeed Mohamed, Ahmed, Wael Mohamed Said, Abdul-Rahman, Mohamed

Abstract: The purpose of this study was to investigate the effect of the dental implant penetration into the maxillary sinus cavity in different depths on implant and sinus health in a dog model. The study sample included eight titanium dental implant placed in four female dogs immediately after extraction of the first maxillary molar in the palatal socket and assigned into four groups according to the protruding of implant tips (control group A = 0 mm, and study groups B, C, and D with protrusion of 1, 2, and 3 mm, respectively). The bone blocks of the implants were harvested 5 months postoperatively and evaluated by cone beam computed tomography (CBCT) and histological analysis. The whole groups showed no signs of inflammation during the 5-month period of the study. The tips of the implants in group B with penetrating depths of 1 mm were found to be fully covered with newly formed bone. The tips of the implants in group C with penetrating depths of 2 mm were exposed in the sinus cavity and showed partially new bone coverage, while depths of 3 mm in group D were found to have no bone formation and the dental implant fixture sites were communicated with the sinus cavity. No significant differences were found among the groups regarding implant stability. Despite the protrusion extents, penetration of dental implant into the maxillary sinus with membrane perforation does not compromise the sinus health and the implant in canine.

Title: Temperature evaluation of dental implant surface irradiated with high-power diode laser.

Citation: Lasers in medical science, Sep 2016, vol. 31, no. 7, p. 1309-1316


Abstract: The prevalence of peri-implantitis and the absence of a standard approach for decontamination of the dental implant surface have led to searches for effective therapies. Since the source of diode lasers is portable, has reduced cost, and does not cause damage to the titanium surface of the implant, high-power diode lasers have been used for this purpose. The effect of laser irradiation on the implants is the elevation of the temperature surface. If this elevation exceeds 47 °C, the bone tissue is irreversibly damaged, so for a safety therapy, the laser parameters should be controlled. In this study, a diode laser of GaAsAl was used to irradiate titanium dental implants, for powers 1.32 to 2.64 W (real) or 2.00 to 4.00 W (nominal), in continuous/pulsed mode DC/AC, with exposure time of 5/10 s, with/without air flow for cooling. The elevation of the temperature was monitored in real time in two positions: cervical and apical. The best results for decontamination using a 968-nm diode laser were obtained for a power of 1.65 and 1.98 W (real) for 10 s, in DC or AC mode, with an air flow of 2.5 l/min. In our perspective in this article, we determine a
suggested approach for decontamination of the dental implant surface using a 968-nm diode laser.

**Title:** Three-Dimensional buccal bone anatomy and aesthetic outcome of single dental implants replacing maxillary incisors.

**Citation:** Clinical oral implants research, Aug 2016, vol. 27, no. 8, p. 956-963

**Author(s):** Veltri, Mario, Ekestubbe, Annika, Abrahamsson, Ingemar, Wennström, Jan L

**Abstract:** This case series investigated by means of CBCT, buccal bone three-dimensional anatomy at delayed, two-stage implants in the maxillary incisal tooth region. Moreover, the relation between buccal bone anatomy and soft tissue aesthetics was assessed. Twelve implants were analysed after on average 8.9 years in function. Baseline and re-evaluation photographs were assessed using the pink aesthetic score (PES). Marginal bone changes were measured from intraoral X-rays. The buccal bone volume associated with the implant and the implant surface not covered by visible buccal bone was computed on CBCT data sets. Buccal bone thickness and level were assessed, as well as the thickness of the crest distally and mesially of the implant. Changes in soft tissue forms and correlation between aesthetics and bone anatomy were calculated by nonparametric statistics. Buccal bone level was located 3.8 mm apical of the implant shoulder, and none of the implants had complete bone coverage. Buccal bone volume was 144.3 mm$^3$, and 4.29 mm$^3$ in the more coronal 2 mm portion. PES did not differ at re-evaluation (9.7) and baseline (9.2). PES was directly correlated with crestal thickness mesially and distally of the implant shoulder. No other significant correlations were observed between bone anatomy and PES or buccal peri-implant health. Marginal bone gain over time was associated with greater coronal bone volume buccally and with greater buccal and marginal bone thickness, while loss was related to less or no bone. Within present limitations, acceptable and stable aesthetics are not jeopardized by a thin or missing buccal bone. © 2015 John Wiley & Sons A/S. Published by John Wiley & Sons Ltd.

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**Title:** Early loading of splinted implants supporting a two-unit fixed partial denture in the posterior maxilla: 13-month results from a randomized controlled clinical trial of two different implant systems.

**Citation:** Clinical oral implants research, Aug 2016, vol. 27, no. 8, p. 1017-1025

**Author(s):** Ryu, Hyo-Sook, Namgung, Cheol, Heo, Young-Ku, Lee, Jong-Ho, Lim, Young-Jun

**Abstract:** The aim of this study was to evaluate early-loaded implants supporting a two-unit fixed dental prosthesis in the posterior maxilla and to compare the clinical and radiological outcomes of two different implant systems in terms of success rates, implant stability quotient (ISQ) values, and peri-implant parameters. Thirty patients with the unilateral loss of two consecutive maxillary posterior teeth were randomly assigned to two different implant systems: SLActive Bone level implant (Institut Straumann AG, Basel, Switzerland) in the control group and CMI IS-II active implant (Neobiotech Co., Seoul, Korea) in the experimental group. The patients received provisional and definitive two-unit fixed
prostheses at 4 weeks and 6 months after implant surgery, respectively. The peak insertion torque was recorded at surgery. The stability of each implant was evaluated during surgery and at 2, 3, and 4 weeks and 6 and 13 months after implant placement by means of ISQ values. In addition, periapical radiographs and peri-implant parameters were taken throughout the trial. Overall, comparable results were obtained between the control and experimental groups in terms of insertion torque, ISQ values, marginal bone loss, and peri-implant soft tissue parameters. All 60 implants had 100% of success rate. The average insertion torque was 36.83 ± 6.09 (control) and 35.33 ± 3.20 (test) Ncm. The ISQ values remained steady until 4 weeks and then increased with statistical significance during 4 weeks to 13 months after surgery. Both groups exhibited no stability dip during the early phase of healing. The average marginal bone loss from the baseline of implant placement for the control and experimental groups was 0.38 and 0.45 mm after 4 weeks and 0.98 and 0.61 mm after 13 months. All of the soft tissue parameters were within normal limits. The results of this study indicate that the concept of early loading at 4 weeks after placement in the posterior maxilla can be an effective treatment option, even in the areas of low bone density, when implants satisfy the inclusion criteria of minimum insertion torque and ISQ of 30 Ncm and 65, respectively. © 2015 John Wiley & Sons A/S. Published by John Wiley & Sons Ltd.

Title: Analysis of titanium and other metals in human jawbones with dental implants - A case series study.

Citation: Dental materials : official publication of the Academy of Dental Materials, Aug 2016, vol. 32, no. 8, p. 1042-1051

Author(s): He, Xiuli, Reichl, Franz-Xaver, Wang, Yan, Michalke, Bernhard, Milz, Stefan, Yang, Yang, Stolper, Philipp, Lindemaier, Gabriele, Graw, Matthias, Hickel, Reinhard, Högg, Christof

Abstract: The aim of this study was to measure titanium (Ti) content in human jawbones and to show that Ti was released from dental implants inserted into these jawbones. Seven samples from four human subjects with dental implants were analysed as test group and six bone samples of similar topographical regions from six human subjects without implants served as control. The contents of various elements in human jawbones were detected by inductively coupled plasma optical emission spectrometry. The distributions of various isotopes in human mandibular bone were measured with laser ablation-inductively coupled plasma-mass spectrometry (LA-ICP-MS). Histological analyses of undecalcified, Giemsa-Eosin stained mandible sections were performed by light microscopy and particles were identified in human bone marrow by scanning electron microscope-energy dispersive X-ray analysis. In test group only Ti content was significantly higher compared to control group. The mean contents of Ti were 1940μg/kg in test group and 634μg/kg in control group. The highest Ti content detected in human mandibular bone was 37,700μg/kg-bone weight. In samples 4-7 (human subjects II-IV), increased Ti intensity was also detected by LA-ICP-MS in human mandibular tissues at a distance of 556-1587μm from implants, and the intensity increased with decreasing distance from implants. Particles with sizes of 0.5-40μm were found in human jawbone marrow tissues at distances of 60-700μm from implants in samples 4-7. Ti released from dental implants can be detected in human mandibular bone and bone
marrow tissues, and the distribution of Ti in human bone was related to the distance to the implant. Copyright © 2016 The Academy of Dental Materials. Published by Elsevier Ltd. All rights reserved.

**Title:** Dental implants treatment outcomes in patient under active therapy with alendronate: 3-year follow-up results of a multicenter prospective observational study.

**Citation:** Clinical oral implants research, Aug 2016, vol. 27, no. 8, p. 943-949

**Author(s):** Tallarico, Marco, Canullo, Luigi, Xhanari, Ertan, Meloni, Silvio Mario

**Abstract:** To evaluate the 3-year clinical and radiographic data of fixed implant-supported dental prosthesis delivered to patients having taken alendronate 35-70 mg weekly for at least 3 years before implant placement. Forty consecutive patients treated with oral bisphosphonates and requiring an implant-supported restoration were recruited in two private centers between January 2008 and December 2011. Implants were inserted through minimally invasive approach under antibacterial and antibiotic treatment, 6 months after alendronate administration stopping. After 4 months of submerged healing, implants underwent prosthetic loading. Hygiene maintenance and clinical assessments were scheduled every 4 months for 3 years. Outcome measures were the following: implant and prosthetic success, survival rates, any observed clinical complications, marginal bone remodeling, probing pocket depth and bleeding-on-probing. At the end of the study, eight patients dropped out. The final sample size resulted in 32 consecutive partially or fully edentulous patients (32 females; mean age 64.6 years) with 98 submerged implants. In only one patient, maxillary implant failed during healing period. No prosthesis failed during the entire follow-up, and no major complications were recorded. Implant and prostheses success resulted in an overall survival rate of 98, 98% and 100%, respectively. Three-year mean marginal bone loss was 1.35 ± 0.21 (CI 95% 1.24-1.38). Successful soft tissue parameters were found around all implants. Oral bisphosphonate therapy did not appear to significantly affect implant survival and success in case of accurate treatment time selection, minimally invasive surgical approach and constant follow-up. Further prospective studies involving larger sample sizes and longer durations of follow-up are required to confirm these results. © 2015 John Wiley & Sons A/S. Published by John Wiley & Sons Ltd.

**Title:** Comparing Two Diagnostic Procedures in Planning Dental Implants to Support a Mandibular Free-Ending Removable Partial Denture.

**Citation:** Clinical implant dentistry and related research, Aug 2016, vol. 18, no. 4, p. 678-685

**Author(s):** Jensen, Charlotte, Raghoebar, Gerry M, Meijer, Henny J A, Schepers, Rutger, Cune, Marco S

**Abstract:** The use of a cone beam computed tomography (CBCT) for the preoperative implant planning is increasing. A clear guideline is needed in which cases of CBCT is essential. In this study, two imaging modalities (panoramic radiograph and CBCT) are compared in preoperative implant planning in the severely resorbed mandible and the influence on the observers assessments. Thirty-four consecutive patients with bilateral
edentulous regions in the mandible were included. The feasibility of implant placement in the premolar and molar region was judged by three observers on basis of casts either with a panoramic radiograph or a CBCT. Cohen’s kappa, sensitivity and specificity rates, odds of agreement and disagreement as well as the odds ratios (ORs, ratio between odds of agreement and disagreement) were calculated per observer and overall for all observers assuming the majorities agreement as the prevailing opinion. Overall outcome for premolar region revealed true-positive and true-negative rates of 90% and 0%, respectively, with Cohen's kappa (κ) = -0.04. The ORs for the three observers varied between 2.6 and 158.8, with an overall OR = 76. For the molar region, overall true-positive and true-negative rates were 65% and 22% respectively, with Cohen's κ = 0.68, representing a reasonable amount of agreement. Sensitivity and specificity as well as the ORs for individual observers were fairly consistent with an overall OR = 43. Implant placement in the resorbed posterior mandible can be well assessed with a cast in combination with a panoramic radiograph in the vast majority of the cases. Misclassification amounts to approximately 10% to 13%. In all cases of misclassification, a critical bone height, or an unclear course of the mandibular nerve or a knife edge ridge was present. In these cases, the use of a CBCT is justified. © 2015 Wiley Periodicals, Inc.

**Title:** Immediate Loading of Dental Implants in Edentulous Mandibles by Use of Locator® Attachments or Dolder® Bars: Two-Year Results from a Prospective Randomized Clinical Study.

**Citation:** Clinical implant dentistry and related research, Aug 2016, vol. 18, no. 4, p. 752-761

**Author(s):** Kappel, Stefanie, Giannakopoulos, Nikolaos Nikitas, Eberhard, Lydia, Rammelsberg, Peter, Eiffier, Constantin

**Abstract:** The study aims to evaluate survival and incidence of complications for pairs of implants placed in the front region of edentulous mandibles and immediately loaded with either bar or Locator attachments. Forty-six patients with edentulous mandibles (mean age 69.4 years at inclusion in the study; 73.9% male) received two implants in the interforaminal area of the symphysis. Dolder bar or Locator attachments, allocated randomly, were then attached immediately, and both clips and a framework were fastened to the denture by the dental technician within 72 hours. During the first 3 months of the 2-year period of observation, eight implants in five patients were lost, and were removed. Survival was 89.1% and 93.5% for the bar and Locator groups, respectively. During the entire period of observation, 38 prosthetic complications required aftercare. Five dentures had to be removed or reworked after implant failure, but no superstructure was lost or had to be remade for prosthetic reasons. Survival of the original dentures was 93.5% and 95.7% for the bar and Locator groups, respectively. Within the limitations of this study, results from immediate loading of two implants in the edentulous mandible with either Locator or bar attachments hardly differed. Prosthetic complications and aftercare measures in the Locator group were frequent but easy to handle. Ease of repair and cleaning, in particular, might be reasons for choosing the single-attachment system. © 2015 Wiley Periodicals, Inc.

**Title:** A new device for improving dental implants anchorage: a histological and micro-computed tomography study in the rabbit.
**Citation:** Clinical oral implants research, Aug 2016, vol. 27, no. 8, p. 935-942

**Author(s):** Barak, Shlomo, Neuman, Moshe, Iezzi, Giovanna, Piattelli, Adriano, Perrotti, Vittoria, Gabet, Yankel

**Abstract:** In the present study, a new healing cap that could generate a pulsed electromagnetic field (PEMF) around titanium implants to stimulate peri-implant osteogenesis was tested in the rabbit model. A total of 22 implants were inserted in the proximal tibial metaphysis of 22 rabbits. A healing cap containing the active device was inserted in half of the implants (11 test implants); an "empty" healing cap was inserted in the other ones (11 control implants). The animals were euthanized after 2 and 4 weeks, and the samples were processed for micro-computed tomography and histology. The peri-implant volume was divided into coronal (where the PEMF was the strongest) and apical regions. Most of the effects of the tested device were confined to the coronal region. Two weeks post-implantation, test implants showed a significant 56% higher trabecular bone fraction (BV/TV), associated with enhanced trabecular number (Tb.N, +37%) and connectivity density (Conn.D, +73%) as compared to the control group; at 4 weeks, the PEMF induced a 69% increase in BV/TV and 34% increase of Tb.N. There was no difference in the trabecular thickness (Tb.Th) at either time point. Furthermore, we observed a 48% higher bone-to-implant contact (BIC) in the test implants vs. controls after 2 weeks; this increase tended to remain stable until the fourth week. Mature trabecular and woven bone were observed in direct contact with the implant surface with no gaps or connective tissue at the bone-implant interface. These results indicate that the PEMF device stimulated early bone formation around dental implants resulting in higher peri-implant BIC and bone mass already after 2 weeks which suggests an acceleration of the osseointegration process by more than three times. © 2015 John Wiley & Sons A/S. Published by John Wiley & Sons Ltd.

**Title:** Effects of a Low-Intensity Laser on Dental Implant Osseointegration: Removal Torque and Resonance Frequency Analysis in Rabbits.

**Citation:** The Journal of oral implantology, Aug 2016, vol. 42, no. 4, p. 316-320

**Author(s):** Blay, Alberto, Blay, Claudia C, Tunchel, Samy, Gehrke, Sergio Alexandre, Shibli, Jamil Awad, Groth, Eduardo B, Zezell, Denise M

**Abstract:** The objective of this study was to investigate how a low-intensity laser affects the stability and reverse torque resistance of dental implants installed in the tibia of rabbits. Thirty rabbits received 60 dental implants with the same design and surface treatment, one in each proximal metaphysis of the tibia. Three groups were prepared (n = 10 animals each): conventional osseointegration without treatment (control group), surgical sites irradiated with a laser beam emitted in the visible range of 680 nm (Lg1 group), surgical sites irradiated with a laser beam with a wavelength in the infrared range of 830 nm (Lg2 group). Ten irradiation sessions were performed 48 hours apart; the first session was during the immediate postoperative period. Irradiation energy density was 4 J/cm(2) per point in 2 points on each side of the tibias. The resonance frequency and removal torque values were measured at 2 time points after the implantations (3 and 6 weeks). Both laser groups (Lg1
and Lg2) presented a significant difference between resonance frequency analysis values at the baseline and the values obtained after 3 and 6 weeks (P > .05). Although the removal torque values of all groups increased after 6 weeks (P < .05), both laser groups presented greater mean values than those of the control group (P < .01). Photobiomodulation using laser irradiation with wavelengths of 680 and 830 nm had a better degree of bone integration than the control group after 6 weeks of observation time.

**Title:** Analysis of Bone Height Changes after Maxillary Sinus Augmentation with Simultaneous and Delayed Placement of Dental Implants: A Clinical and Radiographic Study.

**Citation:** Journal of prosthodontics : official journal of the American College of Prosthodontists, Aug 2016, vol. 25, no. 6, p. 440-445

**Author(s):** Yin, Lihua, Yu, Zhanhai, Chen, Zhuofan, Huang, Baoxin, Zhang, Kailiang, Zhou, Ailing, Li, Xiangxin

**Abstract:** To retrospectively assess the changes of the vertical height of the maxillary sinus floor after augmentation with simultaneous and delayed placement of implants. In total, 38 patients with 76 implants were involved; vertical bone height of the sinus floor was radiographically measured at different stages including preoperation, immediately postsurgery, 6 and 12 months postsurgery, and 6 and 24 months postfunctional loading. Sinus augmentation significantly increased vertical bone height of the sinus floor for both the simultaneous and delayed groups. The survival rate was 100% in the simultaneous group and 95.46% in the delayed group. For simultaneous placement, the vertical bone height of the sinus floor at 6 and 12 months postsurgery was significantly less than that immediately postsurgery. For both groups, augmented bone height of the sinus floor showed significant decrease from 6 months to 24 months postfunctional loading. The mean value of final bone augmentation was 5.85 mm for simultaneous placement and 5.80 mm for delayed placements. Sinus augmentation with simultaneous and delayed placement of implants led to similar survival rates and bone augmentation. Resorption of augmentative bone was evident at 24 months postfunctional loading in both cases. © 2015 by the American College of Prosthodontists.

**Title:** Primary stability and osseointegration of dental implants in polylactide modified bone - A pilot study in Goettingen minipigs

**Citation:** Journal of Cranio-Maxillofacial Surgery, August 2016, vol./is. 44/8(1095-1103)

**Author(s):** Brockmeyer P., Krohn S., Thiemann C., Schulz X., Kauffmann P., Troltzsch M., Schlottig F., Schliephake H., Gruber R.M.

**Abstract:** The present study aimed to evaluate primary stability (PS) and osseointegration of dental implants in polylactide [70/30 poly(L-lactide-co-D, L-lactide); (PLDLA)] modified bone in 30 Goettingen minipigs. Each animal received three implants per jaw quadrant. In a split-mouth design, one side of the maxilla and mandible was randomly allocated to the experimental treatment (PLDLA applied into the drill hole before implantation), while the contralateral sides served as intraindividual controls (no PLDLA applied). The required
insertion torque and the implant stability quotient (ISQ) were measured during implantation. ISQ, volume density (VD) of new bone formation (NBF), and the bone-implant contact (BIC) were evaluated at the end of the observation period (1, 3, 6, 12, and 24 months, respectively) in six animals each. Across all study groups, the PLDLA treatment resulted in a) a comparable insertion torque, b) an equivalent ISQ, c) a reduced BIC, and d) a reduced VD of NBF, as opposed to the untreated controls. In conclusion, the PLDLA treatment did not affect the PS, but rather led to an impaired osseointegration, which was particularly strong in the compact mandibular bone, and decreased in the spongious maxillary bone. PLDLA induced anchoring in spongious bone should be evaluated in further investigations.

Title: Taking stock of training in implant dentistry.

Citation: British dental journal, Aug 2016, vol. 221, no. 4, p. 157-158

Author(s): Barrak, F

Abstract: Despite the ever-growing demand for implant treatments by patients, there is confusion about what the appropriate training pathway in implant dentistry should be. This is accompanied by a worrying lack of training at undergraduate level for correct patient selection and monitoring of implant cases. An unclear training pathway, inappropriate referrals and a 'hands-off' approach to patients with implants may be putting patients at risk. This article highlights these issues with a suggestion that the training should of course follow the current GDC guidelines, but goes further to suggest that the end point of training should be at diploma level as a minimum, either via a university route, or via the RCS Edinburgh Diploma in Implant Dentistry Examination.

Title: Treatment of Labial Soft Tissue Recession Around Dental Implants in the Esthetic Zone Using Guided Bone Regeneration With Mineralized Allograft: A Retrospective Clinical Case Series.

Citation: Journal of oral and maxillofacial surgery : official journal of the American Association of Oral and Maxillofacial Surgeons, Aug 2016, vol. 74, no. 8, p. 1552-1561

Author(s): Le, Bach, Borzabadi-Farahani, Ali, Nielsen, Brady

Abstract: Soft tissue augmentation procedures are often performed to correct gingival recession on the facial aspects of implants in the esthetic zone. This retrospective clinical case series reports on the use of guided bone regeneration (GBR) and a coronal advancement flap with a resorbable membrane and allograft. We analyzed the records of 14 patients (7 men and 7 women) with a mean age of 36.78 years (SD, 13.9 years) who were treated for soft tissue recessions around implant-supported restorations in the maxillary central or lateral incisor location. Implant diameters ranged from 3.3 to 4.7 mm. All patients had bone loss confined to the labial surface of the implant. A solvent-dehydrated particulate mineralized allograft (Puros Cancellous Bone Allograft; Zimmer Biomet Dental, Palm Beach Gardens, FL) and a resorbable membrane (CopiOs Pericardium; Zimmer Biomet Dental) were used in a GBR surgical procedure in combination with a roughened titanium tenting
screw placed 3 to 4 mm below the implant platform to restore unesthetic defects in the anterior maxilla. All postoperative tissue changes from their preoperative states were statistically significant (\(P < .05\), Wilcoxon signed rank test). Mean preoperative crestal bone thickness (measured 2 mm from crest) and mid-implant buccal bone thickness increased by 1.84 mm (SD, 0.89 mm; 95% confidence interval [CI], 1.32 to 2.35 mm) and 2.07 mm (SD, 0.81 mm; 95% CI, 1.60 to 2.53 mm), respectively, approximately 1 year after treatment (\(P < .001\)). Significant mean increases of 1.28 mm (SD, 0.53 mm; 95% CI, 0.97 to 1.58 mm), 1.29 mm (SD, 0.81 mm; 95% CI, 0.82 to 1.75 mm) and 1.23 mm (SD, 0.53 mm; 95% CI, 0.92 to 1.53 mm) also were noted in soft tissue thickness, keratinized tissue width, and gingival height, respectively (\(P < .001\)). Use of the allograft and xenogeneic membrane effectively increased alveolar hard and soft tissue dimensions in the esthetic zone of the anterior maxilla. Future prospective clinical trials with a control group are needed to compare this technique with conventional methods such as connective tissue graft. Copyright © 2016 American Association of Oral and Maxillofacial Surgeons. Published by Elsevier Inc. All rights reserved.

**Title:** Dental Implant Thread Design and the Consequences on Long-Term Marginal Bone Loss.

**Citation:** Implant dentistry, Aug 2016, vol. 25, no. 4, p. 471-477

**Author(s):** Ormianer, Zeev, Matalon, Shlomo, Block, Jonathan, Kohen, Jerry

**Abstract:** The aim of this study was to present the implant macrostructure effect on marginal bone loss using 3 dental implant thread designs with differences in thread pitch, lead, and helix angle. All implants used were sourced from the same company and had the same microstructured surface. This is a nonrandomized, retrospective, double-blind study. Data were collected by an independent Tel Aviv University group from a general practitioner’s private practice patient records. In total, 1361 implants met the inclusion criteria representing the 3 types of implants macrostructure. Overall survival rate was 96.3% with 50 implants failing (3.7%) out of a total of 1361 implants. Survival rates for the 3 groups were: group A 96.6%, group B 95.9%, and in group C 100%. Average bone loss for groups A, B, and C were 2.62 (±1.70) mm, 2.10 (±1.73) mm, and 1.90 (±1.40) mm, respectively. Pairwise comparisons revealed that less bone loss occurred in group A compared with group B (\(P = 0.036\)). Favorable long-term bone loss results were found in implants with a larger pitch, deeper apical threads, and a narrower implant core. One-piece V-thread design implants demonstrated 100% survival rate.

**Title:** The Use of Dental Implants in Organ Transplant Patients Undergoing Immunosuppressive Therapy: An Overview of Publications.

**Citation:** Implant dentistry, Aug 2016, vol. 25, no. 4, p. 541-546

**Author(s):** Radzewski, Rafał, Osmola, Krzysztof

**Abstract:** Immunosuppressive treatment has been commonly considered a contraindication to the use of dental implants. This article is aimed at analyzing the publications related to
that issue and answering the question of whether such treatment is viable in patients with organ transplants. The following databases have been searched to find related publications: Clinical Key, Web of Science, Up to date, PubMed, and Medline. Full research paper texts published over the past 15 years have been taken into consideration. The selected publications were divided depending on the type of study material, that is, whether they focused on animal tests or human tests. The studies performed on animals showed negative impact of immunosuppression on the bones surrounding the implants. Publications presenting clinical cases of organ transplant patients indicated no significant disorders in the process of implant osseointegration despite the use of immunosuppressive drugs. Despite the negative impact of immunosuppressive drugs on the process of bone healing, it is possible to treat organ transplant patients with intraosseous titanium implants. The key to success is the observance of appropriate treatment procedures and proper hygienic routines. An alteration of medication regimen that currently makes use of immunosuppressive drugs of much lower toxicity is also extremely significant.

Title: Factors Influencing Early Dental Implant Failures.

Citation: Journal of dental research, Aug 2016, vol. 95, no. 9, p. 995-1002

Author(s): Chrcanovic, B R, Kisch, J, Albrektsson, T, Wennerberg, A

Abstract: The purpose of the present study was to assess the influence of local and systemic factors on the occurrence of dental implant failures up to the second-stage surgery (abutment connection). This retrospective study is based on 2,670 patients who received 10,096 implants and were consecutively treated with implant-supported prostheses between 1980 and 2014 at 1 specialist clinic. Several anatomic-, patient-, health-, and implant-related factors were collected. Descriptive statistics were used to describe the patients and implants. Univariate and multivariate logistic regression models were used at the patient level as well as the implant level to evaluate the effect of explanatory variables on the failure of implants up to abutment connection. A generalized estimating equation method was used for the implant-level analysis to account for the fact that repeated observations (several implants) were available for a single patient. Overall, 642 implants (6.36%) failed, of which 176 (1.74%) in 139 patients were lost up to second-stage surgery. The distribution of implants in sites of different bone quantities and qualities was quite similar between implants lost up to and after abutment connection. Smoking and the intake of antidepressants were the statistically significant predictors in the multivariate model (ClinicalTrials.gov NCT02369562). © International & American Associations for Dental Research 2016.

Title: Primary stability and osseointegration of dental implants in polylactide modified bone - A pilot study in Goettingen minipigs.

Citation: Journal of cranio-maxillo-facial surgery : official publication of the European Association for Cranio-Maxillo-Facial Surgery, Aug 2016, vol. 44, no. 8, p. 1095-1103
Author(s): Brockmeyer, Phillipp, Krohn, Sebastian, Thiemann, Charlotte, Schulz, Xenia, Kauffmann, Philipp, Tröltzsch, Markus, Schlottig, Falko, Schliephake, Henning, Gruber, Rudolf Matthias

Abstract: The present study aimed to evaluate primary stability (PS) and osseointegration of dental implants in polylactide [70/30 poly(l-lactide-co-d,L-lactide); (PLDLA)] modified bone in 30 Goettingen minipigs. Each animal received three implants per jaw quadrant. In a split-mouth design, one side of the maxilla and mandible was randomly allocated to the experimental treatment (PLDLA applied into the drill hole before implantation), while the contralateral sides served as intraindividual controls (no PLDLA applied). The required insertion torque and the implant stability quotient (ISQ) were measured during implantation. ISQ, volume density (VD) of new bone formation (NBF), and the bone-implant contact (BIC) were evaluated at the end of the observation period (1, 3, 6, 12, and 24 months, respectively) in six animals each. Across all study groups, the PLDLA treatment resulted in a) a comparable insertion torque, b) an equivalent ISQ, c) a reduced BIC, and d) a reduced VD of NBF, as opposed to the untreated controls. In conclusion, the PLDLA treatment did not affect the PS, but rather led to an impaired osseointegration, which was particularly strong in the compact mandibular bone, and decreased in the spongious maxillary bone. PLDLA induced anchoring in spongious bone should be evaluated in further investigations. Copyright © 2016 European Association for Cranio-Maxillo-Facial Surgery. Published by Elsevier Ltd. All rights reserved.
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