Restorative Dentistry

Current Awareness Newsletter

SEPTEMBER 2015
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A basic introduction to the key statistics in medical articles.

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

**August** (12pm)
- Fri 14th Literature Searching
- Tues 18th Understanding articles
- Weds 26th Statistics

**September** (1pm)
- Thurs 3rd Literature Searching
- Fri 11th Understanding articles
- Mon 14th Statistics
- Tues 22nd Literature Searching
- Weds 30th Understanding articles

**October** (12pm)
- Thurs 8th Statistics
- Fri 16th Literature Searching
- Mon 19th Understanding articles
- Tues 27th Statistics

**November** (1pm)
- Weds 4th Literature Searching
- Thurs 12th Understanding articles
- Fri 20th Statistics
- Mon 23rd Literature Searching

**December** (12pm)
- Tues 1st Understanding articles
- Weds 9th Statistics
- Thurs 17th Literature Searching
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On Twitter?

Twitter can be a useful CPD tool. Here are some accounts will help you stay on top of new developments in the Restorative Dentistry field:

- [@BSPerio](https://twitter.com/BSPerio) – the Twitter account for The British Society of Periodontology
- [@BSSPD](https://twitter.com/BSSPD) – the Twitter account for The British Society of Prosthodontics
- [@BESteethforlife](https://twitter.com/BESTeethforlife) – the Twitter account for The British Endodontic Society
Medication-related osteonecrosis of the jaw in patients with cancer
Authors: James R Berenson, MD; Alison T Stopeck, MD

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

Gingivitis and periodontitis in adults: Classification and dental treatment
Authors: Rebecca S Wilder, BSDH, MS; Antonio J Moretti, DDS, MS
Literature review current through: Aug 2015. | This topic last updated: May 06, 2015.

INTRODUCTION — Periodontal, or gum disease is a common condition affecting the tissues that comprise the dental supporting structure: gingiva, cementum, periodontal ligament, and the alveolar bone. Periodontal disease is broadly classified as either gingivitis or periodontitis; these conditions are distinguished by the presence of alveolar bone involvement that occurs with periodontitis, and not with gingivitis.

Periodontal disease may be a risk factor for a number of conditions including cardiovascular and pulmonary diseases, and pregnancies resulting in low birth weight. Clinicians should encourage regular dental visits and incorporate oral examination into their office practice, inspecting for inflamed gingiva, bleeding, or suppuration around teeth.

This topic will review the classification of gingivitis and conditions associated with gingivitis and periodontitis. The pathogenesis, clinical manifestations, and antibiotic treatment of odontogenic infections are discussed in detail separately.

Complications, diagnosis, and treatment of odontogenic infections
Author: Anthony W Chow, MD, FRCPC, FACP

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.
New from the Dental Elf

**Periodontitis and obesity: review suggests an association**

**Sep 14 2015**

Periodontitis and obesity are two of the commonest chronic disorders in the world. An association between obesity and periodontitis was first found in rats in the 1970s and a number of cross-sectional studies have suggested that they may be associated. The aim of this review was to examine the time-dependent association between obesity and periodontitis and how weight changes may affect the development of periodontitis in the general population by assessing longitudinal and experimental studies that assessed the association among overweight, obesity, weight gain, waist circumference, and periodontitis are reviewed.

**Methods**

Searches were conducted in the PubMed/Medline and Web of Knowledge databases. Only cohort studies and intervention studies among children, adolescents, and adults published in English were considered. Two reviewers selected studies with a third review arbitrating disagreements. Study quality and grading of the strength of the evidence (grade I [good/strong] to V [not assignable]) was assessed by two researchers using the Quality Criteria Checklist of the Academy of Nutrition and Dietetics. A narrative summary of the findings was presented.

**Anterior composite restorations had good clinical performance**

**Sep 9 2015**

Although composite resin restorations are increasingly being placed in posterior teeth because of their superior aesthetic appearance, they have been used for the repair and restoration of anterior teeth for decades. The aim of this review was to assess the longevity of anterior composite restorations.

**Methods**

Searches were conducted in the Medline/PubMed, SciVerse Scopus, and Cochrane Central Register of Controlled Trials databases without restriction of date or language. Longitudinal prospective or retrospective clinical trials that evaluated the clinical survival of direct restorations in anterior permanent teeth placed with visible light-cured composite resin were considered. Studies were required to have a minimum follow up of 3 years. Two reviewers independently screened the studies and abstracted data. There was a high degree of heterogeneity amongst the studies regarding study design, methods, and outcomes. Meta-analysis was not conducted but annual failure rates (AFRs) were calculated for each study.
Current Awareness Database Articles on Restorative Dentistry

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

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

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

Peri-implantitis

**Title:** Assessment of periodontal and opportunistic flora in patients with peri-implantitis.

**Citation:** Clinical oral implants research, Aug 2015, vol. 26, no. 8, p. 937-

**Author(s):** Albertini, Matteo, López-Cerero, Lorena, O'Sullivan, Manuel G, Chereguini, Carlos F, Ballesta, Sofia, Ríos, Vicente, Herrero-Climent, Mariano, Bullón, Pedro

**Abstract:** To assess the presence of periodontal and opportunistic organisms in patients with peri-implantitis. Thirty-three partially edentulous subjects (22 women, 11 men), aged 32-90 years, who had one or more implants with peri-implantitis were included. Peri-implantitis was defined as: (i) the presence of bleeding on probing and/or suppuration and (ii) radiographic images showed marginal bone loss >1.8 mm after 1 year in function. Criteria for inclusion were: (i) partially edentulous patients having at least one implant diagnosed with peri-implantitis; (ii) no antibiotic therapy for 6 months prior to clinical examination. Following this definition, a total of 48 implants were diagnosed with peri-implantitis. Subgingival bacterial samples were obtained with sterile paper points from infected implants and selected teeth of each individual. Periodontopathogens (Aggregatibacter actinomycetemcomitans, Porphyromonas gingivalis, Prevotella intermedia, Tannerella forsythia and Treponema denticola) were detected by multiplex PCR targeting 16S rDNA. Samples were placed in reduced transport medium and cultured for opportunistic pathogens (Staphylococcus aureus, enteric bacteria, Pseudomonas and yeasts). Twenty-two patients yielded positive results for P. gingivalis, 25 for T. forsythia, eight for P. intermedia and 13 for T. denticola. None of the patients yielded a positive result for A. actinomycetemcomitans. Non-periodontal species were found in five patients (15% of total). P. aeruginosa was found in four (12%) patients, and C. albicans (3%) and S. aureus in one patient (3%) each. In two cases of peri-implantitis, none of the periodontal or opportunistic
microorganisms studied were detected in either implant or tooth samples. When results of the periodontopathic bacteria from the implant and tooth samples of the same patient were compared, 18 patients (54%) showed the same results for both samples and 15 (45%) patients different results. The implant surface may be colonized with pathogens different from periodontal bacteria. Opportunistic pathogens such as P. aeruginosa, S. aureus and C. albicans may be associated with implant failure.

**Title:** Maintenance therapy in patients following the surgical treatment of peri-implantitis: a 5-year follow-up study.

**Citation:** Clinical oral implants research, Aug 2015, vol. 26, no. 8, p. 950-956 (August 2015)

**Author(s):** Serino, Giovanni, Turri, Alberto, Lang, Niklaus P

**Abstract:** To evaluate the outcomes of conventional periodontal maintenance therapy on patients surgically treated for peri-implantitis. 27 patients with 149 dental implants were monitored during 5 years every 6 months. At each recall visit, the prostheses were removed to have proper access for implant examination and supra- and sub-gingival instrumentation. Sub-gingival instrumentation was performed using an ultrasonic instrument with under 0.12% chlorhexidine irrigation. At baseline (6 months following peri-implant surgery), 149 implants (78 not treated and 71 treated) were available for analysis. Of the 71 treated implants, 43 presented healthy peri-implant condition, while 28 had residual peri-implant pockets either of 4-5 mm or ≥ 6 mm associated with bleeding on probing/suppuration. The longitudinal evaluation revealed that the plaque and the bleeding index scores were low during the entire follow-up period, and healthy peri-implant conditions were maintained for both the 78 non-treated and the 43 treated "healthy" implants. Of the 28 implants with residual pockets, nine showed clinical attachment loss during the 5-year follow-up. Thus, of 71 treated implants, probing attachment loss occurred in only in 9 (13%) of the implants in four patients during the 5-year period. The presence of residual pockets at three or four sites of the implants (circumferential type of pockets) was frequently associated with increased probing pocket depth (PPD) and attachment loss, while this was not the case for implants with the presence of pockets at one or two sites only (site specific). In patients with a high standard of oral hygiene and enrolled in a recall system every 6 months, the peri-implant conditions obtained following peri-implant surgery were maintained stable for the majority of subjects and implants during a 5-year period. Presence of residual pockets around the circumference of the implants seemed to be a high predictor for disease progression.

**Title:** Ligature-induced peri-implantitis in mice.

**Citation:** Journal of periodontal research, Aug 2015, vol. 50, no. 4, p. 519-524 (August 2015)

**Author(s):** Pirih, F Q, Hiyari, S, Barroso, A D V, Jorge, A C A, Perussolo, J, Atti, E, Tetradis, S, Camargo, P M

**Abstract:** Peri-implantitis has a prevalence of 11-47%, involves destruction of peri-implant bone and may lead to implant loss. A detailed understanding of the pathogenesis of peri-implantitis is lacking. The objective of this study was to develop a murine model of experimental peri-implantitis. Machined, smooth-surface, screw-shaped titanium implants
were placed in the healed alveolar bone of the left maxillary molars of C57BL/6J male mice, 8 wk after tooth extraction. Peri-implantitis was induced by securing silk ligatures around the head of the implant fixtures. Implant survival and peri-implant bone levels were analyzed by micro-computed tomography (micro-CT) scans and histology, 12 wk after ligature placement. Implant survival was 60% (six of 10) for implants with ligatures and 100% (eight of eight) for controls. Micro-CT revealed significantly greater bone loss around the implants that received ligatures and that survived, compared with controls. The radiographic findings were confirmed via histology and toluidine blue staining. This study describes a murine model of experimental peri-implantitis around screw-shaped titanium implants placed in the edentulous alveolar bone. This model should be a useful tool to dissect pathogenic mechanisms of peri-implantitis and evaluate potential treatment interventions.

Title: Medium- and Long-Term Complications in Full-Arch Rehabilitions Supported by Upright and Tilted Implants.

Citation: Clinical implant dentistry and related research, Aug 2015, vol. 17, no. 4, p. 758-764

Author(s): Francetti, Luca, Corbella, Stefano, Taschieri, Silvio, Cavalli, Nicolò, Del Fabbro, Massimo

Abstract: The purpose of this retrospective investigation was to present the incidence of biological and technical complications in patients treated with implant-supported, immediately loaded full-arch restorations. Clinical data of all patients treated with full-arch, immediately loaded rehabilitations supported by a combination of upright and tilted implants were screened. Data on both technical and biological complications (such as peri-implant mucositis and peri-implantitis) and their onset and frequency of occurrence were recorded and analyzed. The clinical records of 86 patients (95 prosthetic rehabilitations) were included in this study. There were 61 mandibular rehabilitations and 34 maxillary ones, all of them immediately loaded within 8 to 48 hours of the surgical intervention. The follow-up time varied from 16.3 to 112 months of function (mean 65.36 months). The most common biological complications were hygiene-related (n = 81; 30.2% of patients displayed peri-implant mucositis and 10.4% peri-implantitis). Among all prosthetic complications, the detachment of an element of the definitive prosthesis was the most frequent event (n = 20; 23.2% of patients). The total number of prosthetic complications was 42. Most complications were reversible and did not affect the overall implant/prosthesis survival rate. The occurrence in well-maintained patients of technical and biological complications in full-arch rehabilitations supported by a combination of tilted and upright implants in the medium to long term is lower than previously reported by the pertinent literature. Further studies are needed to confirm this result.

Bisphosphonate-related osteonecrosis of the jaw

Title: Bisphosphonate-induced differential modulation of immune cell function in gingiva and bone marrow in vivo: Role in osteoclast-mediated NK cell activation.

Citation: Oncotarget, Aug 2015, vol. 6, no. 24, p. 20002-20025 (August 21, 2015)
**Author(s):** Tseng, Han-Ching, Kanayama, Keiichi, Kaur, Kawaljit, Park, So-Hyun, Park, Sil, Kozlowska, Anna, Sun, Shutong, McKenna, Charles E, Nishimura, Ichiro, Jewett, Anahid

**Abstract:** The aim of this study is to establish osteoclasts as key immune effectors capable of activating the function of Natural Killer (NK) cells, and expanding their numbers, and to determine in vivo and in vitro effect of bisphosphonates (BPs) during NK cell interaction with osteoclasts and on systemic and local immune function. The profiles of 27 cytokines, chemokines and growth factors released from osteoclasts were found to be different from dendritic cells and M1 macrophages but resembling to untreated monocytes and M2 macrophages. Nitrogen-containing BPs Zoledronate (ZOL) and Alendronate (ALN), but not non-nitrogen-containing BPs Etidronate (ETI), triggered increased release of pro-inflammatory mediators from osteoclasts while all three BPs decreased pit formation by osteoclasts. ZOL and ALN mediated significant release of IL-6, TNF-α and IL-1β, whereas they inhibited IL-10 secretion by osteoclasts. Treatment of osteoclasts with ZOL inhibited NK cell mediated cytotoxicity whereas it induced significant secretion of cytokines and chemokines. NK cells lysed osteoclasts much more than their precursor cells monocytes, and this correlated with the decreased expression of MHC class I expression on osteoclasts. Intravenous injection of ZOL in mice induced pro-inflammatory microenvironment in bone marrow and demonstrated significant immune activation. By contrast, tooth extraction wound of gingival tissues exhibited profound immune suppressive microenvironment associated with dysregulated wound healing to the effect of ZOL which could potentially be responsible for the pathogenesis of Osteonecrosis of the Jaw (ONJ). Finally, based on the data obtained in this paper we demonstrate that osteoclasts can be used as targets for the expansion of NK cells with superior function for immunotherapy of cancer.

**Title:** Survey on awareness and perceptions of bisphosphonate-related osteonecrosis of the jaw in dental hygienists in Seoul.

**Citation:** International journal of dental hygiene, Aug 2015, vol. 13, no. 3, p. 222-227

**Author(s):** Mah, Y-J, Kang, G-Y, Kim, S-J

**Abstract:** We investigated awareness in dental hygienists of bisphosphonate-related osteonecrosis of the jaw (BRONJ) in patients with osteoporosis and cancer and assessed the situation in systemic history investigations to broaden the scope of the dental hygienists’ BRONJ awareness as a basis for contributing to preventing this disease. The study was carried out through a survey; 217 dental hygienists responded to the survey. They worked at 12 university and general hospitals, 10 dental hospitals and 35 dental clinics, for a total of 57 institutions in Seoul. The survey consisted of 37 questions: general characteristics (J Oral Maxillofac Surg 65: 2007; 369), systemic history investigations (Ruggiero et al. J Oral Maxillofac Surg 62: 2004; 527) and awareness of BRONJ (Park et al. J Korean Dent Assoc 49: 2011; 389). Among them, 79.7% were aware of BRONJ. Recognition was highest among those from 25 to 35 years old (P < 0.05). In terms of work experience, those with 5-10 years experience showed the highest awareness (P < 0.05). In terms of institutions type, dental clinics showed lower awareness than general and dental hospitals (P < 0.05). It was found that 55.3% of the dental hygienists had been educated about BRONJ. Those aged 25-35 years were the most educated. In terms of institutions, dental clinic staff were the least
educated. The degree of understanding about BRONJ was analysed with the average score of 6.14 points. According to these results, dental hygienists working in university hospitals and general hospitals had more opportunity to receive training than those working in dental clinics. Thus, it is considered that the development of professional training programs about BRONJ for all dental hygienists is necessary.

Title: [Effect of thalidomide on development of bisphosphonate-related osteonecrosis of the jaws in rats].

Citation: Nan fang yi ke da xue xue bao = Journal of Southern Medical University, Aug 2015, vol. 35, no. 8, p. 1084-1089, 1673-4254 (August 2015)

Author(s): Song, Zhiqiang, Dong, Wei, Yin, Lujia, Liu, Juanjuan, Sun, Hong, Qi, Mengchun

Abstract: To investigate the effect of thalidomide on the development of bisphosphonate-related osteonecrosis of the jaws (BRONJ). Thirty-six rats were randomly divided into groups A, B and C, and treated with saline, zoledronate and zoledronate plus thalidomide, respectively. Three weeks later, the left maxillary first molars of the rats were extracted. Four and eight weeks after tooth extraction, samples were harvested for evaluation of osteonecrosis of the jaws, microvessel density, and cell apoptosis. At both of the time points, no exposed dead bone was observed at the extraction socket areas in the rats except for some small fistulas in groups B and C. Histological examination confirmed the absence of dead bone in group A, whereas small areas of dead bone were observed around the extraction socket in groups B and C. Compared with those in group A, the percentage of empty lacunae and the area of dead bone were significantly increased (P<0.01), whereas bone lacunae density was significantly decreased (P<0.01) in groups B and C at both time points. Microvessel density in groups B and C were also significantly decreased (P<0.01) by 25.87% and 55.27% at week 4, and by 45.62% and 72.84% at week 8, respectively; the apoptotic cells in groups B and C increased by 54.80% and 87.89% at week 4 (P<0.01), and by 208.08% and 250.58% at week 8 (P<0.01), respectively. Thalidomide can aggravate zoledronate-induced early-stage BRONJ, and their osteonecrosis-inducing effect of the jaw may be attributed, at least partly, to the inhibition of angiogenesis.

Cleft lip and palate

Title: Displacements prediction from 3D finite element model of maxillary protraction with and without rapid maxillary expansion in a patient with unilateral cleft palate and alveolus

Citation: BioMedical Engineering Online, August 2015, vol./is. 14/1, 1475-925X (August 19, 2015)

Author(s): Zhang D., Zheng L., Wang Q., Lu L., Ma J.

Language: English

Abstract: Background: Both maxillary protraction and rapid expansion are recommended for patients with cleft palate and alveolus. The aim of the study is to establish a three-dimensional finite element model of the craniomaxillary complex with unilateral cleft palate
and alveolus to simulate maxillary protraction with and without rapid maxillary expansion. The study also investigates the deformation of the craniomaxillary complex after applied orthopaedic forces in different directions. Methods: A three dimensional finite element model of 1,277,568 hexahedral elements (C3D8) and 1,801,945 nodes was established based upon CT scan of a patient with unilateral cleft palate and alveolus on the right side in this study. A force of 4.9N per side was directed on the anatomic height of contour on the buccal side of the first molar. The angles between the force vector and occlusal plane were -30degree, -20degree, -10degree, 0degree, 10degree, 20degree, and 30degree. A force of 2.45N on each loading point was directed on the anatomic height of contour on the lingual side of the first premolar and the first molar to simulate the expansion of the palate.

Results: The craniomaxillary complex displaced forward under any of the loading conditions. The sagittal and vertical displacement of the craniomaxillary complex reached their peak at the protraction degree of -10degree forward and downward to the occlusal plane. There were larger sagittal displacements when the maxilla was protracted forward with maxillary expansion. The palatal plane rotated counterclockwise under any of the loading conditions. Being protracted without expansion, the dental arch was constricted. When supplemented with maxillary expansion, the width of the dental arch increased. Transverse deformation of the dental arch on affected side was different from that on unaffected side. Conclusions: Protraction force alone led the craniomaxillary complex moved forward and counterclockwise, accompanied with lateral constrain on the dental arch. Additional rapid maxillary expansion resulted in a more positive reaction including both larger sagittal displacement and the width of the dental arch increase.

Title: Using the avian mutant talpid as a disease model for understanding the oral-facial phenotypes of oral-facial-digital syndrome

Citation: DMM Disease Models and Mechanisms, August 2015, vol./is. 8/8(855-866), 1754-8403;1754-8411

Author(s): Schock E.N., Chang C.-F., Struve J.N., Chang Y.-T., Chang J., Delany M.E., Brugmann S.A.

Abstract: Oral-facial-digital syndrome (OFD) is a ciliopathy that is characterized by oralfacial abnormalities, including cleft lip and/or palate, broad nasal root, dental anomalies, micrognathia and glossal defects. In addition, these individuals have several other characteristic abnormalities that are typical of a ciliopathy, including polysyndactyly, polycystic kidneys and hypoplasia of the cerebellum. Recently, a subset of OFD cases in humans has been linked to mutations in the centriolar protein C2 Ca<sup>2+</sup>-dependent domain-containing 3 (C2CD3). Our previous work identifiedmutations inC2CD3 as the causal genetic lesion for the avian talpid<sup>2</sup> mutant. Based on this common genetic etiology, we re-examined the talpid<sup>2</sup> mutant biochemically and phenotypically for characteristics of OFD. We found that, as in OFD-affected individuals, protein-protein interactions between C2CD3 and oral-facial-digital syndrome 1 protein (OFD1) are reduced in talpid<sup>2</sup> cells. Furthermore, we found that all common phenotypes were conserved between OFD-affected individuals and avian talpid<sup>2</sup> mutants. In light of these findings, we utilized the talpid<sup>2</sup> model to examine the cellular basis for the oralfacial phenotypes present in OFD. Specifically, we examined the development and differentiation of cranial neural crest cells.
(CNCCs) when C2CD3-dependent ciliogenesis was impaired. Our studies suggest that although disruptions of C2CD3-dependent ciliogenesis do not affect CNCC specification or proliferation, CNCC migration and differentiation are disrupted. Loss of C2CD3-dependent ciliogenesis affects the dispersion and directional persistence of migratory CNCCs. Furthermore, loss of C2CD3-dependent ciliogenesis results in dysmorphic and enlarged CNCC-derived facial cartilages. Thus, these findings suggest that aberrant CNCC migration and differentiation could contribute to the pathology of oral-facial defects in OFD.

Title: Burden of oral diseases in Iran, 1990-2010: Findings from the global burden of disease study 2010

Citation: Archives of Iranian Medicine, August 2015, vol./is. 18/8(486-492), 1029-2977;1735-3947

Author(s): Shoae S., Ghasemian A., Mehrabani K., Naderimagham S., Delavari F., Sheidaei A., Hajizadeh N., Varmaghani M., Hessari H.

Abstract: Background: Oral diseases, as a group of chronic diseases, are among the major public health problems that lead to disability throughout the world. The major part of burden of oral diseases is caused by dental caries, periodontal diseases, edentulism, mouth cancer, cleft lip, and cleft palate. The aim of the present paper is to report the global results for the burden of oral disease in Iran from 1990 to 2010, derived from the Global Burden of Disease study 2010 (the GBD study 2010) by sex and age. Methods: The Global Burden of Disease Study 2010 was a systematic effort with a common framework to estimate disability adjusted life years (DALYs) for diseases in different parts of the world. Years of life lost due to premature mortality (YLLs) were assessed based on cause-of-death estimates and by means of a cause of death ensemble model (CODEm). Years of life lost due to disability (YLDs) were computed by multiplying the prevalence, the disability weight for a sequel, and the duration of symptoms. A systematic review of published and unpublished data was conducted to estimate disease distribution using a Bayesian meta-regression method (DisMod-MR). Disability weights were measured by collecting data from population-based surveys. Uncertainty interval (UI) from all inputs into the calculations of DALYs was disseminated using Monte Carlo simulation techniques. In this paper, we describe the results of the GBD study 2010 regarding oral diseases in Iran, critique the results, and provide some recommendations. Results: Between 1990 and 2010 in Iran, an increase occurred in DALYs at all ages, attributed to dental caries (from 37,230 to 56,521) as well as periodontal diseases (from 21,482 to 43,308), and a decrease was found for edentulism (from 53,134 to 47,960). DALYs at all ages attributed to mouth cancer increased (from 5,597 to 7,771), while a decline was noted for cleft lip and cleft palate (from 6,157 to 5,034). The age-standardized DALY rates per 100,000 population did not considerably change for dental caries and periodontal diseases, while edentulism showed a reduction. The corresponding DALY rate due to mouth cancer decreased, while it remained almost unchanged for cleft lip and cleft palate over this period. DALY rates per 100,000 population due to dental canes and edentulism were higher among Iranian women than for Iranian men at all ages, while Iranian men suffered from a higher burden of periodontal disease, mouth cancer, cleft lip, and cleft palate. The most significant burden due to dental caries and periodontal diseases was found in Iranians aged 15-49 and 50-69 years, respectively and edentulism and mouth cancer led to the highest burden in Iranians older than 70 years of age. The highest burden
caused by cleft lip and cleft palate occurred in children younger than 5 years old.

Conclusion: The findings address the challenging changes in oral diseases and difficulties in responding to the urgent oral health needs in Iran. The burden of oral diseases should be considered as a priority in Iran. A need also exists to pay more attention to the oral health policies and principles of preventive oral care. Global analyses of disease burdens provide a useful framework to guide a suitable policy in response to disease changes. In fact, strong national and sub-national analyses will be required to provide more effective public health strategies.

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**Periodontal disease and antibiotics**

**Title:** Nonsurgical periodontal therapy to treat a case of severe periodontitis: A 12-year follow-up.

**Citation:** Journal of the American Dental Association (1939), Aug 2015, vol. 146, no. 8, p. 631-637 (August 2015)

**Author(s):** Carnio, João, Moreira, Ana Karina, Jenny, Todd, Camargo, Paulo M, Pirih, Flavia Q

**Abstract:** This case report describes the successful treatment of a severe chronic periodontitis case by nonsurgical therapy and a strict maintenance program over a 12-year period. A 38-year-old man concerned about the protrusion of his maxillary incisors was referred for periodontal treatment. The teeth in the maxillary arch had generalized severe chronic periodontitis. Several treatment options were presented to the patient including the most aggressive, extraction of all maxillary teeth, and the most conservative, scaling and root planing. The patient opted to having the most conservative approach, even though the prognoses for the maxillary teeth were unfavorable. Therefore, he received nonsurgical therapy via scaling and root planing combined with systemic antibiotics before referral to an orthodontist to address the esthetic concerns. The maxillary dentition was treated with orthodontic therapy to retract and align the maxillary anterior segment. Periodontal maintenance (1-hour session), including subgingival instrumentation, was performed 4 times per year until the end of the 12-year follow-up period. The patient only missed 2 appointments in 12 years. Twelve years later, the results revealed that all but 1 maxillary tooth were maintained in a state of acceptable health, function, and esthetics. Although most would agree with the initial poor prognosis of this patient’s case, nonsurgical periodontal therapy was utilized with a 3-month periodontal maintenance program and demonstrated long-term success. The outcome presented in this case report may only have been possible because of patient compliance, professional experience, skill, and supervision throughout the course of treatment. Copyright © 2015 American Dental Association. Published by Elsevier Inc. All rights reserved.

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**Title:** Combined orthodontic and periodontic treatment in a child with Papillon Lefèvre syndrome.

**Citation:** Saudi medical journal, Aug 2015, vol. 36, no. 8, p. 987-992, 0379-5284

**Author(s):** AlSarheed, Maha A, Al-Sehaibany, Fares
**Abstract:** A 9-year-old girl with Papillon-Lefèvre syndrome (PLS) was treated orthodontically 24 months after the start of mechanical and antibiotic therapy in adjunct with periodontal treatment every 6 weeks. After achieving stable periodontal conditions, orthodontic treatment was commenced to correct the teeth position, facial profile, and maxillary protraction. Following the combination therapy and a failure to detect Actinobacillus actinomycetemcomitans from any site in the oral cavity, orthodontic treatment with a fixed appliance was performed aside from creating space for eruption of permanent teeth. We found that combined periodontal and orthodontic treatment of PLS may be successful with a complex interdisciplinary regimen and close follow up. This is a 2-year follow-up case report of a girl with PLS. Orthodontic and periodontic therapy were offered using combined treatments of orthodontic and periodontal with the benefit of prosthodontic consultation, resulting in a treatment plan.

**Title:** Association between immunologic parameters, glycemic control, and postextraction complications in patients with type 2 diabetes.

**Citation:** Journal of the American Dental Association (1939), Aug 2015, vol. 146, no. 8, p. 592-599 (August 2015)

**Author(s):** Fernandes, Karin Sá, Glick, Michael, de Souza, Mario Sérgio, Kokron, Cristina Maria, Gallottini, Marina

**Abstract:** The purpose of this study was to assess the association between metabolic control and immune dysfunction, and postoperative complications and wound healing after dental extractions in people with type 2 diabetes and control participants. The authors performed a prospective, case-control study enrolling 53 participants with type 2 diabetes and 29 participants who did not have type 2 diabetes. Exclusion criteria included being a smoker and having teeth with periodontal pockets deeper than 4 millimeters, among others. All participants underwent an extraction of 1 erupted tooth. The investigators assessed patients’ signs and symptoms at 3, 7, 21, and 60 days after surgery. The investigators measured glycemic control and immunologic profile at the time of the extraction. They compared the pattern of healing and the incidence of postextraction complications between the 2 groups. Even in the presence of impaired neutrophil function and poor glycemic control, we found no increase in the number of postoperative complications. There was no association between delayed wound epithelialization on postoperative day 21 and level of glycemic control, and reduced neutrophil function. On postoperative day 60, all alveolar sockets were epithelialized completely and showed no signs of infection. The study results suggest that type 2 diabetes per se or glycemic control is not a risk factor for experiencing postoperative complications in people undergoing dental extractions. Although people with type 2 diabetes may have impaired neutrophil function, the study results revealed that having this condition was not associated with an increased risk of experiencing postoperative complications. Additional research studies with larger sample sizes of patients who have diabetes are needed to confirm this study's findings. The results allow clinicians to infer that people with type 2 diabetes undergoing dental extractions of erupted teeth that do not have an acute odontogenic infection should not receive antibiotic prophylaxis simply because of their diabetic status or level of glycemic control. Copyright © 2015 American Dental Association. Published by Elsevier Inc. All rights reserved.
Title: Assessment of periodontal and opportunistic flora in patients with peri-implantitis.

Citation: Clinical oral implants research, Aug 2015, vol. 26, no. 8, p. 937-941 (August 2015)

Author(s): Albertini, Matteo, López-Cerero, Lorena, O’Sullivan, Manuel G, Chereguini, Carlos F, Ballesta, Sofia, Ríos, Vicente, Herrero-Climent, Mariano, Bullón, Pedro

Abstract: To assess the presence of periodontal and opportunistic organisms in patients with peri-implantitis. Thirty-three partially edentulous subjects (22 women, 11 men), aged 32-90 years, who had one or more implants with peri-implantitis were included. Peri-implantitis was defined as: (i) the presence of bleeding on probing and/or suppuration and (ii) radiographic images showed marginal bone loss >1.8 mm after 1 year in function. Criteria for inclusion were: (i) partially edentulous patients having at least one implant diagnosed with peri-implantitis; (ii) no antibiotic therapy for 6 months prior to clinical examination. Following this definition, a total of 48 implants were diagnosed with peri-implantitis. Subgingival bacterial samples were obtained with sterile paper points from infected implants and selected teeth of each individual. Periodontopathogens (Aggregatibacter actinomycetemcomitans, Porphyromonas gingivalis, Prevotella intermedia, Tannerella forsythia and Treponema denticola) were detected by multiplex PCR targeting 16S rDNA. Samples were placed in reduced transport medium and cultured for opportunistic pathogens (Staphylococcus aureus, enteric bacteria, Pseudomonas and yeasts). Twenty-two patients yielded positive results for P. gingivalis, 25 for T. forsythia, eight for P. intermedia and 13 for T. denticola. None of the patients yielded a positive result for A. actinomycetemcomitans. Non-periodontal species were found in five patients (15% of total). P. aeruginosa was found in four (12%) patients, and C. albicans (3%) and S. aureus in one patient (3%) each. In two cases of peri-implantitis, none of the periodontal or opportunistic microorganisms studied were detected in either implant or tooth samples. When results of the periodontopathic bacteria from the implant and tooth samples of the same patient were compared, 18 patients (54%) showed the same results for both samples and 15 (45%) patients different results. The implant surface may be colonized with pathogens different from periodontal bacteria. Opportunistic pathogens such as P. aeruginosa, S. aureus and C. albicans may be associated with implant failure. © 2014 John Wiley & Sons A/S. Published by John Wiley & Sons Ltd.

Head and neck oncology and dentistry

Title: cGVHD-Related Caries and Its Shared Features with Other 'Dry-Mouth'-Related Caries.

Citation: Brazilian dental journal, Aug 2015, vol. 26, no. 4, p. 435-440 (August 2015)

Author(s): Santos-Silva, Alan Roger, Feio, Patricia do Socorro Queiroz, Vargas, Pablo Agustin, Correa, Maria Elvira Pizzigatti, Lopes, Marcio Ajudarte

Abstract: Several systemic diseases and their medical treatment may predispose the development of aggressive dental caries. Head and neck radiotherapy, chemotherapy, Sjögren's syndrome and long-standing treatment with drugs that induce hyposalivation are some of these conditions. The aim of this article is to describe the clinical features of five patients who developed chronic graft-versus-host-disease (cGVHD) as a complication of
allogeneic hematopoietic stem cell transplantation (allo-HSCT) and, in spite of close dental follow-up, subsequently developed rampant caries. In these cases, the restorations showed early failure and the caries still progressed until generalized teeth destruction. The majority of the teeth therefore had to be extracted due to advanced dental caries and rapid clinical progression. Herein the term "cGVHD-related caries" is proposed to describe this under-recognized complication of cancer treatment that may evolve in allo-HSCT recipients that develop cGVHD. This condition is poorly recognized in the literature and may represent the final result of the clustering of oral complications in cGVHD patients, including mucositis, oral pain, hyposalivation, taste loss and oral infections, leading to rampant caries due to impaired oral hygiene and increased intake of highly cariogenic food. Consequently, the knowledge of this oral complication should improve the medical and dental management of cGVHD oral manifestations and improve the quality of life of patients with this post allo-HSCT complication.

Title: Knowledge, Perceived Ability and Practice Behaviors Regarding Oral Health among Pediatric Hematology and Oncology Nurses.

Citation: Journal of dental hygiene : JDH / American Dental Hygienists' Association, Aug 2015, vol. 89, no. 4, p. 219-228

Author(s): Perry, Antiana D, Iida, Hiroko, Patton, Lauren L, Wilder, Rebecca S

Abstract: Oral complications are common in children undergoing head and neck radiation and chemotherapy. The purpose of this study is to examine the knowledge, perceived ability and practice behaviors of pediatric oncology and hematology nurses in assisting with the various oral health care needs of pediatric oncology patients and to identify pediatric oncology nurses' previous training/education, practice types and other demographic characteristics that are related to their oral health competencies. A survey of a convenience sample of Pediatric Oncology and Hematology Nurses was conducted during the Association of Pediatric Oncology and Hematology Nurses' (APHON) 36(th) Annual Conference and Exhibit. Descriptive analysis and the exploratory factor analyses were performed using SAS version 9.2 (SAS Institute, Inc., Cary, NC). Among the 300 surveys that were distributed, 235 surveys were completed (78% response rate) by pediatric oncology or hematology nurses who provide direct patient care in the U.S. Approximately 75% reported receiving less than 3 hours of oral health related education/training. Bivariate analyses indicated that nurses who had clinical requirements regarding oral health assessment during nursing education/training presented greater overall oral health competencies including having greater confidence in examining oral complications than those who did not. Pediatric oncology nurses' knowledge, perceived ability and practice in assisting patient's oral hygiene care, preventing and managing oral complications vary by topic and might reflect their educational preparedness. This study may provide valuable information pertaining to the need and opportunity for interprofessional oral health care education and collaboration with nursing and dental professionals, in order to increase access to comprehensive oral care for pediatric cancer patients. Copyright © 2015 The American Dental Hygienists’ Association.
**Title:** Coping with an altered mouth and perceived supportive care needs following head and neck cancer treatment.

**Citation:** Supportive care in cancer : official journal of the Multinational Association of Supportive Care in Cancer, Aug 2015, vol. 23, no. 8, p. 2365-2373 (August 2015)

**Author(s):** Pateman, K A, Ford, P J, Batstone, M D, Farah, C S

**Abstract:** Oral health is essential to general health and well-being and is severely impacted by head and neck cancer (HNC) and its treatment. This study aimed to describe how people who have been treated for HNC cope with altered oral health and function and to identify their supportive care needs. A qualitative, descriptive approach was used. Data was collected from individual interviews with six participants 6 months after treatment. Data analysis was performed by qualitative content analysis involving inductive and directed approaches. Directed content analysis was guided by the Stress, Appraisal and Coping Model. Three themes describing changed oral health were identified from the data: dimensions of eating, maintaining oral health after treatment and adapting to the chronic side effects of treatment. A strong use of problem-focused coping was described, in addition to the importance of peer support in adapting to the psychosocial outcomes of treatment. Support needs identified related to increased access to specialist dental oncology services post treatment, information needs and a need for more psychological support. The study findings describe the experience of a sample of people who have received treatment for HNC. Due to a demographically homogenous sample and the strong use of positive coping strategies, the results presented may not describe the experience of the wider HNC population; however, these results provide insight into factors that may influence positive coping.

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**Dental implants**

**Title:** Rehabilitation With Implants After Bone Lid Surgery in the Posterior Mandible.

**Citation:** Journal of Oral & Maxillofacial Surgery (02782391), 01 August 2015, vol./is. 73/8(1485-1492), 02782391

**Author(s):** Sivolella, Stefano, Brunello, Giulia, Berengo, Mario, De Biagi, Marleen, Bacci, Christian

**Abstract:** Bone defects are often secondary to alveolar disease removal. Creating a bone lid with piezosurgery is a valid method to preserve the alveolar bone. A careful and precise osteotomy associated with a firm placement of the bone lid in its original position enables better bone healing, thus allowing for the delayed insertion of dental implants at the operated site with no need for any bone augmentation procedures. The aim of this technical note is to present the application of the bone lid surgery in the posterior mandible before dental implant rehabilitation.
**Title:** Immediate loading short implants inserted on low bone quantity for the rehabilitation of the edentulous maxilla using an All-on-4 design.

**Citation:** Journal of Oral Rehabilitation, 01 August 2015, vol./is. 42/8(615-623), 0305182X

**Author(s):** Maló, P., Araújo Nobre, M. A., Lopes, A. V., Rodrigues, R.

**Abstract:** More studies evaluating the outcome of short-length dental implants in immediate loading are needed. To evaluate the use of short-length tapered implants in immediate loading for complete edentulous maxillae rehabilitations using an All-on-4 design. This retrospective clinical study included a cohort of 43 patients with 172 implants (74 short-length implants) inserted in low bone quantity. The patients were followed between 4 months and 6 years (average = 3 years). Outcome measures were implant survival, marginal bone remodelling, biological and mechanical complications. Two patients with four short-length implants were lost to follow-up during the first year. Three short and three long implants failed in four patients, rendering an overall cumulative survival rate implant and patient level, respectively, of 95·7% and 95·1% for short implants, 100% for regular implants and 96·6% and 95·2% for long implants. The average marginal bone remodelling at 1 and 3 years was 0·97 and 1·25 mm for the short implants, 0·82 and 0·87 mm for regular implants and 0·87 and 0·98 mm for long implants. Three patients presented 4 short-length implants with peri-implant pockets (3 implants in 2 patients were pseudo-pockets). Mechanical complications were registered in 13 patients (7 provisional prostheses fractures and 6 abutment screw loosening). All complications were treated successfully. Within the limitations of this clinical study, the short-term outcome of fixed prosthetic complete edentulous maxillae rehabilitations supported by short-length implants inserted in low bone quantity areas is viable. Long-term clinical studies are necessary for evaluating the outcome of these implants.

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**Title:** Using the “final-on-four” concept to deliver an immediate metal-resin implant-fixed complete dental prosthesis.

**Citation:** Journal of Prosthetic Dentistry, 01 August 2015, vol./is. 114/2(161-166), 00223913

**Author(s):** Yilmaz, Burak, Ozcelik, Tuncer Burak, McGlumphy, Edwin

**Abstract:** In traditional dental implant therapy, the time between implant placement and delivery of the definitive prosthesis can be long and uncomfortable for a patient wearing a conventional removable denture on an atrophied ridge. New clinical protocols, often with tilted implants, are being used to immediately restore mandibular implants with interim restorations, thus shortening the patient’s return to function. However, these conversion type interim restorations do not decrease the time to definitive prosthetic rehabilitation. The Ohio State University (OSU) developed an immediate load surgical and prosthetic protocol to compensate for the disadvantages of previous techniques. With this protocol, a custom, definitive, screw-retained metal-resin fixed prosthesis can be delivered 2 to 4 days postoperatively and has been described using 5 implants. This clinical report presents the OSU immediate loading protocol, combined with a tilted implant technique, for the fabrication of a mandibular metal-resin implant fixed complete dental prosthesis (MRIFCDP) in 3 days postoperatively and with only 4 implants. Replacing the mandibular dentition with an immediate load-fixed metal-resin prosthesis by means of the “final-on-four” technique
resulted in a custom, definitive, and functional restorative solution immediately after surgery.

**Title:** Digital design of a surgical guide for placement of definitive implants before orthodontic treatment.

**Citation:** Journal of Prosthetic Dentistry, 01 August 2015, vol./is. 114/2(174-177), 00223913

**Author(s):** Bayraktaroglu, Hanife Canan, Kim, Jae Seon, Londono, Jimmy, Baker, Philip S.

**Abstract:** Interdisciplinary treatment planning is an essential part of orthodontic therapy for patients with partial edentulism, especially when dental implants are to serve initially as anchorage and ultimately as prosthetic abutments for the definitive fixed restoration. A technique is presented for designing and fabricating a computed tomography-based surgical guide to place definitive implants before orthodontic therapy. First, the diagnostic cast and the orthodontic tooth arrangement and diagnostic waxing cast are scanned with a 3-dimensional optical scanner. Three-dimensional renderings of these scans are then merged and superimposed onto the cone beam computed tomography (CBCT) image with implant planning software to develop definitive implant positions. A custom surgical guide is fabricated from these data.

**Title:** Effects of different rhBMP-2 release profiles in defect areas around dental implants on bone regeneration.

**Citation:** Biomedical materials (Bristol, England), Aug 2015, vol. 10, no. 4, p. 045007.

**Author(s):** Jo, Jae Ho, Choi, Sung Wook, Choi, Jae Won, Paik, Dong Hyun, Kang, Seong Soo, Kim, Se Eun, Jeon, Yong-Chan, Huh, Jung Bo

**Abstract:** This study was undertaken to evaluate the effects of different rhBMP-2 release profiles in defect areas around dental implants on osseointegration and bone regeneration. Four beagle dogs (13-15 kg) were used. The defect was 3 mm deep and there was a 1 mm gap around the implant. Each of the four implants was installed on the right and left mandibular alveolar ridges. After the implants were placed, experimental groups were applied to the surrounding defect area (n = 8 in each group, the control group was not treated). The inject group was injected with rhBMP-2 solution directly. In the gel group, rhBMP-2 mixed with a hydrogel matrix was applied. In the particle-gel group, rhBMP-2-embedded poly(lactic-co-glycolic acid)(PLGA) microparticles mixed with hydrogel matrix were applied to maintain consistent release. Sequential fluorescent labeling and histological analysis were performed to evaluate the new bone formation and osseointegration in the defect area. In the control group, larger marginal bone loss was detected as compared with the other groups (P < 0.05). The gel group showed significantly higher levels of BIC in the buccal and lingual defect areas compared with the other groups (P < 0.05). New-bone percentages in the inject and gel groups formed more new bone than in the particle-gel and control groups (P < 0.05). Despite the limitations of this study, the use of only hydrogel, which allows early release of rhBMP-2 followed by consistent extended release, showed better bone formation and osseointegration than simple injection or PLGA microparticles with hydrogel matrix.
Title: Long-term Short Implants Performance: Systematic Review and Meta-Analysis of the Essential Assessment Parameters.

Citation: Brazilian dental journal, Aug 2015, vol. 26, no. 4, p. 325-336 (August 2015)

Author(s): Gonçalves, Thais Marques Simek Vega, Bortolini, Sergio, Martinolli, Matteo, Alfenas, Bruna Fernandes Moreira, Peruzzo, Daiane Cristina, Natali, Alfredo, Berzaghi, Andrea, Garcia, Renata Cunha Matheus Rodrigues

Abstract: Lack of standard criteria in the outcome assessment makes it difficult to draw conclusions on the clinical performance of short implants and, under these circumstances, determine the reasons for implant failure. This study evaluated, through a systematic review of the literature and meta-analysis, the essential parameters required to assess the long-term clinical performance of short and extra-short implants. Electronic databases (Pubmed-MEDLINE, Cochrane Library Database, Embase, and Lilacs) were searched by two independent reviewers, without language limitation, to identify eligible papers. References from the selected articles were also reviewed. The review included clinical trials involving short dental implants placed in humans, published between January 2000 and March 2014, which described the parameters applied for outcome’s measurements and provided data on survival rates. Thirteen methodologically acceptable studies were selected and 24 parameters were identified. The most frequent parameters assessed were the marginal bone loss and the cumulative implant survival rate, followed by implant failure rate and biological complications such as bleeding on probing and probing pocket depths. Only cumulative implant survival rate data allows meta-analysis revealing a positive effect size (from 0.052 (fixed) to 0.042 (random)), which means that short implant appears to be a successful treatment option. Mechanical complications and crown-to-implant (C/I) ratio measurement were also commonly described, however, considering the available evidence; no strong conclusions could be drawn since different methods were used to assess each parameter. By means of this literature review, a standard evaluation scheme is proposed, being helpful to regiment further investigations and comparisons on future studies.

Title: External Hexagon Deformation in Implants Subjected to Internal Torque.

Citation: Brazilian dental journal, Aug 2015, vol. 26, no. 4, p. 398-403 (August 2015)

Author(s): Magalhães, Denildo, Naves, Marina Melo, Menezes, Helder Henrique Machado, Bataglion, César, Magalhães, Guilherme Carminati, Santos Filho, Paulo César Freitas

Abstract: Failures may occur in the connections of dental implants, especially in external hexagon (EH). Due to the deformations in this portion of implants, this study aimed to evaluate the levels of deformation of EH connections subjected to internal torque. Two types of implants were used: N group and S group. Torques of 0, 32, 45, 60 and 80 Ncm were applied to the N group, and torques of 0, 30, 40, 60 and infinite Ncm were applied to the S group implants. The internal distance (ID), internal area (IA) and external area (EA) of the EH were obtained from digital pictures, which were analyzed by a specific software. Statistical analysis was performed by the Scott-Knott test. The results showed that the higher the torque applied, the greater were the changes in the evaluated dimensions in both groups. In the S group, torque levels equal or greater than 40 Ncm and 30 Ncm caused greater
deformation of EA and IA respectively, while in the N group, torque levels equal or greater than 60 Ncm and 32 Ncm caused greater deformation of EA and IA respectively. Levels of deformation were greater in the S group as compared with the N group. These findings suggest that the IA, EA and ID of the EH may be affected by different internal torque levels.
compared with the OsseoSpeed implant was observed, in particular at the implant body part with its considerable inter-thread gaps (p < .05). Concomitantly, the Aadva macro-design negatively affected the amount of bone in direct contact with the implant for this specific implant part (p < .05), and resulted in an overall impaired implant osseointegration at the initial healing stage (total implant length; 1-month healing; p < .05). Although the Aadva implant displayed a clinically acceptable level of osseointegration, the findings demonstrate that implant macro-design features can impact the dynamics of implant osseointegration. Consideration of specific implant macro-design features should be made relative to the biological and mechanical microenvironment. © 2013 Wiley Periodicals, Inc.

Title: Surface Damage on Dental Implants with Release of Loose Particles after Insertion into Bone.

Citation: Clinical implant dentistry and related research, Aug 2015, vol. 17, no. 4, p. 681-692

Author(s): Senna, Plinio, Antoninha Del Bel Cury, Altair, Kates, Stephen, Meirelles, Luiz

Abstract: Modern dental implants present surface features of distinct dimensions that can be damaged during the insertion procedure into bone. The aims of this study were (1) to quantify by means of roughness parameters the surface damage caused by the insertion procedure of dental implants and (2) to investigate the presence of loose particles at the interface. Three groups of dental implants representing different surface topographies were inserted in fresh cow rib bone blocks. The surface roughness was characterized by interferometry on the same area before and after the insertion. Scanning electron microscopy (SEM)-back-scattered electron detector (BSD) analysis was used to identify loose particles at the interface. The amplitude and hybrid roughness parameters of all three groups were lower after insertion. The surface presenting predominance of peaks (Sk [skewness] > 0) associated to higher structures (height parameters) presented higher damage associated to more pronounced reduction of material volume. SEM-BSD images revealed loose titanium and aluminum particles at the interface mainly at the crestal cortical bone level. Shearing forces during the insertion procedure alters the surface of dental implants. Loose metal particles can be generated at bone-implant interface especially around surfaces composed mainly by peaks and with increased height parameters. © 2013 Wiley Periodicals, Inc.

Title: Effect of Crown to Implant Ratio and Anatomical Crown Length on Clinical Conditions in a Single Implant: A Retrospective Cohort Study.

Citation: Clinical implant dentistry and related research, Aug 2015, vol. 17, no. 4, p. 724-731

Author(s): Sun, Shan-Pao, Moon, Ik-Sang, Park, Kwang-Ho, Lee, Dong-Won

Abstract: The aim of this retrospective cohort study was to evaluate the long-term influence of the crown-to-implant (C/I) ratio and anatomical crown length on clinical conditions around Astra single dental implants placed in the premolar and molar regions. Seventy-six subjects were selected from patients who had been treated with single Astra implants for replacement of missing premolars and molars. The peri-implant marginal bone level change was assessed 1 year after functional loading and 6 years after functional loading. To predict the peri-implant marginal bone level change using clinical and radiographic data, a multiple
linear regression model was applied. The Wilcoxon rank sum test was used to analyze difference median in technical complications. The C/I ratio and anatomical crown length were not associated with peri-implant marginal bone loss or changes in the bone level at 6 years (p = .48, p = .31). However, the modified plaque index, modified sulcus bleeding index, and smoking status influenced the peri-implant marginal bone loss (p < .05, r(2) = 0.54). In addition, the patient with technical complication group did show significantly increased anatomical crown length (p < .05) CONCLUSIONS: The higher C/I ratio and anatomical crown length did not increase the risk of peri-implant marginal bone loss during 6 years of functional loading. In addition, higher anatomical crown lengths are associated with higher technical complications. © 2013 Wiley Periodicals, Inc.

Title: Agreement between Histomorphometry and Microcomputed Tomography to Assess Bone Microarchitecture of Dental Implant Sites.

Citation: Clinical implant dentistry and related research, Aug 2015, vol. 17, no. 4, p. 732-741

Author(s): Dias, Danilo Rocha, Leles, Cláudio Rodrigues, Batista, Aline Carvalho, Lindh, Christina, Ribeiro-Rotta, Rejane Faria

Abstract: Histomorphometry and microcomputed tomography (microCT) have been used in implant studies but need better understanding before being used as equivalent methods. The purpose of this study was to investigate the agreement between 2D (histomorphometry) and 3D (microCT) reference methods for assessing jawbone microarchitecture in vivo. Forty-four bone specimens from 32 patients were obtained during implant placement and examined by microCT, followed by hematoxylin-eosin staining and histomorphometric analysis. The morphometric parameters included bone volume density (BV/TV), bone surface fraction (BS/TV), bone surface density, trabecular thickness, trabecular number, and trabecular separation (Tb.Sp). Bland-Altman plots were used for pairwise agreement analysis between the equivalent 3D and 2D parameters, and complemented with Mountain plots. The association between the two methods was tested using Pearson's correlation followed by Passing-Bablok regression. Systematic bias was observed in all Bland-Altman and Mountain plots, including constant bias for BV/TV and Tb.Sp, and proportional bias for all other parameters. Significant correlation was found for BV/TV (r = 0.80; p < .001) and BS/TV (r = 0.44; p = .003), and the Passing-Bablok regression showed constant bias for BV/TV and proportional bias for BS/TV. Because of the poor agreement between measures obtained by histomorphometry and microCT, these methods should not be used interchangeably for jawbones. © 2013 Wiley Periodicals, Inc.

Title: Bone Formation in a Local Defect around Dental Implants Coated with Extracellular Matrix Components.

Citation: Clinical implant dentistry and related research, Aug 2015, vol. 17, no. 4, p. 742-757

Author(s): de Barros, Raquel R M, Novaes, Arthur B, Korn, Paula, Queiroz, Adriana, de Almeida, Adriana L G, Hintze, Vera, Scharnweber, Dieter, Bierbaum, Susanne, Stadlinger, Bernd

Abstract: The coating of implant surfaces with components of the extracellular matrix offers an approach to influence peri-implant bone healing. In this study, bone healing around
coated implants is analyzed in a peri-implant defect model. Eight months after extraction of the premolar teeth, six dogs received 48 implants (eight per animal) in the mandible. Implant surfaces were sandblasted and acid-etched, and some were additionally coated with collagen type II and chondroitin sulfate (collagen/CS). On each side of the mandible, implants either had no peri-implant defect (control side) or a vertical defect of 5 mm in depth and 0.5, 1.0, or 2.0 mm in width. Implants healed submerged for 8 weeks. Fluorochrome staining, histology, and histomorphometry were used to analyze implant osseointegration. Fluorochrome labels showed an increased mineralization around collagen/CS-coated surfaces at 4 weeks ($p = .031$). Histomorphometry generally showed lower vertical and horizontal bone apposition with increasing gap size for both surface types. In gapless sites and 0.5-mm gaps, collagen/CS-coated implants showed increased bone volume in areas directly adjacent to the implant, in comparison with uncoated implants ($p < .05$). The width of the peri-implant gap influences peri-implant bone formation. Complete filling of all gaps by newly formed bone could not be observed around either surface. In proximity to the surface, implant surface coating by collagen/CS positively influenced bone formation. © 2013 Wiley Periodicals, Inc.

**Title:** The Effects of Exenatide Microsphere on Serum BGP and ALP Levels in ZDF Rats after Implantation.

**Citation:** Clinical implant dentistry and related research, Aug 2015, vol. 17, no. 4, p. 765-770

**Author(s):** Zhou, Wenjuan, Liu, Zhonghao, Yao, Jie, Chi, Fei, Dong, Kai, Yue, Xilong, Teng, Teng, Rausch, Xiaohui

**Abstract:** The aim of this project is to investigate the impact of diabetes mellitus and different glycemic control times on early osseointegration of dental implants by expression and significance of serum bone Gla protein (BGP) and alkaline phosphatase (ALP) levels in Zucker diabetic fatty (ZDF) rats after implantation. The animals were divided into three groups, each group with 11 rats and each rat with two dental implants (33 rats and 66 implants in total): group A, diabetic rats with dental implants (controls); group B, diabetic rats treated with insulin and implants placed simultaneously; and group C, diabetic rats treated with insulin until serum glucose at a constant level and then implants be placed. Levels of BGP and ALP in the serum were measured by enzyme-linked immunosorbent assay in each group. The software program SPSS (version 17.0 for Windows) was used to analyze all data; $p < .05$ was set as the level of statistical significance. At the 7th day, serum levels of BGP in group B and C were lower than that in group A ($p > 0.05$). At the 14th day, serum levels of BGP in group C were significantly higher ($p < 0.05$). After 30 days, compared with group A, the serum levels of BGP in group B and C seems to be lower. Compared with group A, the serum levels of ALP in group B and C were significantly higher, whereas the serum levels of ALP in group C seems to be higher than B ($p < 0.05$). The present results suggest that injection of delayed release microsphere of exenatide on ZDF rats can release exenatide at a steady rate and the blood glucose can be controlled at a constant level. Implant survival rates could be enhanced in DM subjects when blood plasma glucose level is under control; the serum levels of BGP in this study seems to have no relationship with local osseointegration, whereas the serum levels of ALP might offer insights into the activity of osseointegration around the implant surface. © 2013 Wiley Periodicals, Inc.
Title: Autologous Ilium Grafts: Long-Term Results on Immediate or Staged Functional Rehabilitation of Mandibular Segmental Defects Using Dental Implants after Tumor Resection.

Citation: Clinical implant dentistry and related research, Aug 2015, vol. 17, no. 4, p. 779-789

Author(s): Zou, Duohong, Huang, Wei, Wang, Feng, Wang, Shen, Zhang, Zhiyong, Zhang, Chenpin, Kaigler, Darnell, Wu, Yiqun

Abstract: It is a challenge for clinicians to restore oral function in patients with segmental defects of the mandible because of tumor extirpation. Dental implant therapy following vascularized autologous ilium grafts is an effective method to restore oral function in patients with mandibular segmental defects. The aim of this retrospective study was to investigate the long-term clinical outcomes of ilium grafts combined with immediate or staged mandibular dental implant therapy to restore craniofacial defects resulting from tumor resection. Over a 5-year period (2000-2004), 32 patients who underwent mandibular segmental resection for tumors were treated with vascularized ilium grafts to augment bone volume. Seventeen patients received phase I therapy (immediate placement of implants), and 15 patients underwent phase II therapy (delayed placement of implants). A total of 110 dental implants were placed in these patients for mandibular restoration of the defective areas. Information regarding implant success and survival rates, marginal bone loss, soft tissue inflammation, complications of prosthesis, and patient satisfaction for the 8 to 12 years following oral reconstruction was obtained from patient records. Although there was mild evidence of bone graft resorption, the vascularized autogenous ilium bone grafts were successful in all patients. The cumulative patient survival and success rate of the implants were 96.4% and 91.8%, respectively. The mean peri-implant bone resorption ranged from 1.0 to 1.2 mm over the 8- to 12-year follow-up period. The annual mean number of complications/repairs was from 0.11 to 0.07 per patient during the 8- to 12-year follow-up. Over 80% of the patients were fully satisfied with their restoration of oral function. This study demonstrates that reconstruction of mandibular segmental defects because of resection of mandibular tumors using dental implants therapy combined with vascularized autogenous ilium grafts is an effective method to restore oral function. © 2013 Wiley Periodicals, Inc.

Title: Importance of Crown Height Ratios in Dental Implants on the Fracture Strength of Different Connection Designs: An In Vitro Study.

Citation: Clinical implant dentistry and related research, Aug 2015, vol. 17, no. 4, p. 790-797

Author(s): Gehrke, Sergio Alexandre

Abstract: The aim of the present in vitro study was to assess the resistance to static fatigue of implants with different connections at various crown heights. Sixty conical implants and 60 abutments were used with the smallest diameters available for each model. Three groups (n = 20) were established based on the implant connections: Morse taper Ø3.50 mm (group 1), external hexagon Ø3.50 mm (group 2), and internal hexagon Ø3.50 mm (group 3). Four crown heights were tested: h1 = 8 mm, h2 = 10 mm, h3 = 12 mm, and h4 = 14 mm. All groups were subjected to quasi-static loading at a 30° angle to the implant axis in a universal testing machine. The mean fracture strengths for group 1 were 1524 N (h1 ), 1469 N (h2 ), 750 N (h3 ), and 729 N (h4 ). Those for group 2 were 1504 N (h1 ), 814 N (h2 ), 491 N (h3 ),
and 325 N (h4). Those for group 3 were 1543 N (h1), 672 N (h2), 403 N (h3), and 390 N (h4). Resistance to loading decreases significantly with increasing crown height, and the connection design can affect the performance. © 2013 The Author. Clinical Implant Dentistry and Related Research published by Wiley Periodicals, Inc.

Title: No Evidence of Genotoxic Damage in a Group of Patients with Titanium Dental Implants and Different Metal Restorations in the Oral Cavity.

Citation: Clinical implant dentistry and related research, Aug 2015, vol. 17, no. 4, p. 811-821

Author(s): Camacho-Alonso, Fabio, Sánchez-Siles, Mariano, Gilbel-Del Águila, Osmundo

Abstract: Titanium is the most widely used metal in implant dentistry. In spite of its biocompatibility, when it is released into the oral environment, it can have local negative biological effects. The aims of this study were to detect the concentration of metal ions in patients with dental implants, to evaluate whether or not their release might be influenced by the presence of other metals, and to assay whether these ions might provoke genotoxic damage in oral mucosa cells. One hundred five patients with a total of 180 dental implants were included. The sample was divided into seven groups (n = 15 per group). Group 1 consisted of patients with metal-porcelain fixed crowns on dental implants; Group 2, patients with metal-porcelain fixed crowns on teeth; Group 3, patients with dental amalgams; Group 4, patients with metal-porcelain fixed crowns on dental implants and metal-porcelain fixed crowns on teeth; Group 5, patients with metal-porcelain fixed crowns on dental implants and dental amalgams; and Group 6, patients with metal-porcelain fixed crowns on dental implants, metal-porcelain fixed crowns on teeth, and dental amalgams. Group 7 was the control group, without any dental treatment. The concentration of metal ions was detected using inductively coupled plasma mass spectrometry; genotoxicity was measured using the buccal micronucleus cytome assay protocol. Group 5 displayed the highest concentration of metal ions in parts per billion (Ti, Co, Ni, Zn, Pd, Sn, and Pb). Group 6 was characterized by the highest presence of Hg. No signs of genotoxic damage were found in any of the study groups. Patients with titanium dental implants combined with other metal restorations presented higher concentrations of metal ions, but no genotoxic damage was observed in oral mucosal epithelial cells. © 2013 Wiley Periodicals, Inc.

Title: Comparison of two dental implant surface modifications on implants with same macrodesign: an experimental study in the pelvic sheep model.

Citation: Clinical oral implants research, Aug 2015, vol. 26, no. 8, p. 898-908 (August 2015)

Author(s): Ernst, Sabrina, Stübinger, Stefan, Schüpbach, Peter, Sidler, Michèle, Klein, Karina, Ferguson, Stephen J, von Rechenberg, Brigitte

Abstract: The aim of this study was to compare two different surfaces of one uniform macro-implant design in order to focus exclusively on the osseointegration properties after 2, 4 and 8 weeks and to discuss the animal model chosen. In six mature sheep, n = 36 implants with a highly crystalline and phosphate-enriched anodized titanium oxide surface (TiU) and n = 36 implants with a hydrophilic, sandblasted, large grit and acid-etched surface (SLA) were placed in the pelvic bone. TiU implants were custom-made to match the SLA implant design. The implant stability and bone-to-implant contact (BIC) were assessed by
resonance frequency (ISQ), backscatter scanning electron microscopy (B-SEM), light microscopy (LM), micro-CT and intravital fluorochrome staining. Biomechanical removal torque testing was performed. Overall, no statistically significant differences in BIC total (trabecular + cortical) between TiU and SLA were found via LM and B-SEM. BIC values (B-SEM; LM) in both groups revealed a steady rise in trabecular bone attachment to the implant surface after 2, 4 and 8 weeks. In the 2- to 4-week time interval in the TiU group \( (P = 0.005) \) as well as in the SLA group \( (P = 0.01) \), a statistically significant increase in BIC trabecular could be observed via LM. B-SEM values confirmed the statistically significant increase for TiU \( (P = 0.001) \). In both groups, BIC trabecular values after 8 weeks were significantly higher \( (P \leq 0.05) \) than after 2 weeks (B-SEM; LM). Biomechanical data confirmed the histological data. The two surfaces proved comparable osseointegration in this sheep model. © 2014 John Wiley & Sons A/S. Published by John Wiley & Sons Ltd.

**Title:** UV-A and UV-C light induced hydrophilization of dental implants.

**Citation:** Dental materials : official publication of the Academy of Dental Materials, Aug 2015, vol. 31, no. 8, p. e157.

**Author(s):** Al Qahtani, Mohammed S A, Wu, Yanyun, Spintzyk, Sebastian, Krieg, Peter, Killinger, Andreas, Schweizer, Ernst, Stephan, Ingrid, Scheideler, Lutz, Geis-Gerstorfer, Jürgen, Rupp, Frank

**Abstract:** Wettability is increasingly considered to be an important factor determining biological responses to implant materials. In this context, the purpose of this study was to compare the dynamic wettability of dental implants made from different bulk materials and modified by different surface modifications, and to analyze the respective changes of wettability upon irradiating these implants by UV-A or UV-C light. Four original screw-type implants were investigated: One grit-blasted/acid-etched and one anodically oxidized titanium, one zirconia and one polyetheretherketone implant. Additionally, experimental, screwless, machined titanium cylinders were included in the study. Part of that cylinders and of blasted/etched implants were further modified by a magnetron-sputtered photocatalytic anatase thin film. Scanning electron microscopy was used to investigate the surface micro- and nanostructures. Samples were treated by UV-A \( (382\text{nm}, 25\text{mWcm}^{-2}) \) and UV-C \( (260\text{nm}, 15\text{mWcm}^{-2}) \) for entire 40min, respectively, and their wettability was quantified by dynamic contact angle (CA) analysis from multi-loop Wilhelmy experiments. All implants are characterized by submicron- and nanosized surface features. Unexposed implants were hydrophobic \( (\text{CA}>90^\circ) \). Upon UV-A, solely the implants with anatase coating became superhydrophilic \( (\text{CA}<5^\circ) \). Upon UV-C, the blasted/etched implants turned superhydrophilic, the anodized titanium and the zirconia implants were considerably \( (\text{CA}=34^\circ \text{ and } 27^\circ, \text{ respectively}) \) and the PEEK implants slightly \( (\text{CA}=79^\circ) \) hydrophilized. The wettability of implant surfaces can be improved by UV irradiation. The efficiency of UV-A and UV-C irradiation to lower the CA by photocatalysis or photolysis, however, is strongly dependent on the specific material and surface. Thus, attempts to photofunctionalize these surfaces by irradiation is expected to result in a different pattern of bioresponses. Copyright © 2015 Academy of Dental Materials. Published by Elsevier Ltd. All rights reserved.
**Title:** High-Performance Polymers and Their Potential Application as Medical and Oral Implant Materials: A Review.

**Citation:** Implant dentistry, Aug 2015, vol. 24, no. 4, p. 448-457 (August 2015)

**Author(s):** Wiesli, Matthias Guido, Özcan, Mutlu

**Abstract:** To review the literature on high-performance polymeric (HPP) materials used as medical and oral implants and make comparisons with the commonly used titanium. Original scientific articles published in English in MEDLINE (PubMed-NCBI) and Picarta literature databases between January 01, 1995 and June 01, 2013 were included in this review. Additional information was derived from scientific reports, medical and chemical textbooks, handbooks, product information, manufacturers' instructions, and Internet web sites of the manufacturers. Based on the 7 animal studies and 1 clinical study, HPP polyetheretherketone (PEEK) consisting of a single monomer and featuring a low Young modulus may be advantageous. PEEK seems to lead to less osteolyses and healing problems and no scattering in radiation was observed. Some animal studies showed direct contact between PEEK and the bone with high biocompatibility and no evidence for cytotoxicity, mutagenicity, carcinogenicity, and immunogenicity to the present day. The HPPs (ie, PEEK) may carry some potential to be an alternative material for titanium as medical and dental implants. Yet, clinical and animal studies are limited in the field of implantology with such materials.

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**Title:** Rapid and Easy Histological Evaluation of Alveolar Human Bone Quality at Dental Implant Sites Using a Nondecalcified Frozen Cryofilm Section Technique: A Technical Report.

**Citation:** Implant dentistry, Aug 2015, vol. 24, no. 4, p. 477-479

**Author(s):** Ito, Yuichi, Fujita, Hiroshi, Kanou, Miwa, Takahashi-Nakagawa, Yasuko, Nakajima, Yoichiro, Sunano, Akihiro, Kimura, Yoshihiro, Ueno, Takaaki

**Abstract:** The evaluation of bone quality at the site of the alveolar bone for a dental implant is very important. This study presents an easy technique for direct evaluation of alveolar bone quality using nondecalcified cryofilm frozen sections on human alveolar bone core samples. Core samples harvested from alveolar bone were immediately frozen in cooled hexanen and slowly cut using a disposable tungsten carbide blade; the sliced sections were collected with adhesive cryofilms. Staining was performed using von toluidine blue and von Kossa for microscopic observations. All core samples clearly showed bone structure components of cortical bone, trabecular bone, bone marrow, blood vessels, and bone-related cells. These results suggest the efficacy of a nondecalcified cryofilm frozen section technique for histological observation of surgical implant sites.

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**Title:** Oral Rehabilitation With Orthognathic Surgery After Dental Implant Placement for Class III Malocclusion With Skeletal Asymmetry and Posterior Bite Collapse.

**Citation:** Implant dentistry, Aug 2015, vol. 24, no. 4, p. 487-490 (August 2015)

**Author(s):** Ohba, Seigo, Nakatani, Yuya, Kawasaki, Takako, Tajima, Nobutaka, Tobita, Takayoshi, Yoshida, Noriaki, Sawase, Takashi, Asahina, Izumi
Abstract: Increasing numbers of older patients are seeking orthognathic surgery to treat jaw deformity. However, orthodontic and orthognathic surgical treatment is difficult in cases without occlusal vertical stop. A 55-year-old man presented with Class III malocclusion and mandibular protrusion including esthetic problems and posterior bite collapse. He underwent dental implant treatment to reconstruct an occlusal vertical stop before orthognathic surgery. His occlusal function and esthetic problems improved after surgery, and his skeletal and occlusal stability has been maintained for 6 years. Dental implant placement at appropriate positions could help to determine the position of the proximal segment at orthognathic surgery and could shorten the time required to restore esthetic and occlusal function. This case demonstrates how skeletal and dental stability can be maintained long after surgery in a patient with jaw deformity and posterior bite collapse.

Title: Progressive plateau root form dental implant osseointegration: A human retrieval study.

Citation: Journal of biomedical materials research. Part B, Applied biomaterials, Aug 2015, vol. 103, no. 6, p. 1328-1332 (August 2015)

Author(s): Gil, Luiz F, Suzuki, Marcelo, Janal, Malvin N, Tovar, Nick, Marin, Charles, Granato, Rodrigo, Bonfante, Estevam A, Jimbo, Ryo, Gil, Jose N, Coelho, Paulo G

Abstract: Although preclinical and sparse human histology retrieval studies have shown that the interface between implant and bone is constantly remodeling, no human retrieval database has been developed to determine the effect of functional loading time and other clinical/implant design variables on osseointegration. The present study tested the hypothesis that bone-to-implant contact (BIC) and bone area fraction occupancy (BAFO) increase over functional loading time around dental implants. Due to prosthetic retreatment reasons, 93 human implant retrievals from the same manufacturer (Bicon LLC, Boston, MA, USA) were obtained over a period of approximately 15 years. The retrieved implants were under functional loading from 120 days to ∼18 years and were histomorphologic/metrically evaluated. BIC/BAFO were assessed as a function of multiple independent variables: implant surface type, diameter, length, jaw (maxilla/mandible), region (anterior/posterior), and time of functional loading. The results showed that both BIC and BAFO increased over time independently of implant design/clinical variables, supporting the postulated hypothesis. © 2014 Wiley Periodicals, Inc. J Biomed Mater Res Part B: Appl Biomater, 103B: 1328-1332, 2015. © 2014 Wiley Periodicals, Inc.

Title: Nanoadhesion of Staphylococcus aureus onto Titanium Implant Surfaces.

Citation: Journal of dental research, Aug 2015, vol. 94, no. 8, p. 1078-1084 (August 2015)

Author(s): Aguayo, S, Donos, N, Spratt, D, Bozec, L

Abstract: Adhesion of bacteria to dental implant surfaces is the critical initial step in the process of biofilm colonization; however, the specific nanoadhesive interactions occurring during the first contact between bacterial cells and biomaterial substrates remain poorly understood. In this report, we utilize single-cell force spectroscopy to characterize the dynamics of the initial interaction between living Staphylococcus aureus cells and machined titanium surfaces at the nanoscale. Values for maximum adhesion force were found to
increase from 0-s (-0.27 ± 0.30 nN) to 60-s (-9.15 ± 0.78 nN) surface delays, with similar results observed for total adhesion work (7.39 ± 2.38 and 988.06 ± 117.08 aJ, respectively). Single unbinding events observed at higher surface delays were modeled according to the wormlike chain model, obtaining molecular contour-length predictions of 314.06 ± 9.27 nm. Average single-bond rupture forces of -0.95 ± 0.04 nN were observed at increased contact times. Short- and long-range force components of bacterial adhesion were obtained by Poisson analysis of single unbinding event peaks, yielding values of -0.75 ± 0.04 and -0.58 ± 0.15 nN, respectively. Addition of 2-mg/mL chlorhexidine to the buffer solution resulted in the inhibition of specific adhesive events but an increased overall adhesion force and work. These results suggest that initial attachment of S. aureus to smooth titanium is mostly mediated by short-range attractive forces observed at higher surface delays. © International & American Associations for Dental Research 2015.

**Title:** Maxillary Sinus Membrane Repair With Amnion-Chorion Barriers: A Retrospective Case Series.

**Citation:** Journal of periodontology, Aug 2015, vol. 86, no. 8, p. 936-940 (August 2015)

**Author(s):** Holtzclaw, Dan

**Abstract:** Schneiderian membrane perforation is the most common complication of maxillary sinus augmentation procedures and has been associated with a variety of post-surgical problems. Multiple techniques to repair perforated Schneiderian membranes with materials such as connective tissue, buccal fat pads, and resorbable collagen membranes have been reported in the dental literature. Although these reparative options have proven successful, they are technique sensitive and time consuming. The aim of this case series is to present a simplified method of Schneiderian membrane perforation repair with amnion-chorion membranes and results obtained from nine cases using this technique. A consecutive retrospective record review was performed of all maxillary sinus augmentation cases performed during the past 5 years by the same board-certified private practice periodontist (DH). Seventy-seven cases were identified, with a total of 104 sinus augmentations, in which nine perforations were noted. None of the perforation cases were aborted midprocedure, and all perforations were repaired with amnion-chorion membranes. All cases were augmented with a combination of allograft and xenograft particulate bone. After an average healing time of 4.9 months, dental implants were placed in the grafted sinuses. This retrospective case series shows nine perforations during 104 lateral window maxillary sinus augmentation procedures. A total of 23 dental implants were placed in the augmented sinuses with perforated Schneiderian membranes, and one failure was noted according the Albrektsson success criteria. A total of 158 dental implants were placed in non-perforated augmented sinuses, with a total of three failures noted.

**Title:** Evaluation of Peri-Implant Bone Response in Implants Retrieved for Fracture After More Than 20 Years of Loading: A Case Series.

**Citation:** The Journal of oral implantology, Aug 2015, vol. 41, no. 4, p. 414-418, 0160-6972

**Author(s):** Mangano, Carlo, Piattelli, Adriano, Mortellaro, Carmen, Mangano, Francesco, Perrotti, Vittoria, Iezzi, Giovanna
Abstract: Analysis of human retrieved dental implants is a useful tool in the evaluation of implant success and failure. More human histological data are needed from samples of long-term implant service. The aim of the present case series was a histological and histomorphometrical evaluation of the peri-implant bone responses in implants retrieved for fracture after more than 20 years loading. The archives of the Implant Retrieval Center of the Department of Medical, Oral and Biotechnological Sciences of the University of Chieti-Pescara, Italy were searched. A total of 5 implants, retrieved after a loading period of more than 20 years, were found: 2 had been retrieved after 20 years, 1 after 22 years, 1 after 25 years, and 1 after 27 years. All these implants were histologically processed. Compact, mature bone in close contact with the implant surface was observed in all specimens, with no gaps or connective tissue at the interface. Bone in different maturation stages was found around some implants. Primarily newly formed bone was observed in proximity of the implant surface, while mature compact bone with many remodeling areas and cement lines were detected in areas distant from the implant. Many primary and secondary osteons were present. Bone to implant contact percentage varied from 37.2% to 76%. In conclusion, histology and histomorphometry showed that even after many years of function, all implants presented more than adequate bone to implant contact and they appeared to be very well integrated in the peri-implant bone.

Title: Instrumentation With Ultrasonic Scalers Facilitates Cleaning of the Sandblasted and Acid-Etched Titanium Implants.

Citation: The Journal of oral implantology, Aug 2015, vol. 41, no. 4, p. 419-428, 0160-6972

Author(s): Park, Jun-Beom, Lee, Sung-Hoon, Kim, NamRyang, Park, Seojin, Jin, Seong-Ho, Choi, Bong-Kyu, Kim, Kack-Kyun, Ko, Youngkyung

Abstract: Mechanical instrumentation is widely used to debride dental implants, but this may alter the surface properties of titanium, which in turn may influence bacterial adhesion and make it more difficult to remove the biofilm. This in vitro study was performed (1) to assess the amount of biofilm formation on a sand-blasted and acid-etched titanium fixture treated with ultrasonic scalers with metal, plastic, and carbon tips and (2) to evaluate how this treatment of titanium surfaces affects implant cleaning by brushing with dentifrice. The titanium fixtures were treated with various ultrasonic scaler tips, and surface roughness parameters were measured by confocal microscopy. Biofilm was formed on the treated fixtures by using pooled saliva from 10 subjects, and the quantity of the adherent bacteria was compared with crystal violet assay. The fixture surfaces with biofilm were brushed for total of 30 seconds with a toothbrush with dentifrice. The bacteria remaining on the brushed fixture surfaces were quantified by scanning electron microscopy. Surface changes were evident, and the changes of the surfaces were more discernible when metal tips were used. A statistically significant decrease in roughness value (arithmetic mean height of the surface) was seen in the 2 metal-tip groups and the single plastic-tip group. After brushing with dentifrice, the treated surfaces in all the treatment groups showed significantly fewer bacteria compared with the untreated surfaces in the control group, and the parts of the surfaces left untreated in the test groups. Within the limits of this study, treatment of titanium fixture surfaces with ultrasonic metal, plastic, or carbon tips significantly enhanced the bacterial removal efficacy of brushing. Thorough instrumentation that smooths the whole exposed surface may facilitate maintenance of the implants.
Title: Adjunctive Orthodontic Applications in Dental Implantology.

Citation: The Journal of oral implantology, Aug 2015, vol. 41, no. 4, p. 501-508, 0160-6972

Author(s): Farahani, Ali, Zadeh, Homayoun H

Abstract: Implant placement is often necessitated for replacement of teeth with pathologically damaged alveolar bone due to periodontitis or traumatic injury. Surgical augmentation of resorbed bone has many limitations, including lower efficacy of vertical augmentation than horizontal augmentation, as well as morbidity associated with grafting procedure. Orthodontic therapy has been proposed as a useful method for augmenting the resorbed alveolar bone and reforming aesthetically appealing gingival margin, prior to implant placement. This narrative review summarizes the available evidence for the application of orthodontic strategies that can be used as adjunct in selected cases to augment bone volume for the future implant site and maintain space for the prosthetic parts of the implant. These are (1) orthodontic extrusion of compromised teeth to generate vertical bone volume and enhance gingival architecture, (2) tooth preservation and postponing orthodontic space opening to maintain bone volume in future implant site, (3) orthodontic implant site switching to eliminate the deficient bone volume or risky implant sites, and (4) the provision of a rigid fixed-bonded retainer to maintain the implant site. Although there are no randomized controlled clinical trials to evaluate the efficacy of orthodontic therapy for implant site development, clinical case reports and experience document the efficacy of orthodontic therapy for this application.

Title: Use of an Intraoral Laser Scanner During the Prosthetic Phase of Implant Dentistry: A Pilot Study.

Citation: The Journal of oral implantology, Aug 2015, vol. 41, no. 4, p. e126., 0160-6972

Author(s): Lee, Cameron Y S, Wong, Natalie, Ganz, Scott D, Mursic, Jonathan, Suzuki, Jon B

Abstract: The accuracy of a digital impression technique to fabricate the implant restoration and abutment for a dental implant using an intraoral laser scanner was evaluated in 36 patients who were missing a single posterior tooth in either the mandible or maxilla that was restored with a single implant. The spatial position of each integrated implant, including the surrounding anatomic hard and soft tissues of adjacent structures, was captured utilizing a special scanning abutment with an intraoral laser scanner. Data from the scanning protocol was then delivered via the Internet in the form of an STL file to the manufacturing site for the production of a custom computer-aided design abutment and crown. All 36 restorations and abutments were delivered to the patients and evaluated for marginal integrity, interproximal contact points, and occlusion. Of the 36 patients, 6 required contact adjustments, 7 required occlusal adjustments, and 3 required a gingivectomy around the implant to completely seat the restoration. Chair time for adjustments did not exceed 15 minutes. The findings suggest that an intraoral laser scanner can be used with confidence to obtain consistent and accurate digital impressions to fabricate custom restorations and abutments for dental implants.
**Title:** Mini Implants Supporting Fixed Partial Dentures in the Posterior Mandible: A Retrospective.

**Citation:** The Journal of oral implantology, Aug 2015, vol. 41, no. 4, p. e138., 0160-6972

**Author(s):** Flanagan, Dennis

**Abstract:** Small-diameter, or mini, dental implants have been successfully used to support removable and fixed oral prostheses. These implants impart about twice the per-square-millimeter force on the supporting bone and this should be addressed during treatment planning. In the posterior jaws, bite forces are of a higher magnitude than in the anterior jaws and may induce an overload of the supporting bone and failure of the osseointegration. Thus there should not be occlusal contact in functional excursions that induce off axial loads. The cases presented herein demonstrate that mini dental implants may be used successfully to support fixed partial dentures in mandibular sites in highly selected patients. Attention should be given to the bone density of the site, very slow seating rotation of the implant with intermissions or cooling during insertion, observation of a 4-month healing time, flapless placement, treatment of any existing periodontitis, an insoluble cement, and exclusion of occlusal contact in functional excursions. Importantly, a narrow, rounded occlusal table should be used to minimize off axial loads and an insoluble luting cement should be used to prevent loosening of the crowns due to dissolution of the cement and an overload of the retained implant with any residual cement-retained in the retainer. The implant that supports the cement retained retainer will be subjected to leveraged rotation that may destroy the osseointegration and result in exfoliation of the implant.

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**Title:** Using the "final-on-four" concept to deliver an immediate metal-resin implant-fixed complete dental prosthesis.

**Citation:** The Journal of prosthetic dentistry, Aug 2015, vol. 114, no. 2, p. 161-166

**Author(s):** Yilmaz, Burak, Ozcelik, Tuncer Burak, McGlumphy, Edwin

**Abstract:** In traditional dental implant therapy, the time between implant placement and delivery of the definitive prosthesis can be long and uncomfortable for a patient wearing a conventional removable denture on an atrophied ridge. New clinical protocols, often with tilted implants, are being used to immediately restore mandibular implants with interim restorations, thus shortening the patient’s return to function. However, these conversion type interim restorations do not decrease the time to definitive prosthetic rehabilitation. The Ohio State University (OSU) developed an immediate load surgical and prosthetic protocol to compensate for the disadvantages of previous techniques. With this protocol, a custom, definitive, screw-retained metal-resin fixed prosthesis can be delivered 2 to 4 days postoperatively and has been described using 5 implants. This clinical report presents the OSU immediate loading protocol, combined with a tilted implant technique, for the fabrication of a mandibular metal-resin implant fixed complete dental prosthesis (MRIFCDP) in 3 days postoperatively and with only 4 implants. Replacing the mandibular dentition with an immediate load-fixed metal-resin prosthesis by means of the "final-on-four" technique resulted in a custom, definitive, and functional restorative solution immediately after surgery. Copyright © 2015 Editorial Council for the Journal of Prosthetic Dentistry. Published by Elsevier Inc. All rights reserved.
Abstract: Dental implants can be a successful replacement option for missing teeth, improving masticatory and speech function and aesthetics. The methods in which the long-term success of dental implants and osseointegration can be achieved are discussed in this article. [PUBLICATION] 7 references
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http://www.nature.com/ebd/journal/v16/n2/index.html

http://www.quintpub.com/journals/omi/journal_contents.php?journal_name=OMI&current=1#.VgEBwtJVhBc
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