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Restorative Dentistry

Current Awareness Newsletter

December - January 2017

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December (12.00)
Fri 16th   **Literature Searching**
Mon 20th   **Critical Appraisal**

January (13.00)
Tues 10th   **Literature Searching**
Wed 18th   **Critical Appraisal**
Thur 26th   **Statistics**

February (12.00)
Fri 3rd   **Literature Searching**
Mon 6th   **Critical Appraisal**
Tues 14th   **Statistics**
Wed 22nd   **Literature Searching**

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Contents

The Latest Evidence for Restorative Dentistry

NICE National Institute for Health and Care Excellence

Does a higher glycemic level lead to a higher rate of dental implant failure?: A meta-analysis
Source: PubMed - 01 November 2016
...association between the implant failure rate...patients and 587 dental implants. The results...diabetes and the dental implant failure rate...experienced late implant failure, the...failure rates for dental implants between patients...
Read Summary

Quality assessment of systematic reviews regarding immediate placement of dental implants into infected sites: An overview
Source: PubMed - 08 November 2016
...be considered. In implant dentistry, one topic...immediate placement of dental implants into infected sites...

Efficacy of bisphosphonate as an adjunct to nonsurgical periodontal therapy in the management of periodontal disease: a systematic review
10 November 2016 - Publisher: British Journal of Clinical Pharmacology
Review of 8 studies found adjunctive bisphosphonate therapy appears to be effective in managing periodontitis, however, due to the potential risk of osteonecrosis of the jaw and short-term follow-up of the studies, their clinical application is debatable.

The Current Weight of Evidence of the Microbiologic Profile Associated With Peri-Implantitis: A Systematic Review
Source: PubMed - 01 November 2016
...that may be considered true peri-implant pathogens. Therefore...microorganisms related to peri-implantitis based on results of association...implants and implants with peri-implantitis. RESULTS: A total of 799...abundance/frequency in peri-implantitis belonged to Bacteria domain...
Read Summary

Cochrane Library

Rubber dam isolation for restorative treatment in dental patients
Yan Wang, Chunjie Li, He Yuan, May CM Wong, Jing Zou, Zongdao Shi, Xuedong Zhou
Online Publication Date: September 2016

UpToDate®

Gingivitis and periodontitis in adults: Classification and dental treatment

Authors: Rebecca S Wilder, BSDH, MS, Antonio J Moretti, DDS, MS

Literature review current through: Nov 2016. | **This topic last updated:** Apr 25, 2016.

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. (See "Epidemiology, pathogenesis, and clinical manifestations of odontogenic infections" and "Complications, diagnosis, and treatment of odontogenic infections".)

Medication-related osteonecrosis of the jaw in patients with cancer

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

Literature review current through: Nov 2016. | **This topic last updated:** Oct 13, 2016.

This topic review will describe the incidence, risk factors, staging, clinical course, prevention strategies, and management of MRONJ in patients with cancer who are receiving antiresorptive agents. The incidence, risk factors, and management strategies for MRONJ in patients receiving antiresorptive therapy for osteoporosis and other side effects associated with bisphosphonates and denosumab in patients with cancer are addressed elsewhere. (See "Denosumab for osteoporosis", section on 'Oversuppression of bone remodeling' and "Risks of therapy with bone antiresorptive agents in patients with advanced malignancy".)

Management of late complications of head and neck cancer and its treatment

Authors: Thomas Galloway, MD Robert J Amdur, MD

All topics are updated as new evidence becomes available and our peer review process is complete.

Literature review current through: Nov 2016. | **This topic last updated:** Sep 30, 2016.

This topic will review the late complications of treatment for head and neck cancer. The care of patients with head and neck cancer during initial therapy, both to treat acute toxicity and to prevent late complications, is discussed separately. (See "Management and prevention of complications during initial treatment of head and neck cancer", section on 'Amifostine' and "Management and prevention of complications during initial treatment of head and neck cancer", section on 'Submandibular gland transfer'.)

The Dental Elf

Dental Implants: microthreads in crestal area and marginal bone loss.

DEC 2 2016

Dental implants are increasing seen as an effective restorative option with survival rate over 90% in the long term. While case selection is important implant design is also considered to have an impact on survival and manufacturers have claimed that microthreads in the crestal portion can reduce marginal bone loss (MBL) around implants.

The aim of this review was to investigate the marginal bone loss around dental implants with and without microthreads in the neck.

Gingival recession: long term outcomes of no treatment

DEC 7 2016
Gingival recession (GR) leads to the exposure of the tooth root owing to displacement of the gingival margin apical to the cemento-enamel junction While and range of techniques are available to treat GR as while they do not improve they may not progress to tooth loss although aesthetics may be impaired along with increased sensitivity.
The main aim of this review was to assess the long-term outcomes of untreated buccal gingival recession (GR) defects and the associated reported aesthetic and functional alterations.

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Current Awareness Database Articles on Restorative Dentistry

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

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

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Peri-implantitis

A case of peri-implantitis and osteoradionecrosis arising around dental implants placed before radiation therapy.

Author(s): Teramoto, Yuji; Kurita, Hiroshi; Kamata, Takahiro; Aizawa, Hitoshi; Yoshimura, Nobuhiko; Nishimaki, Humihiro; Takamizawa, Kazunobu

Source: International journal of implant dentistry; Dec 2016; vol. 2 (no. 1); p. 11

Abstract: A little is known about the effect of radiotherapy on the dental implants that have previously been osseointegrated and charged. Here, we reported a case of osteoradionecrosis which arose around dental implants placed before radiation therapy.

A Novel Treatment Decision Tree and Literature Review of Retrograde Peri-Implantitis.

Author(s): Sarmast, Nima D; Wang, Howard H; Soldatos, Nikolaos K; Angelov, Nikola; Dorn, Samuel; Yukna, Raymond; Iacono, Vincent J

Source: Journal of periodontology; Dec 2016; vol. 87 (no. 12); p. 1458-1467

Abstract: Although retrograde peri-implantitis (RPI) is not a common sequela of dental implant surgery, its prevalence has been reported in the literature to be 0.26%. Incidence of RPI is reported to increase to 7.8% when teeth adjacent to the implant site have a previous history of root canal therapy, and it is correlated with distance between implant and adjacent tooth and/or with time from endodontic treatment of adjacent tooth to implant placement. Minimum 2 mm space between implant and adjacent tooth is needed to decrease incidence of apical RPI, with minimum 4 weeks between completion of endodontic treatment and actual implant placement. The purpose of this study is to compile all available treatment modalities and to provide a decision tree as a general guide for clinicians to aid in diagnosis and treatment of RPI.   Literature search was performed for articles published in English on the topic of RPI. Articles selected were case reports with study populations ranging from 1 to 32 patients. Any case report or clinical trial that attempted to treat or rescue an implant diagnosed with RPI was included. Predominant diagnostic presentation of a lesion

was presence of sinus tract at buccal or facial abscess of apical portion of implant, and subsequent periapical radiographs taken demonstrated a radiolucent lesion. On the basis of case reports analyzed, RPI was diagnosed between 1 week and 4 years after implant placement. Twelve of 20 studies reported that RPI lesions were diagnosed within 6 months after implant placement. A step-by-step decision tree is provided to allow clinicians to triage and properly manage cases of RPI on the basis of recommendations and successful treatments provided in analyzed case reports. It is divided between symptomatic and asymptomatic implants and adjacent teeth with vital and necrotic pulps. Most common etiology of apical RPI is endodontic infection from neighboring teeth, which was diagnosed within 6 months after implant placement. Most common findings, radiographically and clinically, are lesions around implant apex and sinus tract. A small number of implants did not improve with treatment. Decision tree provides a path to diagnose and treat lesions to facilitate their management. Further studies are needed to focus on histologic data around periapical microbiota to establish specific etiology and differential diagnoses compared with marginal peri-implantitis and other implant-related conditions.

Could cytokine levels in the peri-implant crevicular fluid be used to distinguish between healthy implants and implants with peri-implantitis? A systematic review.

Author(s): Duarte, P M; Serrão, C R; Miranda, T S; Zanatta, L C S; Bastos, M F; Faveri, M; Figueiredo, L C; Feres, M

Source: Journal of periodontal research; Dec 2016; vol. 51 (no. 6); p. 689-698

Abstract: Despite investigative efforts to identify the levels of different types of cytokines in the peri-implant crevicular fluid (PICF), the efficacy of these biomarkers in assisting the diagnosis of peri-implantitis is still undetermined. This systematic review aimed to answer the following question: "Could cytokine levels in the PICF be used to distinguish between healthy implants and implants with peri-implantitis?" This review was conducted and reported in accordance with the PRISMA statement. The MEDLINE and EMBASE databases were searched from 1990 up to and including March 2015, using MeSH terms and other keywords. Additional publications were searched using a hand search of reference lists of relevant studies. Titles and abstracts were screened and papers that fulfilled eligibility criteria were assessed. Out of 1212 titles, 18 studies reporting the levels of nine different cytokines were included. Proinflammatory cytokines [interleukin (IL)-1β, IL-6, IL-12, IL-17 and tumor necrosis factor-α) were the cytokines studied most commonly, followed by anti-inflammatory cytokines (IL-4 and IL-10), osteoclastogenesis-related cytokines (RANKL) and chemokines (IL-8). Nine studies reported statistically significantly higher levels of proinflammatory cytokines in the PICF of implants with peri-implantitis than in the PICF of healthy implants. Most studies did not find any significant differences in the PICF levels of anti-inflammatory cytokines and RANKL between healthy implants and implants with peri-implantitis. IL-8 was the only chemokine studied and its levels did not differ significantly between healthy and diseased implants. The studies differed greatly in the manner in which they reported the results (e.g. concentrations or total amounts) and in the exclusion of confounders, such as smoking. The results of this systematic review indicate moderate evidence in the literature to support that implants with peri-implantitis present higher levels of proinflammatory cytokines in the PICF than do healthy implants. Evidence regarding the PICF levels of anti-inflammatory cytokines, osteoclastogenesis-related cytokines and chemokines as possible predictors of peri-implantitis is too limited. © 2016 John Wiley & Sons A/S. Published by John Wiley & Sons Ltd.

Expression of IL-6, IL-10, IL-17 and IL-33 in the peri-implant crevicular fluid of patients with peri-implant mucositis and peri-implantitis.

Author(s): Severino, Viviane Oliveira; Beghini, Marcela; de Araújo, Márcia Fernandes; de Melo, Marcelo Luiz Ribeiro; Miguel, Camila Botelho; Rodrigues, Wellington Francisco; de Lima Pereira, Sanivia Aparecida

Abstract: The aim of this study was to compare the levels of IL-6, IL-10, IL-17 and IL-33 in the peri-implantar crevicular fluid (PICF) and in parotid gland saliva (PGS) of healthy patients, and peri-implantitis and peri-implant mucositis patients.   The PICF was collected from 40 implants as follows: 10 peri-implant mucositis patients, 20 peri-implantitis patients and 10 healthy patients. The PICF and PGS samples collected from each patient were quantified for IL-6, IL-10, IL-17 and IL-33 by enzymatic immunosorbent assay (ELISA). IL-6, IL-17 and IL-33 levels on PIFC were significantly higher in peri-implantitis group when compared to healthy group. IL-17 and IL-33 levels in PIFC were significantly higher in peri-implant mucositis group than in healthy group. There was no significant difference when comparing IL-6, IL-10, IL-17 and IL-33 levels in PGS among healthy, peri-implant mucositis and peri-implantitis groups.   Therefore, as in patients with peri-implantitis there were significantly higher levels of IL-6, IL-17 and IL-33 in PICF, we believe that these cytokines were intensifying local inflammatory process, and contributing to clinical aspects such as increased marginal bleeding and probing depth found in patients with peri-implantitis. Furthermore, as IL-17 and IL-33 were increased in patients with peri-implant mucositis, hypothesized that these cytokines were also contributing to the inflammatory process observed in this disease.   Copyright © 2016 Elsevier Ltd. All rights reserved.

Prognostic indicators for surgical peri-implantitis treatment.

Author(s): de Waal, Yvonne C M; Raghoebar, Gerry M; Meijer, Henny J A; Winkel, Edwin G; van Winkelhoff, Arie Jan

Abstract: Objective of this study was to identify prognostic indicators for the outcome of resective peri-implantitis treatment, by an analysis of the pooled data of two previously conducted randomized controlled trials.   Data of 74 patients with peri-implantitis (187 implants) who had received resective surgical treatment were available. Primary outcome variable was failure of peri-implantitis treatment after 12 months. Multilevel univariable and multiple logistic regression analyses were performed to evaluate the effect of various potentially prognostic indicators on the primary outcome. Peri-implantitis treatment was unsuccessful in 106 implants (57%) and 48 patients (67%) after 12 months. In the multiple regression analysis, the variables "order of inclusion" (P = 0.016) and mean bone loss at baseline (P = 0.030) were significant prognostic indicators for treatment failure. To eliminate the effect of "order of inclusion," post hoc analyses were carried out in a subgroup of patients. The univariable post hoc analysis showed a significant association for smoking (P = 0.015), maximum pocket depth at baseline (P = 0.073), mean bone loss at baseline (P = 0.003), and presence of plaque (P = 0.100). In the multiple regression post hoc analysis, only the variables smoking (P = 0.044) and mean bone loss (P = 0.043) remained statistically significant. The outcome of surgical peri-implantitis treatment is influenced by the experience of the surgical team with the surgical procedure. The observed learning effect has consequences for clinical practice and for conducting and interpreting clinical trials on peri-implantitis treatment. Other prognostic indicators are amount of peri-implant bone loss at baseline and smoking, and to a lesser extent, probing pocket depth at baseline and presence of plaque during follow-up. Early diagnosis of peri-implantitis and control of behavioral factors are crucial in achieving peri-implantitis treatment success. © 2015 John Wiley & Sons A/S. Published by John Wiley & Sons Ltd.

Bisphosphonate-related osteonecrosis of the jaw

Bisphosphonate-related osteonecrosis of the jaw in metastatic breast cancer patients: a review of 25 cases.

Author(s): Kim, Hong-Joon; Park, Tae-Jun; Ahn, Kang-Min

Source: Maxillofacial plastic and reconstructive surgery; Dec 2016; vol. 38 (no. 1); p. 6

Abstract: Intravenous bisphosphonates have been used in metastatic breast cancer patients to reduce pathologic bone fracture and bone pain. However, necrosis of the jaw has been reported in those who received intravenous bisphosphonates. Bisphosphonate-related osteonecrosis of the jaw (BRONJ) is caused by dental extraction, dental implant surgery, and denture wearing; however, it occurs spontaneously. The purpose of this study was to report BRONJ in metastatic breast cancer patients. Consecutive 25 female patients were referred from the Department of Oncology from 2008 to 2014 for jaw bone discomfort. Staging of breast cancer, history of bisphosphonate infusion, etiology of BRONJ, and treatment results were reviewed. Average age of the patients was 55.4 years old (38-74). Twelve maxillae and 16 mandibles were involved. Conservative treatments such as irrigation, antibiotic medication, analgesics, and oral gargle were applied for all patients for the initial treatment. Patients who had sequestrum underwent debridement and primary closure. The etiologies of BRONJ were dental extraction (19 cases), dental implant (2 cases), and endodontic treatment (1 case). However, three patients did not have any risk factors to cause BRONJ. Three patients died of progression of metastasis during follow-up periods. Surgical debridement was performed in 21 patients with success in 18 patients. Three patients showed recurred bone exposure and infection after operation. Prevention of the BRONJ is critical in metastatic breast cancer patients. Conservative treatment to reduce pain, discomfort, and infection is recommended for the initial therapy. However, if there is a sequestrum, surgical debridement and primary closure is the key to treat the BRONJ.

Photodynamically dealing with bisphosphonate-related osteonecrosis of the jaw: Successful case reports

Author(s): de Castro M.S.; Ribeiro N.V.; de Carli M.L.; Hanemann J.A.C.; Pereira A.A.C.; Sperandio F.F.

Source: Photodiagnosis and Photodynamic Therapy; Dec 2016; vol. 16 ; p. 72-75

Efficacy of the C-terminal telopeptide test in predicting the development of bisphosphonate-related osteonecrosis of the jaw: a systematic review.

Author(s): Dal Prá, K J; Lemos, C A A; Okamoto, R; Soubhia, A M P; Pellizzer, E P

Source: International journal of oral and maxillofacial surgery; Nov 2016

Abstract: This systematic review evaluated the efficacy of the morning fasting serum C-terminal telopeptide (CTX) test in predicting the development of bisphosphonate-related osteonecrosis of the jaw (BRONJ). A comprehensive search of studies published up to March 2016, and listed in the PubMed/MEDLINE, Web of Science, and Cochrane Library databases, was performed in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. This review has been registered in the PROSPERO international prospective register of systematic reviews (CRD42016036717). The search identified 542 publications; eight studies were finally deemed eligible for inclusion according to the study criteria. These studies included a total 1442 patients (mean age 66.7 years). The most prescribed drug was alendronate, with osteoporosis being the most frequent indication for the prescription of bisphosphonates. Tooth extraction was the most common trigger for BRONJ. Of all patients evaluated after bisphosphonate treatment, only 24 (1.7%) developed BRONJ. All eight of the selected studies found that CTX levels were not predictive of the development of BRONJ. In conclusion, this systematic review indicates that the CTX test has no predictive value in determining the risk of osteonecrosis in patients taking bisphosphonates.

Dental-related cleft lip and palate

Alveolar bone grafting with simultaneous cleft lip rhinoplasty.

Author(s): Kim, Young-Eun; Han, Jihyeon; Baek, Rong-Min; Kim, Baek-Kyu

Source: Journal of plastic, reconstructive & aesthetic surgery : JPRAS; Nov 2016; vol. 69 (no. 11); p. 1544-1550

Abstract: Optimal timing for cleft lip rhinoplasty is controversial. Definitive rhinoplasty is deferred until facial skeletal growth is completed. Intermediate rhinoplasty is performed after stabilization of the grafted alveolar bone, because the grafted bone tends to be absorbed over several months postoperatively, distorting the nasal profile. Here, we report our experience with simultaneous rhinoplasty during alveolar bone grafting for indicated patients, describe our surgical technique that ensures long-term bone graft survival, and report graft take rates and nasal profile changes.   This retrospective chart review included a total of 54 patients; 44 underwent alveolar bone grafting only, and 10 underwent simultaneous cleft lip rhinoplasty. All surgeries were conducted with a judicious mucosal incision for tensionless wound closure. Bone graft take was evaluated with dental radiographs by the Bergland classification. Further, nasal aesthetic outcome was evaluated with medical photographs, based on nostril height and width and alar base width. In total, 96.3% of clefts showed graft success with Type I (66.7%) or Type II (27.8%) classifications; only 3.7% of clefts showed unfavorable results classified as Type III, and no clefts showed Type IV failure. The nasal shape was flatter with a decreased nostril height and increased nostril width after alveolar bone grafting, while nostril height was increased and nostril width was decreased in patients who underwent simultaneous rhinoplasty.   With surgical techniques ensuring alveolar bone graft survival, simultaneous cleft lip rhinoplasty can result in nasal aesthetic improvement for patients with severe nasal deformities, decreasing the number of operations. Copyright © 2016 British Association of Plastic, Reconstructive and Aesthetic Surgeons. Published by Elsevier Ltd. All rights reserved.

An Intercenter Comparison of Dental Arch Relationships and Craniofacial Form Including a Center Using Nasoalveolar Molding.

Author(s): Peanchitlertkajorn, Supakit; Mercado, Ana; Daskalogiannakis, John; Hathaway, Ronald; Russell, Kathleen; Semb, Gunvor; Shaw, William; Lamichane, Manish; Fessler, Jennifer; Long, Ross E

Source: The Cleft palate-craniofacial journal : official publication of the American Cleft Palate-Craniofacial Association; Nov 2016

Abstract: To compare dental arch relationship and craniofacial morphology of patients with CUCLP in pre-adolescence from five cleft centers including a center using NAM.   Retrospective cohort study.   Five cleft centers in North America.   One hundred eighty-two subjects with repaired CUCLP from the five cleft centers participated in the craniofacial form study. One hundred forty-eight subjects from four of the five centers participated in the dental arch relationship study. Digital dental models were assessed using the GOSLON Yardstick. Eighteen cephalometric measurements were performed. Measurement means, by center, were compared. Analysis of variance and Tukey-Kramer analysis were used to compare GOSLON scores and cephalometric measurements.   The center that performed neither PSOT (including NAM) nor primary bone grafting exhibited the most favorable mean GOSLON score. The same center also showed the

highest mean SNA, ANB, and ANS-N-Pg angles. However, the mean ANB and ANS-N-Pg angles were not significantly different from those of the center using NAM. No statistically significant differences were seen for mandibular prominence, vertical dimensions, or dental inclinations. The center with NAM also showed a significantly smaller nasoform angle than two of the four other centers.   The centers that used NAM and other forms of PSOT did not have better dental arch relationships or craniofacial morphology compared with the centers that performed only primary lip repair. However, this study was not designed to investigate the cause-and-effect relationship between specific outcomes and particular features of those protocols.

Assessment of Periodontal and Hygiene Conditions of Removable Partial Dentures in Individuals With Clefts.

Author(s): de Almeida, Ana Lúcia Pompéia Fraga; Catalani, Danilo Tomazzini; Garcia de Oliveira, Pedro César; Soares, Simone; Tunes, Fábio Sanches Magalhães; Neppelenbroek, Karin Hermana

Source: The Cleft palate-craniofacial journal : official publication of the American Cleft Palate-Craniofacial Association; Nov 2016; vol. 53 (no. 6); p. 727-731

Abstract: To assess hygiene conditions in removable partial dentures (RPDs) and to compare the periodontal status between abutment and nonabutment teeth in clefts patients.   Cross-sectional.   Tertiary referral hospital.   Forty-five patients of both genders, aged 20 to 75 years, who were upper RPD wearers for at least 2 years, with cleft lip, alveolus, and/or palate who attended follow-up appointments between 2010 and 2012.   The clinical periodontal parameters assessed on abutment teeth (experimental group) and nonabutment teeth (control group) were probing depth, clinical attachment level (CAL), plaque index, and gingival index (GI). The RPDs were evaluated under the following parameters: hygiene conditions and type of clasp on abutment. Both groups were analyzed using Mann-Whitney, Kruskal-Wallis, and Dunn's statistical test. Statistical significance was set at $P < .05$.   One hundred sixty-six abutment teeth and 168 nonabutment teeth were evaluated in 45 patients. A statistically significant difference was found between the groups for the CAL parameter ($P = .03$). With regard to the prostheses' hygiene conditions through the Tarbet index parameter, of the 186 quadrants evaluated, 143 scored 2 and 3. Ackers' clasps were the most frequent clasps (n = 111). A statistically significant difference was found for the GI parameter ($P = .03$).   It was possible to conclude, in this cross-sectional study, that in general terms, the use of RPDs did not interfere in the periodontal conditions of abutment teeth; however, most prostheses presented poor hygiene and high quantity of dental plaque.

Cephalometric Outcomes of Maxillary Expansion and Protraction in Patients With Unilateral Cleft Lip and Palate After Two Types of Palatoplasty.

Author(s): Tome, Wakako; Yashiro, Kohtaro; Kogo, Mikihiko; Yamashiro, Takashi

Source: The Cleft palate-craniofacial journal : official publication of the American Cleft Palate-Craniofacial Association; Nov 2016; vol. 53 (no. 6); p. 690-694

Abstract: To clarify the differences in the long-term effects of maxillary expansion (ME) and protraction (MP) in patients with complete unilateral cleft lip, alveolus, and palate (UCLP) undergoing two types of palatoplasty.   Retrospective longitudinal study.   Institutional study.   Thirty-eight patients with UCLP treated at Osaka University Dental Hospital, Japan, were divided into two groups: 19 patients were treated using Wardill-Kilner push-back palatoplasty (PB), and 19 patients were treated with early two-stage palatoplasty according to the modified Furlow technique (ETS). All patients exhibited a short maxilla at the initial orthodontic visit and were treated with ME using a quad helix appliance and MP with a face mask. Lateral cephalometric data recorded in the initial stage were compared with those obtained at the end of treatment.   The dentoskeletal features and facial soft tissue profile were evaluated before and after orthodontic treatment. The

variation and rate of change during treatment were also calculated. The Mann-Whitney U test was used for the statistical analyses.   The ETS group showed significantly greater SNA, SNB, and U1-Pp angles and smaller SN-Mp angles than the PB group after face mask treatment. The variation in the anteroposterior length of the maxilla during treatment was significantly greater in the ETS group than in the PB group.   Maxillary protraction was more efficiently accomplished in the patients with UCLP after early two-stage palatoplasty compared with push-back palatoplasty.

Cleft Lip Repair, Nasoalveolar Molding, and Primary Cleft Rhinoplasty

Author(s): Bhuskute A.A.; Tollefson T.T.

Source: Facial Plastic Surgery Clinics of North America; Nov 2016; vol. 24 (no. 4); p. 453-466

Abstract: Cleft lip and palate are the fourth most common congenital birth defect. Management requires multidisciplinary care owing to the complexity of these clefts on midface growth, dentition, Eustachian tube function, and lip and nasal cosmesis. Repair requires planning, but can be performed systematically to reduce variability of outcomes. The use of primary rhinoplasty at the time of cleft lip repair can improve nose symmetry and reduce nasal deformity. Use of nasoalveolar molding ranging from lip taping to the use of preoperative infant orthopedics has played an important role in improving functional and cosmetic results of cleft lip repair. Copyright © 2016 Elsevier Inc.

Cone-beam computed tomography-synthesized cephalometric study of operated unilateral cleft lip and palate and noncleft children with Class III skeletal relationship.

Author(s): Lin, Yifan; Fu, Zhen; Ma, Lian; Li, Weiran

Source: American journal of orthodontics and dentofacial orthopedics : official publication of the American Association of Orthodontists, its constituent societies, and the American Board of Orthodontics; Nov 2016; vol. 150 (no. 5); p. 802-810

Abstract: Our objective was to compare the craniofacial hard and soft tissue characteristics between children with operated unilateral cleft lip and palate (UCLP) and children with noncleft lip and palate (non-CLP) with a Class III skeletal relationship.   The study sample consisted of 30 subjects (18 boys, 12 girls; mean age, 10.21 years) affected by UCLP and 30 non-CLP subjects (17 boys, 13 girls; mean age, 10.19 years) as the control group. All subjects were in the mixed dentition with a Class III skeletal relationship. Cone-beam computed tomography-synthesized cephalograms were traced and evaluated, and craniofacial hard and soft tissue morphologies were compared between the UCLP and non-CLP groups. Maxillary length and gonial angle were 2.66 mm shorter and 3.67° greater, respectively, in the UCLP group than those in the non-CLP group. The SNA and SNB angles describing the sagittal positions of the maxilla and mandible, respectively, relative to the cranial base were significantly smaller in the UCLP group (P <0.001 and P = 0.003, respectively). However, the 2 groups had similar sagittal intermaxillary relationships with similar ANB angles (P = 0.669). In the vertical dimension, the mandibular plane angle and the growth direction vector were significantly greater in the UCLP group (P = 0.007 and P <0.001, respectively). Lastly, the UCLP group had a more concave soft tissue profile, manifested by a reduced facial convexity angle, as well as an acute nasolabial angle and a more protruded lower lip.   Although the 2 groups had similar sagittal intermaxillary relationships, patients in the UCLP group had more retrusive maxillary and mandibular positions relative to the cranial base and more severe vertical discrepancies. Additionally, the soft tissue profiles of patients affected by UCLP were more concave, and the compensatory adaptation was less satisfactory. Copyright © 2016 American Association of Orthodontists. Published by Elsevier Inc. All rights reserved.

GAND classification and volumetric assessment of unilateral cleft lip and palate malformations using cone beam computed tomography

Author(s): Barbosa G.L.D.; Emodi O.; Pretti H.; van Aalst J.A.; de Almeida S.M.; Tyndall D.A.; Pimenta L.A.

Source: International Journal of Oral and Maxillofacial Surgery; Nov 2016; vol. 45 (no. 11); p. 1333-1340

Abstract: The aim of this study was to propose a classification for unilateral cleft lip and palate (UCLP) malformations based on cone beam computed tomography (CBCT) images, as well as to estimate the amount of bone necessary for grafting, and to evaluate the relationship of this volume with scores obtained using the classification. CBCT images of 33 subjects with UCLP were evaluated according to gap, arch, nasal, and dental parameters (GAND classification). Additionally, these defects were segmented and the amount of graft needed for alveolar bone grafting was estimated. The reproducibility of GAND classification was analyzed by weighted kappa test. The association of volume assessment with the classification (gap and nasal parameters) was verified using analysis of variance, while the intra-observer agreement was analyzed using the intra-class correlation coefficient. The intra-observer reproducibility of the classification ranged from 0.29 to 0.92 and the inter-observer agreement ranged from 0.29 to 0.91. There were no statistically significant values when evaluating the association of the volume with the classification (P > 0.05). The GAND classification is a novel system that allows the quick estimation of the extent and complexity of the cleft. It is not possible to estimate the amount of bone needed for alveolar bone grafting based on the classification; individualized surgical planning should be done for each patient specifically. Copyright © 2016 International Association of Oral and Maxillofacial Surgeons

Novel IRF6 Mutations Detected in Orofacial Cleft Patients by Targeted Massively Parallel Sequencing.

Author(s): Khandelwal, K D; Ishorst, N; Zhou, H; Ludwig, K U; Venselaar, H; Gilissen, C; Thonissen, M; van Rooij, I A L M; Dreesen, K; Steehouwer, M; van de Vorst, M; Bloemen, M; van Beusekom, E; Roosenboom, J; Borstlap, W; Admiraal, R; Dormaar, T; Schoenaers, J; Vander Poorten, V; Hens, G; Verdonck, A; Bergé, S; Roeleveldt, N; Vriend, G; Devriendt, K; Brunner, H G; Mangold, E; Hoischen, A; van Bokhoven, H; Carels, C E L

Source: Journal of dental research; Nov 2016

Abstract: Common variants in interferon regulatory factor 6 (IRF6) have been associated with nonsyndromic cleft lip with or without cleft palate (NSCL/P) as well as with tooth agenesis (TA). These variants contribute a small risk towards the 2 congenital conditions and explain only a small percentage of heritability. On the other hand, many IRF6 mutations are known to be a monogenic cause of disease for syndromic orofacial clefting (OFC). We hypothesize that IRF6 mutations in some rare instances could also cause nonsyndromic OFC. To find novel rare variants in IRF6 responsible for nonsyndromic OFC and TA, we performed targeted multiplex sequencing using molecular inversion probes (MIPs) in 1,072 OFC patients, 67 TA patients, and 706 controls. We identified 3 potentially pathogenic de novo mutations in OFC patients. In addition, 3 rare missense variants were identified, for which pathogenicity could not unequivocally be shown, as all variants were either inherited from an unaffected parent or the parental DNA was not available. Retrospective investigation of the patients with these variants revealed the presence of lip pits in one of the patients with a de novo mutation suggesting a Van der Woude syndrome (VWS) phenotype, whereas, in other patients, no lip pits were identified.   © International & American Associations for Dental Research 2016.

Database: Medline

Palatal growth in complete unilateral cleft lip and palate patients following neonatal cheiloplasty: Classic and geometric morphometric assessment

Author(s): Hoffmannova E.; Bejdova S.; Dupej J.; Caganova V.; Veleminska J.; Borsky J.

Source: International Journal of Pediatric Otorhinolaryngology; Nov 2016; vol. 90 ; p. 71-76

Abstract: Background A new method of early neonatal cheiloplasty has recently been employed on patients having complete unilateral cleft lip and palate (cUCLP). We aimed to investigate (1) their detailed palatal morphology before surgery and growth during the 10 months after neonatal cheiloplasty, (2) the growth of eight dimensions of the maxilla in these patients, (3) the development of these dimensions compared with published data on noncleft controls and on cUCLP patients operated using later operation protocol (LOP; 6 months of age). Methods Sixty-six virtual dental models of 33 longitudinally evaluated cUCLP patients were analysed using metric analysis, a dense correspondence model, and multivariate statistics. We compared the palatal surfaces before neonatal cheiloplasty (mean age, 4 days) and before palatoplasty (mean age, 10 months). Results The palatal form variability of 10-month-old children was considerably reduced during the observed period thanks to their undisturbed growth, that is, the palate underwent the same growth changes following neonatal cheiloplasty. A detailed colour-coded map identified the most marked growth at the anterior and posterior ends of both segments. The maxilla of cUCLP patients after neonatal cheiloplasty had a growth tendency similar to noncleft controls (unlike LOP). Conclusions Both methodological approaches showed that early neonatal cheiloplasty in cUCLP patients did not prevent forward growth of the upper jaw segments and did not reduce either the length or width of the maxilla during the first 10 months of life. Copyright © 2016 Elsevier Ireland Ltd

Pattern of clefts and dental anomalies in six-year-old children: a retrospective observational study in western Norway.

Author(s): Sæle, Paul; Østhus, Eirik; Ådalen, Sondre; Nasir, Elwalid F; Mustafa, Manal

Source: Acta odontologica Scandinavica; Nov 2016 ; p. 1-6

Abstract: Clefts of the lip and/or palate (CL/P) are the most common congenital disorders of the head and neck. In Norway, the incidence is 1.9/1000 live births. The aim of this study was to investigate the frequency and distribution of various types of clefts and dental anomalies in patients treated by the cleft lip and palate (CLP) team in Bergen, Norway.   The material comprised the records of patients 6 years of age, examined by the CLP team in Bergen from spring 1993 to autumn 2012, incomplete records were excluded. The records of 989 patients were analysed, using frequencies and Chi-square test to compare differences in percentages between groups. The gender distribution was 58.8% male and 41.2% female. Isolated cleft palate (CP) was the most common condition (39.5%). Clefts of the lip, jaw and palate (CLP) constituted (30%) of cases and (30.5%) had isolated cleft lip (CL). The frequencies of agenesis, supernumerary and peg-shaped teeth were (36.5%), (17.8%) and (7.5%), respectively. Over 50% of the study population were diagnosed with one or more malocclusion. Of the CLP patients, 61.4% had Angle Class III occlusion. Statistical analysis disclosed a positive association of agenesis with Class III occlusion (OR =1.8, p≤ 0.001).   The findings supported the hypothesis that the distribution of dental anomalies and occlusal disorders varied among patients with CL, CP and CLP. In patients with cleft, there is a twofold chance to get Class III malocclusion in the presence of agenesis.

Second premolar agenesis as a subclinical phenotype of isolated cleft palate.

Author(s): Schwartz, J P; Lauris, R C M C; Dalbén, G; Garib, D G

Source: Orthodontics & craniofacial research; Nov 2016

Abstract: To compare the prevalence of dental anomalies in patients with isolated cleft palate with or without hypodontia of the second premolar.	A total of 653 patients with isolated cleft palate aged 8-12 years were divided into two groups: G1-subjects without hypodontia of second premolar (n = 546) and G2-subjects with hypodontia of at least one-second premolar (n = 107). The control group consisted of 107 non-cleft orthodontic patients. Panoramic and periapical radiographs and dental casts were used to analyze the presence of dental anomalies. Intergroup comparisons were performed using the chi-square test complemented by Proportion test and Bonferroni test.	G2 presented higher prevalence of hypodontia of other permanent teeth compared to G1 and control. Ectopic eruption of the maxillary canine and tooth transposition were more frequent in patients with a cleft compared to patients without a cleft, without statistical differences. Deciduous molar infra-occlusion and second premolar disto-angulation were less prevalent in G1 and G2 compared to the control group. G2 showed a higher prevalence of complete cleft palate than G1. Patients with cleft palate and second premolar agenesis showed increased prevalence of tooth agenesis and palatally displaced canines.	© 2016 John Wiley & Sons A/S. Published by John Wiley & Sons Ltd.

Stress and displacement pattern evaluation using two different palatal expanders in unilateral cleft lip and palate: a three-dimensional finite element analysis.

Author(s): Mathew, Anoop; Nagachandran, K S; Vijayalakshmi, Devaki

Source: Progress in orthodontics; Dec 2016; vol. 17 (no. 1); p. 38

Abstract: In this finite element (FE) study, the stress distribution and displacement pattern was evaluated in the mid-palatal area and around circum-maxillary sutures exerted by bone-borne palatal expander (BBPE) in comparison with conventional HYRAX rapid palatal expander in unilateral cleft lip and palate.	Computed tomography scan images of a patient with unilateral cleft palate was used to create a FE model of the maxillary bone along with circum-maxillary sutures. A three-dimensional model of the conventional HYRAX (Hygienic Rapid Expander) expander and custom-made BBPE was created by laser scanning and programmed into the FE model. With the BBPE, the maximum stress was observed at the implant insertion site, whereas with the conventional HYRAX expander, it was at the dentition level. Among the circum-maxillary sutures, the zygomaticomaxillary suture experienced maximum stress followed by the zygomaticotemporal and nasomaxillary sutures. Displacement in the X-axis (transverse) was highest on the cleft side, and in the Y-axis (antero-posterior), it was highest in the posterior region in the BBPE.	The total displacement was observed maximum in the mid-palatal cleft area in the BBPE, and it produced true skeletal expansion at the alveolar level without any dental tipping when compared with the conventional HYRAX expander.

Periodontal disease and antibiotics

Microbial signatures of oral dysbiosis, periodontitis and edentulism revealed by Gene Meter methodology

Author(s): Hunter M.C.; Pozhitkov A.E.; Noble P.A.

Source: Journal of Microbiological Methods; Dec 2016; vol. 131 ; p. 85-101

Publication Date: Dec 2016

Abstract: Conceptual models suggest that certain microorganisms (e.g., the "red" complex) are indicative of a specific disease state (e.g., periodontitis); however, recent studies have questioned the validity of these models. Here, the abundances of 500 + microbial species were determined in 16 patients with clinical signs of one of the following oral conditions: periodontitis, established caries,

edentulism, and oral health. Our goal was to determine if the abundances of certain microorganisms reflect dysbiosis or a specific clinical condition that could be used as a 'signature' for dental research. Microbial abundances were determined by the analysis of 138,718 calibrated probes using Gene Meter methodology. Each 16S rRNA gene was targeted by an average of 194 unique probes (n = 25 nt). The calibration involved diluting pooled gene target samples, hybridizing each dilution to a DNA microarray, and fitting the probe intensities to adsorption models. The fit of the model to the experimental data was used to assess individual and aggregate probe behavior; good fits (R2> 0.90) were retained for back-calculating microbial abundances from patient samples. The abundance of a gene was determined from the median of all calibrated individual probes or from the calibrated abundance of all aggregated probes. With the exception of genes with low abundances (< 2 arbitrary units), the abundances determined by the different calibrations were highly correlated (r ~ 1.0). Seventeen genera were classified as 'signatures of dysbiosis' because they had significantly higher abundances in patients with periodontitis and edentulism when contrasted with health. Similarly, 13 genera were classified as 'signatures of periodontitis', and 14 genera were classified as 'signatures of edentulism'. The signatures could be used, individually or in combination, to assess the clinical status of a patient (e.g., evaluating treatments such as antibiotic therapies). Comparisons of the same patient samples revealed high false negatives (45%) for next-generation-sequencing results and low false positives (7%) for Gene Meter results. Copyright © 2016 Elsevier B.V.

Efficacy of scaling and root planing with and without adjunct antimicrobial photodynamic therapy on the expression of cytokines in the gingival crevicular fluid of patients with periodontitis: A systematic review

Author(s): Kellesarian S.V.; Malmstrom H.; Javed F.; Malignaggi V.R.; Abduljabbar T.; Vohra F.; Romanos G.E.

Source: Photodiagnosis and Photodynamic Therapy; Dec 2016; vol. 16 ; p. 76-84

Abstract: Background The aim of the present review was to study the efficacy of scaling and root planing (SRP) with and without adjunct antibacterial photodynamic therapy (aPDT) on the expression of cytokines in the gingival crevicular fluid (GCF) of patients with periodontitis. Methods In order to address the focused question: "What is the efficacy of SRP with and without aPDT on the expression of cytokines in the GCF of patients with periodontitis" an electronic search without time or language restrictions was conducted up to and including July 2016 in indexed databases using various key words. The exclusion criteria included reviews, laboratory and experimental studies, case reports, commentaries, letters to the editor, interviews, updates, studies where intervention group received aPDT without previous SRP, and studies where local delivery of antibiotics was used as adjunctive therapy to aPDT. Results Six randomized control trials were included in the present systematic review. All studies included a control group which received only SRP. Results from 34% of studies reported lower cytokine levels among individuals receiving adjunct aPDT to SPT compared to patients receiving SRP alone. Selective cytokines reduction in the GCF following SRP with adjunct aPDT compared with SRP alone was reported in 50% of the studies. In one study SRP with adjunct aPDT failed to reduce GCF cytokine concentration. Conclusion From the literature reviewed the efficacy aPDT as adjunct to SRP in downregulating GCF cytokines remains debatable. Further well-designed studies are needed in this regard. Copyright © 2016 Elsevier B.V.

Efficacy of scaling and root planing with and without adjunct antimicrobial photodynamic therapy on the expression of cytokines in the gingival crevicular fluid of patients with periodontitis: A systematic review.

Author(s): Kellesarian, Sergio Varela; Malignaggi, Vanessa Ros; Abduljabbar, Tariq; Vohra, Fahim; Malmstrom, Hans; Romanos, Georgios E; Javed, Fawad

Abstract: The aim of the present review was to study the efficacy of scaling and root planing (SRP) with and without adjunct antibacterial photodynamic therapy (aPDT) on the expression of cytokines in the gingival crevicular fluid (GCF) of patients with periodontitis.　　In order to address the focused question: "What is the efficacy of SRP with and without aPDT on the expression of cytokines in the GCF of patients with periodontitis" an electronic search without time or language restrictions was conducted up to and including July 2016 in indexed databases using various key words. The exclusion criteria included reviews, laboratory and experimental studies, case reports, commentaries, letters to the editor, interviews, updates, studies where intervention group received aPDT without previous SRP, and studies where local delivery of antibiotics was used as adjunctive therapy to aPDT. Six randomized control trials were included in the present systematic review. All studies included a control group which received only SRP. Results from 34% of studies reported lower cytokine levels among individuals receiving adjunct aPDT to SPT compared to patients receiving SRP alone. Selective cytokines reduction in the GCF following SRP with adjunct aPDT compared with SRP alone was reported in 50% of the studies. In one study SRP with adjunct aPDT failed to reduce GCF cytokine concentration.　　From the literature reviewed the efficacy aPDT as adjunct to SRP in downregulating GCF cytokines remains debatable. Further well-designed studies are needed in this regard. Copyright Â© 2016 Elsevier B.V. All rights reserved.

Microbial signatures of oral dysbiosis, periodontitis and edentulism revealed by Gene Meter methodology.

Author(s): Hunter, M Colby; Pozhitkov, Alex E; Noble, Peter A

Abstract: Conceptual models suggest that certain microorganisms (e.g., the "red" complex) are indicative of a specific disease state (e.g., periodontitis); however, recent studies have questioned the validity of these models. Here, the abundances of 500+ microbial species were determined in 16 patients with clinical signs of one of the following oral conditions: periodontitis, established caries, edentulism, and oral health. Our goal was to determine if the abundances of certain microorganisms reflect dysbiosis or a specific clinical condition that could be used as a 'signature' for dental research. Microbial abundances were determined by the analysis of 138,718 calibrated probes using Gene Meter methodology. Each 16S rRNA gene was targeted by an average of 194 unique probes (n=25nt). The calibration involved diluting pooled gene target samples, hybridizing each dilution to a DNA microarray, and fitting the probe intensities to adsorption models. The fit of the model to the experimental data was used to assess individual and aggregate probe behavior; good fits (R(2)>0.90) were retained for back-calculating microbial abundances from patient samples. The abundance of a gene was determined from the median of all calibrated individual probes or from the calibrated abundance of all aggregated probes. With the exception of genes with low abundances (<2 arbitrary units), the abundances determined by the different calibrations were highly correlated (r~1.0). Seventeen genera were classified as 'signatures of dysbiosis' because they had significantly higher abundances in patients with periodontitis and edentulism when contrasted with health. Similarly, 13 genera were classified as 'signatures of periodontitis', and 14 genera were classified as 'signatures of edentulism'. The signatures could be used, individually or in combination, to assess the clinical status of a patient (e.g., evaluating treatments such as antibiotic therapies). Comparisons of the same patient samples revealed high false negatives (45%) for next-generation-sequencing results and low false positives (7%) for Gene Meter results. Copyright Â© 2016 Elsevier B.V. All rights reserved.

Dental-related head and neck oncology

Metal Artifact Reduction in Cone-Beam Computed Tomography for Head and Neck Radiotherapy

Author(s): Korpics M.; Johnson P.; Patel R.; Surucu M.; Choi M.; Emami B.; Roeske J.C.

Abstract: Purpose: To evaluate a method for reducing metal artifacts, arising from dental fillings, on cone-beam computed tomography images. Materials and Methods: A projection interpolation algorithm is applied to cone-beam computed tomography images containing metal artifacts from dental fillings. This technique involves identifying metal regions in individual cone-beam computed tomography projections and interpolating the surrounding values to remove the metal from the projection data. Axial cone-beam computed tomography images are then reconstructed, resulting in a reduction in the streak artifacts produced by the metal. Both phantom and patient imaging data are used to evaluate this technique. Results: The interpolation substitution technique successfully reduced metal artifacts in all cases. Corrected images had fewer or no streak artifacts compared to their noncorrected counterparts. Quantitatively, regions of interest containing the artifacts showed reduced variance in the corrected images versus the uncorrected images. Average pixel values in regions of interest around the metal object were also closer in value to nonmetal regions after artifact reduction. Artifact correction tended to perform better on patient images with less complex metal objects versus those with multiple large dental fillings. Conclusion: The interpolation substitution is potentially an efficient and effective technique for reducing metal artifacts caused by dental fillings on cone-beam computed tomography image. This technique may be effective in reducing such artifacts in patients with head and neck cancer receiving daily image-guided radiotherapy. Copyright © 2015, © The Author(s) 2015.

Metal Artifact Reduction in Cone-Beam Computed Tomography for Head and Neck Radiotherapy.

Author(s): Korpics, Mark; Johnson, Paul; Patel, Rakesh; Surucu, Murat; Choi, Mehee; Emami, Bahman; Roeske, John C

Abstract: To evaluate a method for reducing metal artifacts, arising from dental fillings, on cone-beam computed tomography images. A projection interpolation algorithm is applied to cone-beam computed tomography images containing metal artifacts from dental fillings. This technique involves identifying metal regions in individual cone-beam computed tomography projections and interpolating the surrounding values to remove the metal from the projection data. Axial cone-beam computed tomography images are then reconstructed, resulting in a reduction in the streak artifacts produced by the metal. Both phantom and patient imaging data are used to evaluate this technique. The interpolation substitution technique successfully reduced metal artifacts in all cases. Corrected images had fewer or no streak artifacts compared to their noncorrected counterparts. Quantitatively, regions of interest containing the artifacts showed reduced variance in the corrected images versus the uncorrected images. Average pixel values in regions of interest around the metal object were also closer in value to nonmetal regions after artifact reduction. Artifact correction tended to perform better on patient images with less complex metal objects versus those with multiple large dental fillings. The interpolation substitution is potentially an efficient and effective technique for reducing metal artifacts caused by dental fillings on cone-beam computed tomography image. This technique may be effective in reducing such artifacts in patients with head and neck cancer receiving daily image-guided radiotherapy. © The Author(s) 2015.

Mandibular Reconstruction: Overview.

Author(s): Kumar, Batchu Pavan; Venkatesh, V; Kumar, K A Jeevan; Yadav, B Yashwanth; Mohan, S Ram

Abstract: Mandibular reconstruction has changed significantly over the years and continues to evolve with the introduction of newer technologies and techniques.   This article reviews the history of oromandibular reconstruction, biomechanics of mandible, summarizes the reconstruction options available for mandible with defect classification, goals in reconstruction, the various donor sites, current reconstructive options, dental rehabilitation and persistent associated problems. Oromandibular reconstruction, although a challenge for the head and neck reconstructive surgeon, is now reliable and highly successful with excellent long-term functional and aesthetic outcomes with the use of autogenous bone grafts and current reconstructive options. The ideal reconstruction would provide a solid arch to articulate with the upper jaw, restoring swallowing speech, mastication, and esthetics. Autogenous vascularized bone grafts in combination with microsurgical techniques have revolutionized mandibular reconstruction in oral cancer surgery. Current trends in mandibular reconstruction aim to achieve reestablishment of a viable mandible of proper form and maxillary mandibular relationship while decreasing the need for invasive autogenous graft procurement. However the optimal reconstruction of mandibular defects is still controversial in regards to reconstructive options which include the donor site selection, timing of surgery and method of reconstruction.

Observer Evaluation of a Metal Artifact Reduction Algorithm Applied to Head and Neck Cone Beam Computed Tomographic Images

Author(s): Korpics M.; Surucu M.; Mescioglu I.; Alite F.; Block A.M.; Choi M.; Emami B.; Harkenrider M.M.; Solanki A.A.; Roeske J.C.

Abstract: Purpose and Objectives To quantify, through an observer study, the reduction in metal artifacts on cone beam computed tomographic (CBCT) images using a projection-interpolation algorithm, on images containing metal artifacts from dental fillings and implants in patients treated for head and neck (H&N) cancer. Methods and Materials An interpolation-substitution algorithm was applied to H&N CBCT images containing metal artifacts from dental fillings and implants. Image quality with respect to metal artifacts was evaluated subjectively and objectively. First, 6 independent radiation oncologists were asked to rank randomly sorted blinded images (before and after metal artifact reduction) using a 5-point rating scale (1 = severe artifacts; 5 = no artifacts). Second, the standard deviation of different regions of interest (ROI) within each image was calculated and compared with the mean rating scores. Results The interpolation-substitution technique successfully reduced metal artifacts in 70% of the cases. From a total of 60 images from 15 H&N cancer patients undergoing image guided radiation therapy, the mean rating score on the uncorrected images was 2.3 +/- 1.1, versus 3.3 +/- 1.0 for the corrected images. The mean difference in ranking score between uncorrected and corrected images was 1.0 (95% confidence interval: 0.9-1.2, $P<.05$). The standard deviation of each ROI significantly decreased after artifact reduction ($P<.01$). Moreover, a negative correlation between the mean rating score for each image and the standard deviation of the oral cavity and bilateral cheeks was observed. Conclusion The interpolation-substitution algorithm is efficient and effective for reducing metal artifacts caused by dental fillings and implants on CBCT images, as demonstrated by the statistically significant increase in observer image quality ranking and by the decrease in ROI standard deviation between uncorrected and corrected images. Copyright © 2016 Elsevier Inc.

Dental implants

Dental implants and older patients - Knowing the drill

Author(s): Shanahan D.; O'Neill D.

Source: European Geriatric Medicine; 2016

Irradiated patients and survival rate of dental implants: A systematic review and meta-analysis.

Author(s): Smith Nobrega, Adhara; Jr.Santiago, Joel Ferreira; de Faria Almeida, Daniel Augusto; dos Santos, Daniela Micheline; Pellizzer, Eduardo Piza; Goiato, Marcelo Coelho

Source: Journal of Prosthetic Dentistry; Dec 2016; vol. 116 (no. 6); p. 858-866

A selective laser sintering prototype guide used to fabricate immediate interim fixed complete arch prostheses in flapless dental implant surgery: Technique description and clinical results.

Author(s): Di Giacomo, Giovanni de A.P.; Cury, Patricia R.; da Silva, Airton M.; da Silva, Jorge V.L.; Ajzen, Sergio A.

Source: Journal of Prosthetic Dentistry; Dec 2016; vol. 116 (no. 6); p. 874-879

Survival of dental implants in patients with Down syndrome: A case series.

Author(s): Limeres Posse, Jacobo; López Jiménez, Julian; Ruiz Villandiego, José C.; Cutando Soriano, Antonio; Fernández Feijoo, Javier; Linazasoro Elorza, Maialen; Diniz Freitas, Márcio; Diz Dios, Pedro

Source: Journal of Prosthetic Dentistry; Dec 2016; vol. 116 (no. 6); p. 880-884

How could multimedia information about dental implant surgery effects patients' anxiety level?

Author(s): Kazancioglu, H-O; Dahhan, A-S; Acar, A-H

Source: Medicina oral, patologia oral y cirugia bucal; Dec 2016 ; p. 0

Abstract: To evaluate the effects of different patient education techniques on patients' anxiety levels before and after dental implant surgery.   Sixty patients were randomized into three groups; each contained 20 patients; [group 1, basic information given verbally, with details of operation and recovery; group 2 (study group), basic information given verbally with details of operative procedures and recovery, and by watching a movie on single implant surgery]; and a control group [basic information given verbally "but it was devoid of the details of the operative procedures and recovery"]. Anxiety levels were assessed using the Spielberger's State-Trait Anxiety Inventory (STAI) and Modified Dental Anxiety Scale (MDAS). Pain was assessed with a visual analog scale (VAS). The most significant changes were observed in the movie group ($P < 0.05$). Patients who were more anxious also used more analgesic medication. Linear regression analysis showed that female patients had higher levels of anxiety ($P < 0.05$).   Preoperative multimedia information increases anxiety level.

Dental implant loss in older versus younger patients: a systematic review and meta-analysis of prospective studies.

Author(s): Sendyk, Daniel Isaac; da Silva Rovai, Emanuel; Pannuti, Claudio Mendes; Deboni, Maria Cristina Zindel; Sendyk, Wilson Roberto; Wennerberg, Ann

Source: Journal of oral rehabilitation; Dec 2016

Abstract: The aim of this systematic review was to evaluate implant loss in younger and older patients. An electronic search of four databases (MEDLINE, EMBASE, SCOPUS and the Cochrane Library) was undertaken until May 2016 without time restriction and was supplemented by manual searching. Prospective cohorts were included if they met the following criteria: (1) presence of an

exposed group (older subjects) with a minimum age of 60 years; (2) presence of a control group (younger subjects) with a maximum age of 59 years; and (3) outcome data considering implant survival or loss. Meta-analyses were performed to evaluate the impact of ageing on implant failure. Of 4,152 potentially eligible articles, 4 were included in the qualitative analysis and quantitative synthesis. The pooled estimates suggest that the risk of implant loss in older patients is not significantly higher (RR = 0.92; 95% CI 0.43 - 1.96, p = 0.83) when compared to younger subjects. This systematic review suggests that age is not a limiting factor for dental implant therapy.

Primary Stability of Cylindrical and Conical Dental Implants in Relation to Insertion Torque-A Comparative Ex Vivo Evaluation.

Author(s): Staedt, Henning; Palarie, Victor; Staedt, Arne; Wolf, Jens M; Lehmann, Karl Martin; Ottl, Peter; Kämmerer, Peer W

Abstract: The aim of this ex vivo study was to investigate the influence of different insertion torques on primary stability of a conical and a cylindrical implant system.   Thirty-two dental implants (Astra Tech OsseoSpeed 5.0 S × 11 mm cylindrical [n = 16] and 5.0 × 11 mm conical [n = 16]) were inserted with 20, 30, 40, and 45 N·cm into fresh porcine bone of mixed trabecular-cortical quality. Before insertion, bone quality was assessed via cone beam tomography. After insertion, resonance frequency analysis was reported using the implant stability quotient (ISQ). Implant insertion depths were evaluated, and the implants were pushed out of the bone by force (measured in N). All experiments were done with n = 4 per group. The highest ISQ (mean 78.25 ± 2.9) and pushout values (mean 675 N ± 5.8) were measured for the cylindrical implant after insertion using 30 N·cm. The conical implant showed the highest primary stability by means of ISQ (mean 76.25 ± 2.2) and pushout force (mean 502.5 N ± 9.6) after an insertion torque of 40 N·cm. If more insertion force was used, primary stability was reduced in all cases. The data indicate that different forms of an implant system need different insertion torques to obtain an optimal primary stability. These results have to be verified clinically.

Artifacts in multimodal imaging of titanium, zirconium and binary titanium-zirconium alloy dental implants: an in vitro study.

Author(s): Smeets, Ralf; Schöllchen, Maximilian; Gauer, Tobias; Aarabi, Gahzal; Assaf, Alexandre T; Rendenbach, Carsten; Beck-Broichsitter, Benedicta; Semmusch, Jan; Sedlacik, Jan; Heiland, Max; Fiehler, Jens; Siemonsen, Susanne

Abstract: To analyze and evaluate imaging artifacts induced by zirconium, titanium and titanium-zirconium alloy dental implants. Zirconium, titanium and titanium-zirconium alloy implants were embedded in gelatin and MRI, CT and CBCT were performed. Standard-protocols were used for each modality. For MRI, line-distance-profiles were plotted to quantify the accuracy of size-determination. For CT and CBCT, six shells surrounding the implant were defined every 0.5 cm from the implant's surface and histogram parameters were determined for each shell. While titanium and titanium-zirconium alloy induced extensive signal-voids in MRI due to strong susceptibility, zirconium implants were clearly definable with only minor distortion artifacts. For titanium and titanium-zirconium alloy, the MR signal was attenuated up to 14.1 mm distant from the implant. In CT, titanium and titanium-zirconium alloy resulted in less streak artifacts in comparison to zirconium. In CBCT, titanium-zirconium alloy induced more severe artifacts than zirconium and titanium.   MRI allows for excellent image contrast and limited artifacts in patients with zirconium implants. CT and

CBCT examinations are less affected by artifacts from titanium and titanium-zirconium alloy implants compared to MRI. The knowledge about differences of artifacts through different implant materials and image modalities might help to support clinical decisions for the choice of implant material or imaging device in the clinical setting.

Database: Medline

A selective laser sintering prototype guide used to fabricate immediate interim fixed complete arch prostheses in flapless dental implant surgery: Technique description and clinical results.

Author(s): Di Giacomo, Giovanni de A P; Cury, Patricia R; da Silva, Airton M; da Silva, Jorge V L; Ajzen, Sergio A

Abstract: Extensive occlusal adjustments and misfit of the prosthesis to prosthetic components are frequent problems related to fixed interim prosthesis fabrication with immediate dental implant loading.   The purpose of this clinical trial was to evaluate a prosthetic guide made with a rapid prototype model based on virtual surgical planning. This prosthetic guide was used to fabricate fixed interim prostheses that would allow immediate implant loading after computer-guided implant installation. Nine interim prostheses were made for 9 participants with complete maxillary or mandibular edentulism. The virtual prosthetic guide was planned using computer-assisted design (CAD) software and was fabricated with rapid prototyping equipment (selective laser sintering). The prosthetic guide had 3 portions: the occlusal portion, which had occlusal registration; the connection portion, which had the information of the position and angulation of the abutment/implant projection; and the mucosa portion, which had the registration of the alveolar mucosa architecture. The prosthetic guide was used by a dental technician to fabricate prostheses. A single trained examiner evaluated the passive fit of the interim prostheses, the average time required for installing the interim prosthesis and for occlusal adjustments, the satisfaction of the patient with the prosthesis; and the screws, torque, occlusion, and prosthesis status.   Passive fit was achieved between the prosthetic components and prostheses in 7 participants. The average time required for installing the fixed interim prostheses was 64.44 minutes. All participants reported being more pleased with the fixed interim prosthesis than with the prosthesis worn before implant placement. Prosthesis fractures were observed in 3 participants (2 in the maxilla and 1 in the mandible); all fractures occurred 3 months or more after delivery. No further complication was observed during 6 months of follow-up. The prosthetic guide enabled fabrication of interim immediate prostheses that were easily seated and adjusted to accommodate any shifts in implant position occurring during computer-guided surgery. Immediate implant loading could be achieved in a reasonable operative time. Copyright Â© 2016 Editorial Council for the Journal of Prosthetic Dentistry. Published by Elsevier Inc. All rights reserved.

Airway Management of a Patient with an Acute Floor of the Mouth Hematoma after Dental Implant Surgery in the Lower Jaw.

Author(s): Vehmeijer, Maarten J J B; Verstoep, Naomi; Wolff, Jan E H; Schulten, Engelbert A J M; van den Berg, Bas

Abstract: Over the last decades, dental implants have become increasingly popular in the prosthetic rehabilitation of patients. This has subsequently led to an increase of perioperative complications. Obstruction of the airway as a result of a floor of mouth hematoma after dental implant surgery is a rare but life-threatening complication.   A 62-year-old man presented to the emergency department with a compromised airway caused by a hematoma in the floor of the mouth that occurred during dental implant surgery in the edentulous anterior mandible. Computed tomography

angiography images revealed an elevation of the floor of mouth with subsequent occlusion of the airway. In addition, a perforation of the lingual mandibular cortical plate was observed that was caused by two malpositioned dental implants. Awake fiberoptic intubation was immediately performed, the two malpositioned dental implants were subsequently removed, and the patient was extubated after 3 days. WHY SHOULD AN EMERGENCY PHYSICIAN BE AWARE OF THIS?: Perforation of the lingual mandibular cortical plate during dental implant surgery can lead to life-threatening bleeding in the floor of the mouth. This condition can be successfully treated by awake fiberoptic intubation and, if necessary, the malpositioned dental implants can be subsequently removed.

Dental implants: A review.

Author(s): Guillaume, B

Source: Morphologie : bulletin de l'Association des anatomistes; Dec 2016; vol. 100 (no. 331); p. 189-198

Abstract:A high number of patients have one or more missing tooth and it is estimated that one in four American subjects over the age of 74 have lost all their natural teeth. Many options exist to replace missing teeth but dental implants have become one of the most used biomaterial to replace one (or more) missing tooth over the last decades. Contemporary dental implants made with titanium have been proven safe and effective in large series of patients. This review considers the main historical facts concerned with dental implants and present the different critical factors that will ensure a good osseo-integration that will ensure a stable prosthesis anchorage.   Copyright © 2016 Elsevier Masson SAS. All rights reserved.

Dental implant positioning by using the root way. A predictable technique for postextractive surgery.

Author(s): Norcia, Antonio; Cicciù, Marco; Matacena, Giada; Bramanti, Ennio

Source: Minerva stomatologica; Dec 2016; vol. 65 (no. 6); p. 393-402

Abstract: Postextractive dental implant surgery is a technique characterized by several advantages like placing the implant during the same moment of the extraction, so reducing the time of the surgery and consequently all the prosthetic procedure; however some limitations still remain during this procedure. The disadvantages are represented by the unpredictable results of the healing of the extraction socket, its bone resorption and the dental implant inclination even using a prosthetic guide. Aim of this study is to present a predictable technique for having better aesthetic and functional results during the dental implant positioning.   This study want to presents clinical and radiological case report of dental implant placed following the line of the root before the extraction, in order to share with the clinicians a surgical experience that results to be simple and predictable. The implants placed with this kind of technique showed successful osseointegration after an uneventful healing period of two years. The described technique allows the clinician to achieve the ideal implant positioning during immediate implant placement at multirooted extraction sites.

Titanium dental implant surfaces obtained by anodic spark deposition - From the past to the future.

Author(s): Kaluđerović, Milena R; Schreckenbach, Joachim P; Graf, Hans-Ludwig

Source: Materials science & engineering. C, Materials for biological applications; Dec 2016; vol. 69 ; p. 1429-1441

Abstract: Commercial titanium-based dental implants are obtained applying various methods such as machining, acid etching, anodization, plasma spraying, grit blasting or combination techniques yielding materials with smooth or micro-roughened surfaces. Those techniques are used to optimize the surface properties and to maximize biocompatibility and bioactivity with bone tissue. Present review is focused on the material surfaces obtained by anodic spark deposition (ASD). From the early 1980s till present, the results of numerous studies have shown that anodically oxidized surfaces with different dopants express a positive effect on osteoblasts behavior in vitro and osseointegration in vivo. Those surfaces demonstrated a high biocompatibility and rapid osseointegration in clinical application. This paper provides an overview of the preparation of implant surfaces by employing ASD process. Moreover, reviewed are clinically used ASD implant surfaces (Ticer, TiUnite, Osstem, etc.). The electrolyte variations in ASD process and their influence on surface properties are given herein. Using different electrolytes, anode voltages and temperatures, the above fabrication process can yield various surface morphologies from smooth to rough, porous surfaces. Furthermore, ASD enables thickening of oxide layers and enrichment with different dopands from used electrolyte, which hinder release of potentially toxic titanium ions in surrounding tissue. Particularly exciting results were achieved by calcium and phosphorus doping of the oxide layer (Ticer, ZL Microdent; TiUnite, Nobel Biocare Holding AB) which significantly increased the osteocompatibility. Ticer, a dental implant with anodically oxidized surface and the first among similar materials employed in clinical practice, was found to promote fast osteoblast cell differentiation and mineralization processes. Moreover, Ticer accelerate the integration with the bone, increase the bone/implant contact and improve primary and secondary stability of the implants. Additionally, potential innovations in this field such as fabrication of nanotubes on the implant surfaces as well as novel approaches (e.g. coating with proteins, nanostructured topography; combining implant body and surface derived from titanium and zirconia) are elaborated in this review. Besides, biochemical aspects on implant surface cell/tissue interaction are summarized. From the clinical point of view implant surfaces fabricated by ASD technology possess fast and improved osseointegration, high healing rates and long term prognosis. Copyright © 2016 Elsevier B.V. All rights reserved.

The evaluation of prepared microgroove pattern by femtosecond laser on alumina-zirconia nano-composite for endosseous dental implant application.

Author(s): Aivazi, Moluk; Hossein Fathi, Mohammad; Nejatidanesh, Farahnaz; Mortazavi, Vajihesadat; HashemiBeni, Batoul; Matinlinna, Jukka Pekka; Savabi, Omid

Abstract: Ceramic dental materials, especially alumina (20 %vol)-yttrium stabilized tetragonal zirconia poly crystal (A-Y-TZP20), have been considered as alternatives to metals for endosseous dental implant application. For increasing the bone-to-implant contact as well as the speed of bone formation, a new surface modification can be effective. The aim of this study was to design microgroove patterns by femtosecond laser on A-Y-TZP20 nano-composite disks for endosseous dental implant application. The phase composition and the morphology of the A-Y-TZP20 nano-composite samples were characterized using X-ray diffraction and Scanning electron microscopy equipped with energy dispersive X-ray spectroscopy techniques. Statistical analysis was submitted to Kolmogorov-Smirnov test and Student's t test for independent variables, with a 5 % significance level. EDAX analysis revealed a significant decrease in the relative content of contaminants like carbon ($p < 0.05$) in laser surface-treated group as compared to non surface-treated group. X-ray diffraction did not show any change in the crystalline structure induced by laser processing. It was concluded that the femtosecond laser is a clean and safe method for surface modification of A-Y-TZP20.

Database: Medline

Interventions for Dental Implant Placement in Atrophic Edentulous Mandibles: Vertical Bone Augmentation and Alternative Treatments. A Meta-Analysis of Randomized Clinical Trials.

Author(s): Camps-Font, Octavi; Burgueño-Barris, Genís; Figueiredo, Rui; Jung, Ronald E; Gay-Escoda, Cosme; Valmaseda-Castellón, Eduard

Source: Journal of periodontology; Dec 2016; vol. 87 (no. 12); p. 1444-1457

Abstract: The purpose of the current study is to assess which vertical bone augmentation techniques are most effective for restoring atrophic posterior areas of the mandible with dental implants and compare these procedures with alternative treatments.   Electronic literature searches in PubMed (MEDLINE), Ovid, and the Cochrane Library were conducted to identify all relevant articles published up to July 1, 2015. Eligibility was based on inclusion criteria, and quality assessments were conducted. The primary outcome variables were implant and prosthetic failure. After data extraction, meta-analyses were performed. Out of 527 potentially eligible papers, 14 randomized clinical trials were included. Out of these 14 studies, four trials assessed short implants (5 to 8 mm) as an alternative to vertical bone augmentation in sites with a residual ridge height of 5 to 8 mm. No statistically significant differences were found in implant (odds ratio [OR]: 1.02; 95% confidence interval [CI]: 0.31 to 3.31; P = 0.98; I(2): 0%) or prosthetic failure (OR: 0.64; 95% CI: 0.21 to 1.96; P = 0.43; I(2): 0%) after 12 months of loading. However, complications at treated sites increased with the augmentation procedures (OR: 8.33; 95% CI: 3.85 to 20.0; P <0.001; I(2): 0%). There was no evidence of any vertical augmentation procedure being of greater benefit than any other for the primary outcomes (implant and prosthetic failure). Short implants in the posterior area of the mandible seem to be preferable to vertical augmentation procedures, which present similar implant and prosthetic failure rates but greater morbidity. All the vertical augmentation technique comparisons showed similar intergroup results.

Randomised trial of bisphosphonate-coated dental implants: Radiographic follow-up after five years of loading.

Author(s): Abtahi, J; Henefalk, G; Aspenberg, P

Source: International journal of oral and maxillofacial surgery; Dec 2016; vol. 45 (no. 12); p. 1564-1569

Abstract: The results of a randomised trial with bisphosphonate-coated dental implants have been reported previously. Each patient received one coated and one uncoated implant in a double-blind split-mouth design study. After 6 months of osseointegration, resonance frequency analysis indicated better fixation of the coated implants. Reduced marginal bone resorption was also shown. However, it was not known whether the advantage of the bisphosphonate coating would persist over time. The radiographic results at 5 years after implant installation are reported herein. A blinded investigator measured marginal resorption on fresh radiographs obtained for 14 of the 16 patients (two had died) and compared these with the post-implantation images. Non-parametric statistics were used. All implants functioned well. The median marginal bone loss for control implants was found to be 0.70mm, which is less than usually reported in the literature. The bisphosphonate-coated implants showed even less resorption (median 0.20mm). The median difference within each pair of implants after 5 years of use was 0.34mm (95% confidence interval 0.00-0.75mm; P=0.04). The present data suggest that bisphosphonate-coated implants enable prolonged preservation of the marginal bone.   Copyright © 2016 International Association of Oral and Maxillofacial Surgeons. Published by Elsevier Ltd. All rights reserved.

A prospective study of the relationship between patient character and blood pressure in dental implant surgery.

Author(s): Wada, Masahiro; Miwa, Syunta; Mameno, Tomoaki; Suganami, Tohru; Ikebe, Kazunori; Maeda, Yoshinobu

Abstract: Patients often suffer from physical and mental stress in dental implant surgery. The aim of this prospective study is to investigate the relationship between patient character and blood pressure in dental implant surgery.   Fifteen patients were recruited for the present study. All patients had never received implant treatment in the past. To evaluate the patients' personality trait, NEO-Five Factor Inventory (NEO-FFI) was used. All patients answered 50 questions at the first visit and divided in five dimensions: neuroticism, extraversion, openness, agreeableness, and conscientiousness. The index of physical stress was evaluated by blood pressure and pulse rate. Ten females and five males (mean 55.5 ± 10.6 years) were evaluated in this study. A significant positive correlation was found between elevation rate of diastolic blood pressure/mean blood pressure and neuroticism score (rs = 0.584, 0.526, p < 0.05). On the other hand, there was no significant correlation between systolic blood pressure elevation and neuroticism score.   In this limited study, there was significant correlation between neuroticism character and diastolic blood pressure or mean blood pressure rising in patients who received implant surgery.

Prospective cohort study of dental implant success rate in patients with AIDS.

Author(s): May, Michael Clayton; Andrews, Paul Nielsen; Daher, Shadi; Reebye, Uday Nitin

Abstract: Oral health care of patients with acquired immune deficiency syndrome (AIDS) due to human immunodeficiency virus (HIV) is a growing area of concern, taking into consideration the increased life expectancy of patients resulting from antiretroviral therapy. There is insufficient literature regarding the impact of dental implants in AIDS patients. This study investigated the long-term clinical outcome of implant placement in patients diagnosed with AIDS.   This monocentric study included AIDS patients with CD4 <200 cells/μL, age 18 years or older, and a minimum of one edentulous space requiring implant. All patients in the study were undergoing highly active antiretroviral therapy (HAART). HAART includes nucleoside reverse transcriptase inhibitors (NRTIs), non-nucleoside reverse transcriptase inhibitors (NNRTIs), protease inhibitors (PIs), and integrase strand transfer inhibitors (INSTIs). Typical treatment includes two different NTRIs, along with a third drug, either an INSTI, a PI, or an NNRTI. Bicon dental implants were placed in the patients after medical clearance and were followed up for 5 years. Bicon system implants were chosen because of availability and previous experience with this brand. Implant success criteria are defined as implants that had no clinical mobility at uncovering, no radiographic radiolucency, and allowed for loading and abutment placement. Implant success in AIDS patients was measured over a period of 5 years. Descriptive statistics were used.   Sixteen adults met the inclusion criteria (12 males and 4 females) with mean CD4 count as 141.25 (sd 35.5). Thirty-three implants were placed in selected patients. Average time to uncovering was 151 days (sd 25 days). Two of the three failures were maxillary implants in the anterior arch, and the third was in the mandibular posterior arch. The study found a slightly higher failure rate of 10 % in patients with AIDS, compared to widely accepted failure rates in healthy patients at 5-7 %. With the advent of new medical therapies, even AIDS patients should be offered the option of root-formed implants as a viable alternative to fixed and removable prosthetics.

Osseointegration of TI6Al4V dental implants modified by thermal oxidation in osteoporotic rabbits.

Author(s): Bodelón, Oscar G; Clemente, Celia; Alobera, Miguel Angel; Aguado-Henche, Soledad; Escudero, María Lorenza; Alonso, María Cristina García

Abstract: In this work, the effect of the heat treatment on Ti6Al4V implants and topical administration of growth hormone to address a better osseointegration in osteoporotic patients has been analysed.   The osseointegration process of Ti6Al4V implants modified by oxidation treatment at 700 °C for 1 h and the influence of local administration of growth hormone (GH) in osteoporotic female rabbits after 15 and 30 days of implantation have been studied. Bone response was analysed through densitometric and histomorphometric studies. Characterization of the surface was provided by scanning electron microscopy. The oxidation treatment promotes the formation of an oxide scale grown on the Ti6Al4V implants that alters the nanoroughness of the surface. Bone mineral density (BMD) increases from 0.347 ± 0.014 (commercial) to 0.383 ± 0.012 g cm-2 (modified), and bone-to-implant contact (BIC) goes from 48.01 ± 14.78 (commercial) to 55.37 ± 15.31 (modified) after 30 days of implantation. The oxidation treatment on the Ti6Al4V dental implants enhances the early bone formation at the longest periods of implantation. No significant differences in the BMD and BIC results in healthy and osteoporotic rabbits were revealed with respect to the local administration of GH in the implantation site.

Biomechanical effects of offset placement of dental implants in the edentulous posterior mandible.

Author(s): Shimura, Yuta; Sato, Yuji; Kitagawa, Noboru; Omori, Miyuki

Abstract: Proper implant placement is very important for long-term implant stability. Recently, numerous biomechanical studies have been conducted to clarify the relationship between implant placement and peri-implant stress. The placement of multiple implants in the edentulous posterior mandible has been studied by geometric analysis, three-dimensional finite element analysis (FEA), model experimentation, etc. Offset placement is a technique that reduces peri-implant load. However, few studies have used multiple analyses to clarify the value of the offset placement under identical conditions. The present study aimed to clarify the biomechanical effects of offset placement on the peri-implant bone in edentulous posterior mandibles by comparative investigation using FEA and model experimentation with strain gauges. Three implants were embedded in an artificial mandible in the parts corresponding to the first premolar, the second premolar, and the first molar. A titanium superstructure was mounted to prepare models (experimental models). Three load points (buccal, central, and lingual) were established on the part of the superstructure corresponding to the first molar. Three types of experimental models, each with a different implant placement, were prepared. In one model, the implants were placed in a straight line; in the other two, the implants in the parts corresponding to the second premolar and the first molar were offset each by a 1-mm increment to the buccal or lingual side. Four strain gauges were applied to the peri-implant bone corresponding to the first molar. The experimental models were imaged by micro-computed tomography (CT), and FEA models were constructed from the CT data. A vertical load of 100 N was applied on the three load points in the experimental models and in the FEA models. The extent of compressed displacement and the strain in the peri-implant bone were compared between the experimental models and the FEA models.   Both experimental and FEA models suffered the least compressed displacement during central loading in all placements. The greatest stress and compressive strain was on the load side in all types of placements. Offset placement may not necessarily be more biomechanically effective than straight placement in edentulous posterior mandibles.

Continuous intra-sinus bone regeneration after nongrafted sinus lift with a PLLA mesh plate device and dental implant placement in an atrophic posterior maxilla: a case report.

Author(s): Kaneko, Takahiro; Nakamura, Satoshi; Hino, Shunsuke; Horie, Norio; Shimoyama, Tetsuo

Source: International journal of implant dentistry; Dec 2016; vol. 2 (no. 1); p. 16

Abstract: Sinus lift is a bone augmentation procedure that improves the alveolar crest height in an atrophic posterior maxilla. However, the regenerated bone volume can vary and generally has a tendency to decrease after sinus operation. This article describes nongrafted maxillary sinus lift using a bioresorbable unsintered hydroxyapatite combined with poly L-lactide (HA/PLLA) mesh plate device and dental implant placement in an atrophic posterior maxilla, after which continuous bone gain was observed around the implant apex during a postoperative follow-up period of 3 years. A 60-year-old healthy female was referred to our department for dental implant therapy in the right posterior maxilla. Clinical examination revealed that the maxilla was edentulous from the right first premolar to the second molar region. Radiographically, atrophy of the maxillary alveolar ridge in the same tooth site was observed. Sinus membrane elevation and simultaneous implant placement were performed through the lateral approach. HA/PLLA mesh was utilized to maintain space under the elevated sinus membrane and as a fixation device to replace the bone window. Six months later, new bone was generated in the secluded space maintained under the elevated sinus membrane. When observed 42 months after the implant insertion, bone volume around the implant apex had increased in vertical direction under the HA/PLLA mesh plate device, and there was continuous bone formation in the sinus over time. This nongrafted sinus lift procedure using an HA/PLLA mesh device attained predictable bone formation. Stable membrane elevation by an HA/PLLA device might induce long-term, continuous bone formation in the sinus.

Subjective and qualitative assessment of neural disturbance after inferior alveolar nerve transposition for dental implant placement.

Author(s): Nishimaki, Fumihiro; Kurita, Hiroshi; Tozawa, Shinya; Teramoto, Yuji; Nishizawa, Rishiho; Yamada, Shin-Ichi

Source: International journal of implant dentistry; Dec 2016; vol. 2 (no. 1); p. 14

Abstract: The purpose of this retrospective study was to accumulate data regarding the quality of postoperative neurosensory function after inferior alveolar nerve (IAN) transposition for dental implant placement.   The study included seven consecutive patients who underwent IAN transposition surgery for the insertion of a dental implant into the atrophic posterior mandible. Of these, six patients (seven sides) were available for long-term assessment of postoperative IAN function. Neurosensory disturbance of the IAN was assessed objectively using the modified SW perception test reported by Semmes and Weinstein. In addition, the quality of nerve paralysis was assessed according to the criteria reported by Highet. The median follow-up time was 49 months (range 12-105 months). No implant loss was observed during the follow-up. All patients experienced numbness immediately and the days after surgery. Complete recovery of neural function was observed on two sides; weak hypoesthesia was observed on two sides, moderate hypoesthesia on two sides, and severe hypoesthesia on one side. However, only one patient expressed concern about IAN function.   IAN transposition is a useful method for placing implants in the atrophic posterior mandible. However, the procedure is complicated, with the possibility of some degree of neurosensory disturbance, although in most of our cases, it resolved within a clinically acceptable period.

Dental implants in patients treated with antiresorptive medication - a systematic literature review.

Author(s): Walter, Christian; Al-Nawas, Bilal; Wolff, Tim; Schiegnitz, Eik; Grötz, Knut A

Abstract: Bisphosphonate-associated osteonecrosis of the jaws (BP-ONJ) is triggered by inflammatory processes. Typical trigger factors are periodontal disease, denture pressure sores, and surgical interventions such as tooth extractions. Unfortunately there is only little data on how to proceed with implant therapy in patients with bisphosphonate treatment. This topic is not addressed in the German guidelines on medication-associated osteonecrosis. Therefore a systematic literature review was performed.   The PICO design was used: (Patients) For which subclientel of patients with antiresorptive therapy (intervention) do dental implants have a benefit (control) compared to forgoing dental implants (outcome) in regards to oral rehabilitation and quality of life without having a substantial risk of BP-ONJ development? A PubMed search was performed including all studies dealing with this topic. Case reports and studies with less than 5 cases were excluded. There is only very little data available, mostly retrospective case series. 50 articles were analyzed in detail. BP-ONJ can be triggered by dental implants and by dentures in patients with benign and malignant primary diseases. In most studies, analyzing osteoporosis patients only, no cases of BP-ONJ were observed in patients with implant therapy in the time span observed. There are no studies about implant therapy in patients with malignant diseases. Many case series analyzing the trigger factors for BP-ONJ describe dentures as one of the main causes. Perioperative antimicrobial prophylaxis has a benefit in the prevention of BP-ONJ development.   Successful implant therapy is possible in patients receiving antiresorptive therapy. The possibility of osteonecrosis development needs to be explained to the patient. An individual risk assessment is essential, taking the primary disease with the medication and further wound-healing-compromising diseases and medications into account. If possible, bone augmentations should be avoided, and a perioperative antimicrobiological prophylaxis is strongly recommended in these patients.

Database: Medline

Dental implants and diabetes mellitus-a systematic review.

Author(s): Naujokat, Hendrik; Kunzendorf, Burkhard; Wiltfang, Jörg

Abstract: Dental implant surgery has developed to a widely used procedure for dental rehabilitation and is a secure and predictable procedure. Local and systemic risk factors can result in higher failure rates. Diabetes mellitus is a chronic disease that goes in with hyperglycemia and causes multifarious side effects. Diabetes as a relative contraindication for implant surgery is controversially discussed. Because the number of patients suffering from diabetes increases, there are more diabetic patients demanding implant procedures. We aimed to answer the PICO question "Do diabetic patients with dental implants have a higher complication rate in comparison to healthy controls?" by a systematic literature search based on the PRISMA statement. We identified 22 clinical studies and 20 publications of aggregated literature, which were quite heterogeneous concerning methods and results. We conclude that patients with poorly controlled diabetes suffer from impaired osseointegration, elevated risk of peri-implantitis, and higher level of implant failure. The influence of duration of the disease is not fully clear. The supportive administration of antibiotics and chlorhexidine seems to improve implant success. When diabetes is under well control, implant procedures are safe and predictable with a complication rate similar to that of healthy patients.

Influence of Implant Shape (Tapered vs Cylindrical) on the Survival of Dental Implants Placed in the Posterior Maxilla: A Systematic Review.

Author(s): Alshehri, Mohammed; Alshehri, Fahad

Abstract: The aim of this review was to assess the effect of implant shape (tapered vs cylindrical) on the survival of dental implants placed in the posterior maxilla.   Databases were searched from 1977 up to and including February 2015 using various key words. Only original clinical studies were included. Experimental studies, letters to the editor, review articles, case reports, and unpublished literature were excluded. The pattern of the present review was customized to mainly summarize the relevant information. Five studies were included. The number of patients included ranged between 4 and 29 participants. In total, 7 to 72 implants were placed in the posterior maxilla. Tapered and cylindrical shaped implants were placed in 1 and 1 study, respectively. In 1 study, both 41 tapered and cylindrical implant were placed. In all studies, rough-surfaced and threaded implants were used. Three studies reported the diameter and lengths of implants placed, which ranged between 3.75 to 4 mm and 10 to 20 mm, respectively. The mean follow-up period and survival rate of implants ranged between 19 and 96 months and 84.2% to 100%, respectively. In 1 study, implants were placed subcrestally in the posterior maxilla. Guided bone regeneration was performed in none of the studies. In all studies, participants were nonsmokers and were systemically healthy.   There is no influence of implant shape on the survival of implants placed in the posterior maxilla.

Radiographic Fractal and Clinical Resonance Frequency Analyses of Posterior Mandibular Dental Implants: Their Possible Association With Mandibular Cortical Index With 12-Month Follow-up.

Author(s): Tözüm, Tolga F; Dursun, Erhan; Uysal, Serdar

Abstract: The aim of the present study was to investigate whether the mandibular cortical index (MCI) has a relationship with fractal dimension of bone and/or implant stability, and to justify the possible association between MCI, fractal dimension, and stability.   Eighty-two subjects who received dental implants to replace missing mandibular premolar/molar sites were selected. Three months after surgical placement, implants were restored with fixed ceramic fused metal crowns. MCI was evaluated at baseline; fractal dimensions were measured with fractal analysis (FA) and implant stability quotient (ISQ) with resonance frequency analysis immediately after surgery and 12-month follow-up. FA at mesial and distal regions for Class 1, Class 2, and Class 3 MCI resulted with significant increases at 12-month follow-up compared to baseline. The ISQ in patients with Class 2 and Class 3 MCI resulted with a significant decrease compared to Class 1 MCI at baseline and at 12 months. All MCI classes evaluated with ISQ and FA at baseline values resulted with significant increases at 12 months. Significant correlations were considered for all mandibular posterior implants between baseline and 12-month measurements for ISQ and FA evaluations.   Fractal analysis may be a useful method for understanding the healing process around implants and implant stability quotient values. Mandibular cortical index evaluations should be considered before implant procedures, which may provide a presurgical treatment plan and may provide information about the mandibular bone quality.

Long-term success of dental implant-supported dentures in postirradiated patients treated for neoplasms of the maxillofacial skeleton: a retrospective study.

Author(s): Wu, Yiqun; Huang, Wei; Zhang, Zhiyong; Zhang, Zhiyuan; Zou, Duohong

Abstract: The reconstruction of oral function in irradiated patients with craniofacial tumors is a significant challenge. The aim of this study was to detect long-term success of dental implant-supported dentures in postirradiated patients treated for neoplasms of the maxillofacial skeleton. From 2004 to 2011, 36 irradiated patients underwent oral function reconstruction using implant-

supported prostheses. Bone augmentation was completed using vascularized bone grafts in 22 patients. Fourteen patients were treated by hyperbaric oxygen therapy (HBO). A total of 198 dental implants were used in jaw rehabilitation. After loading, implant success rates, biological and prosthetic complications, patient satisfaction, and psychological changes were recorded. Bone augmentation of the jaw was successful and vascularized grafts provided an additional vascular supply in compromised irradiated tissue. Rehabilitation was successful in all of the patients after loading. Thirty-eight dental implants failed, and 35 implants were removed. The success rate of the implants was 93.6 % for 10 years after loading. It was not a significant difference in implant success rate between the HBO group and the other groups. The prosthodontic maintenance results and complication rates showed that patients required intervention 0.19 times per year. All patients were satisfied with the oral restoration results.   The restoration of oral function in radiotherapy patients with tumor resection using implant-supported prostheses is a viable treatment option. Either alone or in combination with HBO, dental implant-supported prostheses can be used an effective therapeutic approach for irradiated patients with oral function reconstruction.

A prospective clinical study to evaluate the performance of zirconium dioxide dental implants in single-tooth gaps.

Author(s): Gahlert, Michael; Kniha, Heinz; Weingart, Dieter; Schild, Sabine; Gellrich, Nils-Claudius; Bormann, Kai-Hendrik

Abstract: Dental implants have traditionally been made from titanium or its alloys, but recently full-ceramic implants have been developed with comparable osseointegration properties and functional strength properties to titanium. These ceramic implants may have advantages in certain patients and situations, for example, where esthetic outcomes are particularly important.   The objective of this investigation was to evaluate the performance of a newly developed full-ceramic ZrO2 monotype implant design (PURE Ceramic Implant; Institut Straumann AG, Basel, Switzerland) in single-tooth gaps in the maxilla and mandible. This was a prospective, open-label, single-arm study in patients requiring implant rehabilitation in single-tooth gaps. Full-ceramic implants were placed, with provisional and final prostheses inserted after 3 and 6 months, respectively. Crestal bone level was measured at implant placement and after 6 and 12 months. Implant survival and success were evaluated after 6 and 12 months. Further evaluations are planned after 24 and 36 months. Forty-six patients were screened for potential study participation, of whom 44 (17 men and 27 women, mean age 48 ± 14 years) were recruited into the study. The majority of implants (90.9%) were placed in the maxilla. The implant survival and implant success rate after 12 months were 97.6%. A minor change of the mean bone level occurred between implant loading (final prosthesis insertion after 6 months) and 12 months (-0.14 mm) after initial bone remodeling was observed between implant placement and loading (-0.88 mm). The results indicated that monotype ceramic implants can achieve clinical outcomes comparable to published outcomes of equivalent titanium implants.   © 2015 John Wiley & Sons A/S. Published by John Wiley & Sons Ltd.

Evaluation of the first maxillary molar post-extraction socket as a model for dental implant osseointegration research.

Author(s): Du, Zhibin; Lee, Ryan S B; Hamlet, Stephen; Doan, Nghiem; Ivanovski, Saso; Xiao, Yin

Abstract: Published information regarding the use of rat jawbones for dental implant osseointegration research is limited and often inconsistent. This study assessed the suitability and feasibility of placing dental implants into the rat maxilla and to establish parameters to be used for

dental implant research using this model.   Forty-two customized titanium implants (2 × 3 mm) were placed bilaterally in the maxillary first molar area of 21 Sprague-Dawley rats. Every animal received two implants. The animals were subsequently sacrificed at days 3, 7, 14, 28 and 56 post-surgery. Resin-embedded sections of the implant and surrounding maxilla were prepared for histological and histomorphometric analyses.   The mesial root of the first molar in the rat maxilla was the optimal site to place the implant. Although the most apical 2-3 threads of the implant penetrated into the sinus cavity, 2 mm of the remaining implant was embedded in the bone. New bone formation at day 7 around the implant increased further at day 14, as measured by the percentage of bone-to-implant contact (%BIC) and new bone area (%BA) in the implant thread chambers (55.1 ± 8.9% and 63.7 ± 7.7%, respectively). There was a further significant increase between day 14 and 28 (P < 0.05), however, no significant differences were found between day 28 and 56 in either %BIC or %BA.   The mesial root socket of the first molar in the rat maxilla is a useful model for dental implant research. Osseointegration following implant placement as measured by BIC plateaued after 28 days. The recommended implant dimensions are 1.5 mm in diameter and 2 mm in length. © 2015 John Wiley & Sons A/S. Published by John Wiley & Sons Ltd.

Antihypertensive Medications and the Survival Rate of Osseointegrated Dental Implants: A Cohort Study.

Author(s): Wu, Xixi; Al-Abedalla, Khadijeh; Eimar, Hazem; Arekunnath Madathil, Sreenath; Abi-Nader, Samer; Daniel, Nach G; Nicolau, Belinda; Tamimi, Faleh

Source: Clinical implant dentistry and related research; Dec 2016; vol. 18 (no. 6); p. 1171-1182

Abstract: Antihypertensive drugs in general are beneficial for bone formation and remodeling, and are associated with lower risk of bone fractures. As osseointegration is influenced by bone metabolism, this study aimed to investigate the association between antihypertensive drugs and the survival rate of osseointegrated implants.   This retrospective cohort study included a total of 1,499 dental implants in 728 patients (327 implants in 142 antihypertensive-drugs-users and 1,172 in 586 nonusers). Multilevel mixed effects parametric survival analyses were used to test the association between antihypertensive drugs use and implant failure adjusting for potential confounders. Only 0.6% of the implants failed in patients using antihypertensive drugs while 4.1% failed in nonusers. A higher survival rate of dental implants was observed among users of antihypertensive drugs [HR (95% CI): 0.12 (0.03-0.49)] compared to nonusers. Our findings suggest that treatment with antihypertensive drugs may be associated with an increased survival rate of osseointegrated implants. To our knowledge, this could be the first study showing that the systemic use of a medication could be associated with higher survival rate of dental implants.   © 2016 Wiley Periodicals, Inc.

Damping Factor as a Diagnostic Parameter for Assessment of Osseointegration during the Dental Implant Healing Process: An Experimental Study in Rabbits.

Author(s): Feng, Sheng-Wei; Ho, Kuo-Ning; Chan, Ya-Hui; Chang, Kai-Jung; Lai, Wei-Yi; Huang, Haw-Ming

Source: Annals of biomedical engineering; Dec 2016; vol. 44 (no. 12); p. 3668-3678

Abstract: The purpose of this study was to evaluate the possibility of using damping factor (DF) analysis to provide additional information on osseointegration of dental implants during the healing period. A total of 30 dental implants were installed in the bilateral femoral condyles of 15 rabbits. A DF analyzer detected with an impulse-forced vibration method and a commercialized dental implant stability analyzer based on resonance frequency (RF) analysis were used to measure the implant stability immediately after implant placement and 1, 2, 4, and 8 weeks post-surgically. Results of DF

and RF analyses at different time points were compared with the corresponding osseointegration performance of dental implants via micro-computed tomography (micro-CT), histological and histomorphometrical analysis. The DF values revealed a decrease with time and reached 0.062 ± 0.007 at 8 weeks after implantation, which is almost 50% lower than the initial value. Moreover, highly significant correlations between DF values and bone volume densities (R^2 = 0.9797) and percentages of bone-to-implant contact measured at trabecular bone area (R^2 = 0.9773) were also observed. These results suggested that DF analysis combined with RF analysis results in a more sensitive assessment of changes in the dental implant/bone complex during the healing period than RF analysis alone.

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Nov/ Dec 2016, Volume 31, Issue 6

International Journal of Prosthodontics

Nov/ Dec 2016 Volume 29 , Issue 6

Journal of Clinical Periodontology

December 2016 Volume 43, Issue 12

Exercise: Sensitivity and Specificity

Sensitivity:
If a person has a disease, how often will the test be positive (true positive rate)?

If the test is highly sensitive and the test result is negative you can be nearly certain that they don't have disease.

Specificity:
If a person does not have the disease how often will the test be negative (true negative rate)?

If the test result for a highly specific test is positive you can be nearly certain that they actually have the disease.

Quick Quiz:

1. **A very sensitive test, when negative, helps you:**
   a: Rule-in disease
   b: Rule-out disease
   c: Confuse medical students
   d: Save money

2. **A test which is highly specific, when positive, helps you:**
   a: Rule-in disease
   b: Rule-out disease
   c: Confuse medical students
   d: Save money

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Answers: 1b; 2a

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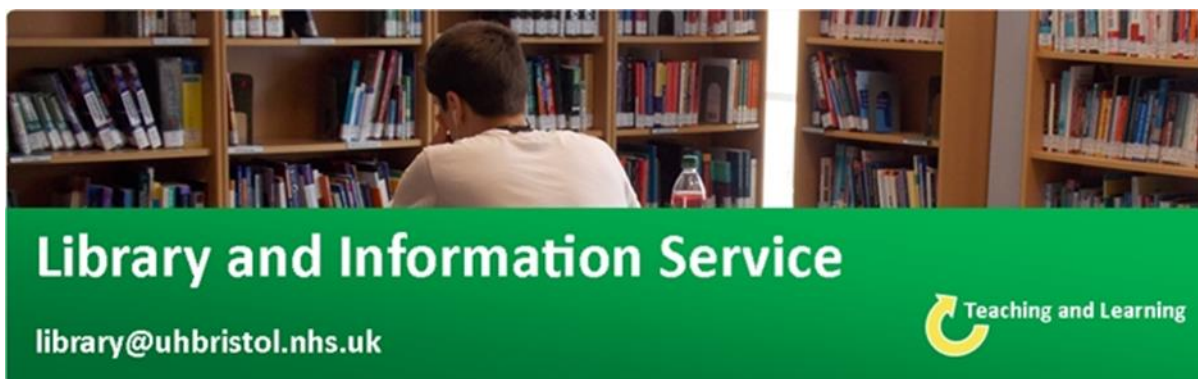
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