**Systemic conditions and treatments as risks for implant therapy.**

Bornstein MM, Cionca N, Mombelli A.


**Abstract**

**PURPOSE:** To evaluate whether systemic diseases with/without systemic medication increase the risk of implant failure and therefore diminish success and survival rates of dental implants.

**MATERIALS AND METHODS:** A MEDLINE search was undertaken to find human studies reporting implant survival in subjects treated with osseointegrated dental implants who were diagnosed with at least one of 12 systemic diseases.

**RESULTS:** For most conditions, no studies comparing patients with and without the condition in a controlled setting were found. For most systemic diseases there are only case reports or case series demonstrating that implant placement, integration, and function are possible in affected patients. For diabetes, heterogeneity of the material and the method of reporting data precluded a formal meta-analysis. No unequivocal tendency for subjects with diabetes to have higher failure rates emerged. The data from papers reporting on osteoporotic patients were also heterogeneous. The evidence for an association between osteoporosis and implant failure was low. Nevertheless, some reports now tend to focus on the medication used in osteoporotic patients, with oral bisphosphonates considered a potential risk factor for osteonecrosis of the jaws, rather than osteoporosis as a risk factor for implant success and survival on its own.

**CONCLUSIONS:** The level of evidence indicative of absolute and relative contraindications for implant therapy due to systemic diseases is low. Studies comparing patients with and without the condition in a controlled setting are sparse. Especially for patients with manifest osteoporosis under an oral regime of bisphosphonates, prospective controlled studies are urgently needed.

- Artikel frei einsehbar auf den Internetseiten des ITI
- Proceedings of the 4th ITI consensus conference unter Publikationen
Dental endosseous implants in the medically compromised patient.

Scully C, Hobkirk J, Dios PD.


Abstract

The literature contains numerous observations on the significance of systemic disorders as contraindications to dental endosseous implant treatment, but the justification for these statements is often apparently allegorical. Although implants are increasingly used in healthy patients, their appropriateness in medically compromised patients is less equivocal. Perhaps surprisingly, the evidence of their efficacy in these groups of patients is quite sparse. Indeed, there are few if any randomized controlled trials (RCTs) in this field. Furthermore, any health risks from the placement of implants are unclear. We review the current evidence for the risks associated with endosseous implants in a range of systemic disorders. There is clearly a need for prospective systematic trials. The degree of disease-control may be far more important that the nature of the disorder itself, and individualized assessment, including the medical condition, quality of life and life expectancy is indicated. The benefits of implants to many of these patients may outweigh any risks. However, proper informed consent is mandatory.

Patient selection for endosseous dental implants: oral and systemic considerations.

Sugerman PB, Barber MT.


Abstract

This paper reviews the literature and discusses patient selection for endosseous dental implants and the effect of systemic and local pathology on the success rate of dental implants. Endosseous dental implants may be preferable to conventional dentures in patients with compromised supporting bone or mucosa, xerostomia, allergy to denture materials, severe gag reflex, susceptibility to candidiasis, diseases affecting orofacial motor function or in patients who demand optimal bite force, esthetics, and phonetics. Conventional dentures or fixed partial prostheses may be preferable to endosseous dental implants in growing and epileptic patients and patients at risk of oral carcinoma, anaphylaxis, severe hemorrhage, steroid crisis, endocarditis, osteoradionecrosis, myocardial infarction, or peri-implantitis. A systematic approach to dental implant patient selection is outlined and centralized reporting of dental implant outcomes is recommended.
Systemic diseases affecting osseointegration therapy.

Mombelli A, Cionca N.


Erratum in:


Abstract

OBJECTIVES: To evaluate the impact of systemic diseases and their treatment on the success of osseointegration therapy.

MATERIAL AND METHODS: A search was made to find human studies including subjects treated with osseointegrated oral implants, with a diagnosis of 11 systemic diseases, and reporting at least implant survival.

RESULTS: For most conditions, no studies comparing patients with and without the condition in a controlled setting were found. The evidence to recommend implant therapy was low and consisted in presentations of some successfully treated cases. With regard to diabetes, three types of reports were found: eight case series of diabetic patients treated with implants, six cross-sectional, longitudinal or retrospective evaluations of groups of subjects treated with implants, including some diabetic patients, and one matched control retrospective chart survey. The heterogeneity of the material and the method of data reporting precluded a formal meta-analysis. No unequivocal tendency for subjects with diabetes to have higher failure rates emerged, but the largest of these studies indicated a significant increase in the relative risk of implant failure with diabetes. The data obtained from 17 papers reporting data from osteoporotic patients were also heterogeneous. The evidence for an association of osteoporosis and implant failure was low.

CONCLUSIONS: The level of evidence indicative of absolute and relative contraindications for implant therapy due to systemic diseases is low. Many conditions have been listed as potentially critical, but studies comparing patients with and without the condition in a controlled setting are sparse.

Impact of local and systemic factors on the incidence of late oral implant loss.

Alsaadi G, Quirynen M, Komárek A, van Steenberghe D.


Comment in:


Abstract

BACKGROUND: This retrospective study was set to assess the influence of systemic and local bone and intra-oral factors on the occurrence of implant loss from abutment connection up to 2 years.
MATERIALS AND METHODS: The files of 700 patients, have been collected randomly from the total patient group treated by means of endosseous Brånemark system implants (Nobel Biocare, Gothenburg, Sweden) at the Department of Periodontology of the University Hospital of the Catholic University of Leuven. The end point observation was evaluating the loss of the implants 2 years after abutment installation. The study involved all implants that did not encounter early loss and implants for which it was possible to evaluate its status 2 years after abutment surgery. Thus, data of 412 patients (240 females) provided with 1514 implants were analyzed. For each patient, the medical history was carefully checked. Data collection and analysis were mainly focused on endogenous factors such as hypertension, coagulation problems, osteoporosis, hypo-hyperthyroidism, chemotherapy, diabetes type I or II, Crohn’s disease, some local factors [e.g. bone quality and quantity, implant (length, diameter, location), type of edentulism, PTV, radiotherapy], smoking habits, and breach of sterility during surgery.

RESULTS: Radiotherapy, implant (diameter and location), and higher PTV at implant insertion and abutment connection, all affected significantly the implant loss.

CONCLUSION: Implant location in the oral cavity and radiotherapy seem predominant to explain the occurrence of implant loss. On the other hand, smoking and systemic health factors do not seem to be prominent players in the etiology of late implant loss.

Impact of local and systemic factors on the incidence of oral implant failures, up to abutment connection.

Alsaadi G, Quirynen M, Komárek A, van Steenberghe D.


Abstract

AIM: The aim of this retrospective study was to assess the influence of systemic and local bone and intra-oral factors on the occurrence of early implant failures, i.e. up to the abutment connection.

MATERIAL AND METHODS: The surgical records of 2004 consecutive patients from the total patient population who had been treated in the period 1982-2003 (with a total of 6946 Brånemark system implants) at the Department of Periodontology of the Catholic University Leuven were evaluated. For each patient the medical history was carefully checked. Data collection and analysis mainly focused on endogenous factors such as hypertension, coagulation problems, osteoporosis, hypo-hyperthyroidism, chemotherapy, diabetes type I or II, Crohn’s disease, some local factors [e.g. bone quality and quantity, implant (length, diameter, location), type of edentulism, Periotest value at implant insertion, radiotherapy], smoking habits and breach of sterility during surgery.

RESULTS: A global failure rate of 3.6% was recorded. Osteoporosis, Crohn’s disease, smoking habits, implant (length, diameter and location) and vicinity with the natural dentition were all significantly associated with early implant failures (p<0.05).
CONCLUSION: The indication for the use of oral implants should sometimes be reconsidered when alternative prosthetic treatments are available in the presence of possibly interfering systemic or local factors.

Altered healing following mucogingival surgery in a patient with Crohn's disease: a literature review and case report.
Andersen KM, Selvig KA, Leknes KN.

Abstract
BACKGROUND: Crohn's disease is a chronic inflammatory bowel disease characterized by uncertainty in etiology and pathogenesis occasionally with manifestations in oral mucous membranes. This report reviews the literature on Crohn's disease and presents a patient with Crohn's disease on continuous anti-inflammatory and immunosuppressive medication who showed adverse healing response following surgical treatment of gingival recession type defects.

METHODS: A 28-year-old male in generally good health apart from his bowel disease requested treatment of multiple maxillary gingival recessions due to esthetic concerns and root sensitivity. Following oral hygiene instruction, 3 coronally advanced flap procedures were performed in the maxillary anterior region to cover the defects. In 2 of the surgical areas, the exposed root surfaces were treated by ethylenediaminetetraacetic acid (EDTA) in combination with enamel matrix derivative (EMD) before coronally positioning the buccal flap. Postoperatively, chlorhexidine gluconate was used for oral hygiene control.

RESULTS: The first surgical procedure, performed as a coronally advanced flap, showed delayed and altered healing. Two weeks postoperatively, the flapped tissue remained intensely red and swollen. In the following 2 surgical sites where EDTA and EMD were applied the healing was uneventful. Differences in immediate tissue response, however, did not influence the 3-month treatment outcome with respect to root coverage.

CONCLUSIONS: Patients with Crohn's disease on recommended systemic medications may show a delayed and altered wound healing indicating that periodontal surgery must be closely monitored. Treatment planning should take into account the potential wound healing promoting effects of enamel matrix derivative as well as adverse healing effects of chlorhexidine gluconate administration.

Consensus statements and recommended clinical procedures regarding risk factors in implant therapy.
Cochran DL, Schou S, Heitz-Mayfield LJ, Bornstein MM, Salvi GE, Martin WC.

Artikel frei einsehbar unter:
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CONCLUSIONS: The level of evidence indicative of absolute and relative contraindications for implant therapy due to systemic diseases is low. Studies comparing patients with and without the condition in a controlled setting are sparse. Especially for patients with manifest osteoporosis under an oral regime of bisphosphonates, prospective controlled studies are urgently needed.
Medical contraindications to implant therapy: Part II: Relative contraindications.

Hwang D, Wang HL.


Abstract

Systemic conditions and habits influence dental implant survival to varying degrees. Illnesses that impair the normal healing cascade worsen surgical success. The mere presence of a disease, however, does not necessarily preclude implant therapy or affect significantly long-term outcomes. Certain disorders, when controlled, or other situations allow implant survival rates that match those in health. This paper reviews these relative contraindications, which include adolescence, aging, osteoporosis, smoking, diabetes, positive interleukin-1 genotype, human immunodeficiency virus positivity, cardiovascular disease, and hypothyroidism.

Medical contraindications to implant therapy: part I: absolute contraindications.

Hwang D, Wang HL.


Abstract

In order to ensure implant success, it is essential to select patients who do not possess local or systemic contraindications to therapy. Hence, it is the purpose of this paper to review the medical diseases that reportedly preclude conventional dental implant treatment. Absolute contraindications to implant rehabilitation include recent myocardial infarction and cerebrovascular accident, valvular prosthesis surgery, immunosuppression, bleeding issues, active treatment of malignancy, drug abuse, psychiatric illness, as well as intravenous bisphosphonate use. Any of these conditions bar elective oral surgery, and require judicious monitoring by the physician as well as the dental provider. Noncompliance to the suggested protocol may, in the worst possible case, result in patient mortality.

[Surgical dilemmas. Medical restrictions and risk factors]

[Article in Dutch]

Meijer GJ, Cune MS.


Abstract

In principle, only patients with an ASA (American Society of Anaesthesiologists)-score I or II qualify for an elective surgical procedure, such as an implantation treatment. Surgical risks
are weighed against the potential benefits offered by oral implants. Counter-indications to implant rehabilitation include recent myocardial infarction and cerebrovascular accident, immunosuppression, active treatment of malignancy, drug abuse, as well as long-standing intravenous bisphosphonate use. In the case of patients with an endocarditis risk, and also in the case of patients with an orthopedic prosthesis, implants should be placed with some reluctance. If the decision is made for treatment, then consultation with the treating specialist is recommended. Beside absolute counter-indications, there are also conditions which compromise the success of an implant treatment, such as radiation of the jaw or long-term smoking. Concerning the effect which medical conditions have on the life-expectancy of the implant, little is known. There appear to be few existing factors which actually have a negative influence on the chance that an implant will survive.

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Sugerman PB, Barber MT.


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CONCLUSION: The indication for the use of oral implants should sometimes be reconsidered when alternative prosthetic treatments are available in the presence of possibly interfering systemic or local factors.

Dental implant failure rates and associated risk factors.

Moy PK, Medina D, Shetty V, Aghaloo TL.


Abstract

PURPOSE: To guide treatment planning by analyzing the rates of dental implant failure to determine associated risk factors.

MATERIALS AND METHODS: All consecutively treated patients from January 1982 until January 2003 were included in a retrospective cohort study, as defined in the hierarchy of evidence for dental implant literature. Data regarding gender, age, implant location, bone quality, bone volume, and medical history were recorded. Correlations between these data and implant survival were calculated to establish relative risk (RR) ratios.

RESULTS: Increasing age was strongly associated with the risk of implant failure. Compared to patients younger than 40 years, patients in the 60-to-79 age group had a significantly higher risk of implant failure (RR = 2.24; P < .05). Gender, hypertension, coronary artery disease, pulmonary disease, steroid therapy, chemotherapy, and not being on hormone replacement therapy for postmenopausal women were not associated with a significant increase in implant failure. Smoking (RR = 1.56), diabetes (RR = 2.75), head and neck radiation (RR = 2.73), and postmenopausal estrogen therapy (RR = 2.55) were correlated with a significantly increased failure rate. Overall, implant failure was 8.16% in the maxilla and 4.93% in the mandible (P < .001).

DISCUSSION: Patients who were over age 60, smoked, had a history of diabetes or head and neck radiation, or were postmenopausal and on hormone replacement therapy experienced significantly increased implant failure compared with healthy patients.
CONCLUSION: Overall, dental implant failure is low and there are no absolute contraindications to implant placement. Conditions that were found to be correlated with an increased risk of failure should be considered during treatment planning and factored into the informed consent process.

**Effects of steroid-induced osteoporosis on osseointegration of titanium implants.**


Fujimoto T, Niimi A, Sawai T, Ueda M.

Abstract

The purpose of this study was to clarify the effects of steroid administration on the osseointegration of pure titanium implants. Twelve female New Zealand white rabbits, 8 weeks of age, were divided into two groups: a prednisolone-treated group (Group P) and a control group (Group C). In each rabbit, two implants were placed into the mandible and two into the tibial metaphyses with bone tapping. The six steroid-treated rabbits received three courses of 4 days of prednisolone injections (10 mg/kg per day) before implant placement, 1 month and 2 months after implant placement. The six control rabbits received no administration of prednisolone. Three months after implant placement, all rabbits were sacrificed. Bone density of the femur and removal torque of the implants placed in the tibia were significantly lower in Group P than in Group C. In addition, there were significant correlations between the bone density of the femur and the removal torque of the implants placed in the tibia. There was no significant difference in removal torque of the implants placed in the mandible between Group P and Group C, and there was no significant correlation between the bone density of the femur and the removal torque of the implants placed in the mandible. These results suggest that steroid administration could have less effect on the osseointegration of titanium implants in the mandible than in the skeletal bone.

**Risk factors associated with dental implants in healthy and medically compromised patients.**

Smith RA, Berger R, Dodson TB.


Abstract

A total of 104 consecutive patients treated with 313 Nobelpharma implants was studied to determine the medical risks associated with dental implants. There did not appear to be an increased implant failure rate or an increase in perioperative morbidity in patients with a compromised medical status. Age; sex; and concurrent use of hypoglycemic agents, supplemental female hormones, or steroids also did not correlate with increased implant failure or perioperative morbidity. Implant procedures using a variety of pain-/anxiety-control agents failed to reveal any increase in anesthetic-related complications. However, the number of implants placed per patient did correlate with implant failure. It appears that
implant surgery and the required anesthetic appear to be safe procedures even in the medically compromised patient.

**Endosteal implants in a patient with corticosteroid dependence.**

Cranin AN.  

**Endosseous dental implants and the glucocorticoid-dependent patient.**

Steiner M, Ramp WK.  

**Effect of glucocorticoid-induced osteoporotic-like conditions on osteoblast cell attachment to implant surface microtopographies.**

Cho P, Schneider GB, Kellogg B, Zaharias R, Keller JC.  

**Abstract**

OBJECTIVES: The objectives of this work were to: (1) establish methodology for pretreating osteoblast-like cells in vitro with dexamethasone to cause glucocorticoid-induced osteoporosis, (2) perform quantitative and qualitative assessments of cellular attachment of osteoporosis-like osteoblasts when grown on implant surfaces of differing roughness, (3) and explore the hypothesis that dexamethasone-treated osteoblasts have altered cell attachment properties by focal adhesion disassembly and decreased tyrosine phosphorylation of the focal adhesion tyrosine kinase.

METHODS: Osteoblasts were cultured with dexamethasone (10(-7) and 10(-6) M) for up to 4 days of incubation to induce osteoporosis-like conditions. Cellular attachment assays demonstrated the effect of dexamethasone treatments on cellular attachment properties of osteoblasts. Qualitative data were obtained utilizing immunofluorescent microscopy and Western blotting. Focal adhesion kinase (FAK) immunoprecipitation and tyrosine-phosphorylation Western blots were obtained from dexamethasone-treated human embryonic palatal mesenchymal- 1486 osteoblast cultures supplemented with ascorbate and beta-glycerol phosphate medium.

RESULTS: Cellular attachment was significantly greater (P < 0.05) with non-dexamethasone-treated osteoblasts (92%) as compared to dexamethasone-treated osteoblasts after 1 (72%), 2 (63%), and 4 days (53%) of exposure. Dexamethasone-treated osteoblasts were viable and capable of proliferation, suggesting that the reduction of cellular attachment may be
related to these cell adhesion processes. Immunofluorescent microscopy of both
dexamethasone-treated osteoblasts and non-dexamethasone-treated osteoblasts failed to
show any relative difference in the disassembly of focal adhesions and actin filaments.
Extended dexamethasone treatment periods (up to 3 weeks) showed changes in the levels
of FAK and FAK-phosphotyrosine in human embryonic palatal mesenchymal-1486
osteoblasts.

CONCLUSIONS: The protocol used in this study demonstrated a glucocorticoid-induced
osteoarthritis-like suppression of osteoblasts. FAK disassembly was not a significant factor in
short period; however, FAK protein levels and phosphotyrosine signaling on FAK were
affected after 1-week exposure to dexamethasone. Phosphorylated FAK was not associated
with the rise in the level of FAK, further indicating the possibility of FAK involvement in
reduced cell attachment.

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**Treatment with dental implants in patients with severe osteoporosis: a case report.**

Friberg B.


**Abstract**

The case report of a woman with severe osteoporosis who was treated with dental implants
is presented. Polyarthritis was diagnosed in 1955, and a corticosteroid medication
treatment was started in 1960. During the years, the patient has undergone multiple joint
surgeries. Dental implants were inserted in the maxilla in 1987 and in the mandible in 1988.
Due to a compression of the spine, the patient lost 12 cm in body height between 1991 and
1993; a spontaneous femur fracture was diagnosed in December 1992. However, the arch
bone has been stable; the 6- and 5-year follow-up results of the maxillary and mandibular
implants, respectively, are presented.