

SHORT VERSUS STANDARD LENGTH IMPLANTS: A CASE SERIES ANALYSIS

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The use of short implants (SIs) has had a great success, particularly in posterior jaws, because SIs avoid the need of alveolar crest reconstruction or sinus lifting. The aim of this study is to perform a retrospective study on 808 SIs to evaluate their survival rate. In the period between January 2008 and December 2013, 877 patients (498 females and 379 males) were operated at the BDD private Practice Clinic (Milan, Italy). The mean post-surgical follow-up was 30 ± 17 months (max – min, 84 – 1). Eight hundred and eight implants (EDIERRE Implant System SpA, Genoa, Italy) were included in the present study, 119 (14.7%) 9.0 mm (i.e. short) and 689 (85.3%) 11.0 mm long. All patients underwent the same surgical protocol and agreed to participate in a post-operative check-up program. SPSS program was used for statistical analysis. Survival rate (SVR) was 97.4% since only 21 fixtures were lost from a total of 808 implants. Cross-tabulation between failures and immediate loading had a statistical significant value ($p = 0.006$) in respect to delayed loading. There were 10 failures out of 161 immediate loaded implants compared to 11 failures out of 626 delayed loaded fixtures. SIs are reliable devices for oral rehabilitation.

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DISCLOSURE: ALL AUTHORS REPORT NO CONFLICTS OF INTEREST RELEVANT TO THIS ARTICLE.

PILOT EVALUATION OF A SIMPLE ADJUNCTIVE METHOD FOR IMPROVED REMOVAL OF ORAL BIOFILM DURING CONVENTIONAL SCALING AND ROOT PLANING THERAPY

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Various studies have evaluated the adjunctive use of chemical and antimicrobial treatments to assist in the mechanical removal of oral microbial biofilm from tissue surfaces during scaling and root planning therapy (SRP). The current study demonstrates the elimination of two classes of surrogate molecular markers from periodontal disease sites. This suggests the current agent may be a more effective adjunctive cleansing agent for complete biofilm removal. A patient with advanced chronic periodontitis was subjected to standard SRP therapy, supplemented by irrigation with HYBENX[®] (HBX). Samples of gingival crevicular fluid were collected with triplicate absorbent paper points from each of three quadrants at three time points: 1) at baseline prior to treatment; 2) after irrigation with the topical agent for 20 seconds and rinsing; and 3) after SRP followed by a second irrigation/rinsing treatment with the agent. Paper points were extracted to assess the presence of 13 bacterial species known to be primarily associated with periodontal disease using DNA pyrosequencing. In addition, the presence of Matrix Metalloproteinase-8 (MMP8), as well as IL-1 β , IL-6, and TNF-alpha were also assessed by immunoassay of the paper point sample extracts. The combined adjunctive treatment indicated a complete absence of detectable bacterial DNA and the four inflammatory mediators from samples taken from the gingival sulci treated with HBX. The advantage of the current adjunctive topical treatment technique is that it is simple and easy to administer in conjunction with standard SRP techniques. It appears to provide a level of cleanliness not currently achieved with other SRP adjunctive procedures.

COMPARISON BETWEEN LONG AND STANDARD LENGTH IMPLANTS

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Long implants (LI, i.e. longer than 13 mm) are thought to give longer survival than standard length fixtures. The aim of this study is to evaluate the survival rate of 780 LI. In the period between January 2008 and December 2013, 877 patients (498 females and 379 males) were operated at the BDD private Practice Clinic (Milan, Italy). The mean post-surgical follow-up was 30 ± 17 months (max – min, 84 – 1). One thousand seven hundred and fifty-three fixtures (EDIERRE Implant System SpA, Genoa, Italy) were evaluated in the present study, 780 15 mm long (LI) and 972 13 mm long (i.e. standard length implants). All patients underwent the same surgical protocol and agreed to participate in a post-operative check-up program. SPSS program was used for statistical analysis. Survival rate (SVR) was 97.8% since only 38 fixtures were lost from a total of 1,752 implants. Cross-tabulation between failures and jaws had a statistical significant value ($p= 0.027$) with worse results for maxilla (23 failures out of 768 implants). Also tooth position has an impact ($p= 0.027$) since incisors plus canines had 18 failures out of 550 implants whereas premolars and molars had 20 lost fixtures out of 1,202. LIs give a small but significant advantage in oral rehabilitation.

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IMMEDIATE VERSUS DELAYED LOADING IMPLANTS: RATIONALE AND CONTROVERSIES

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Loading implants immediately after their position in alveolar bone crest is a procedure that has become popular in the last decade. The aim of this study is to evaluate the survival rate of 811 immediate loaded implants (ILIs). In the period between January 2008 and December 2013, 877 patients (498 females and 379 males) were operated at the BDD private Practice Clinic (Milan, Italy). The mean post-surgical follow-up was 30 ± 17 months (max – min, 84 – 1). One thousand three hundred and eighty-six fixtures (EDIERRE Implant System SpA, Genoa, Italy) were evaluated in the present study, 811 immediately loaded and 575 loaded after 3 months. All patients underwent the same surgical protocol and agreed to participate in a post-operative check-up program. SPSS program was used for statistical analysis. Survival rate (SVR) was 97.3% since only 38 fixtures were lost from a total of 1,348 implants. Cross-tabulation between failures demonstrated slight but significant worse results for ILIs ($p = 0.037$). There were 28 failures out of 811 ILIs whereas only 10 fixtures were lost out of 565 implants loaded after 3 months. Immediate loading performed in selected cases is a reliable tool for oral rehabilitation.

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**IMPLANTS INSERTED IN POST EXTRACTIVE SOCKETS HAVE SURVIVAL RATES
SIMILAR TO FIXTURES INSERTED IN HEALED BONE:
A CASE SERIES STUDY**

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Post-extractive implants (i.e. PEIs) are widely used to reduce surgical steps and improve patient compliance. The aim of this study is to perform a retrospective study on 2,273 PEIs to evaluate their survival rate. In the period between January 2008 and December 2013, 877 patients (498 females and 379 males) were operated at the BDD private Practice Clinic (Milan, Italy). The mean post-surgical follow-up was 30±17 months (max – min, 84 – 1). Two thousand two hundred and seventy-three PEIs (EDIERRE Implant System SpA, Genoa, Italy) were evaluated in the present study. All patients underwent the same surgical protocol and agreed to participate in a post-operative check-up program. SPSS program was used for statistical analysis. Survival rate (SVR) was 97.7% since only 53 fixtures were lost from a total of 2,273 implants. Cross-tabulation between failures and timing of loading demonstrated a statistically significant higher risk of failures in case of immediate loading (p= 0.013). There were 26 failures out of 761 immediate loaded implants against 27 lost fixtures out of 1,485 delayed loaded implants. PEIs is a reliable procedure, however surgeons should carefully select those cases which can be immediately loaded.

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**DISCLOSURE: ALL AUTHORS REPORT NO CONFLICTS OF
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CLINICAL OUTCOME OF 2,560 IMPLANTS AFTER A MEAN OF 30-MONTH FOLLOW-UP

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The advantage of implantology is to replace dental loss with a fixed prosthesis even in cases of partial or total edentulism without damaging the natural teeth. In the period between January 2008 and December 2013, 877 patients (498 females and 379 males) were operated at the BDD private Practice Clinic (Milan, Italy). The mean post-surgical follow-up was 30±17 months (max – min, 84 – 1). Two thousand five hundred and sixty out of 2,657 implants had a complete record and were evaluated in the present study. The implants were of different diameters and length, inserted both in mandible (1,327) and in maxilla (1,233) with immediate or delayed loading, and with graft, split crest, post-extraction, osteo-condensation, small and big sinus lift techniques, respectively. Fifty-nine out of 2,560 implants were lost (i.e. SVR = 97.7%). Cross-tabulation between failures and timing of loading (p= 0.008) had a statistically significant value, with a worse result for immediate loading (28 failures out of 783). In other comparisons between lost implants and diameter (p= 0.074), length (p=0.293), jaws (i.e. maxilla vs mandible, p=0.208), replaced teeth (incisors plus cuspids vs premolars plus molars, p=0.074), insertion torque (p=0.528), surgeons (p=0.452) and additional surgical procedures (i.e. split crest, post-extraction, graft, osteo-condensation, transposition, small and big sinus lift techniques, p= 0.713) no statistically significant difference was detected. EDIERRE Implant System SpA (Genova, Italy) implants have a high SVR (97.7%) allowing more simple surgical procedures for oral rehabilitation of partially or totally edentulous jaws.

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SURVIVAL RATES OF NARROW *VERSUS* STANDARD DIAMETER IMPLANTS IN DIFFERENT TREATMENT OPTIONS: A RETROSPECTIVE STUDY

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Implant dentistry has had a great success in the last decades for replacing missing teeth; however, implant surgery needs bone availability. The use of narrow diameter implants (NDIs) may be an alternative approach in patients with atrophic maxilla or mandible. The aim of this study is to perform a study on NDIs to evaluate their survival rate. In the period between January 2008 and December 2013, 877 patients (498 females and 379 males) were operated at the BDD private Practice Clinic (Milan, Italy). The mean post-surgical follow-up was 30±17 months (max – min, 84 – 1). One thousand three hundred and forty-six implants (EDIERRE Implant System SpA, Genoa, Italy) were included in the present study, 112 (8.3%) 3.3 mm (i.e. narrow) and 1,234 (91.7%) 3.75 mm wide. All patients underwent the same surgical protocol and agreed to participate in a post-operative check-up program. SPSS program was used for statistical analysis. Survival rate (SVR) was 97.25% since only 37 fixtures were lost from a total of 1,346 implants. Cross-tabulation between failure diameter did not demonstrate any statistical differences between narrow and standard diameter implants. NDIs are reliable devices for oral rehabilitation.

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ARE WIDE DIAMETER IMPLANTS RELIABLE FOR JAW'S REHABILITATION? A RETROSPECTIVE STUDY ON 450 IMPLANTS

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The use of wide diameter implants (WDI) have had a great success, particularly in posterior jaws, because WDI can ensure an increased bone-implant contact, better withstanding occlusal forces and creating a wider platform for prosthesis. The aim of this study is to perform a study on 450 WDI to evaluate their survival rate. In the period between January 2008 and December 2013, 877 patients (498 females and 379 males) were operated at the BDD private Practice Clinic (Milan, Italy). The mean post-surgical follow-up was 30±17 months (max – min, 84 – 1). Four hundred and fifty WDI (EDIERRE Implant System SpA, Genoa, Italy) were included in the present study, 326 (72.4%) 4.5 mm and 124 (27.6%) 5 mm. All patients underwent the same surgical protocol and agreed to participate in a post-operative check-up program. SPSS program was used for statistical analysis. Survival rate (SVR) was 97.3% since only 12 fixtures were lost from a total of 450 implants. Cross-tabulation between failures and immediate loading had a statistically significant value ($p= 0.009$) in respect to delayed loading. There were 8 failures out of 128 immediate loaded implants in respect to 4 failures out of 315 delayed loaded fixtures. WDI are reliable devices for oral rehabilitation with high SVR.

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***IN VIVO* CHARACTERIZATION OF ORAL PEMPHIGUS VULGARIS BY OPTICAL COHERENCE TOMOGRAPHY**

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Pemphigus vulgaris (PV) is an autoimmune disease that manifests as intraepithelial blisters in skin and mucous membranes. We report the case of a 62-year-old female patient with clinical picture of desquamative gingivitis and a histological and serological diagnosis of pemphigus vulgaris. The aim of this study is to analyse bullous oral diseases in order to evaluate the feasibility to image epithelial architecture of oral mucosae using *in vivo* optical coherence tomography. Optical coherence tomography seems to be a valid non-invasive auxiliary diagnostic device able to show *in vivo* the epithelial layers and basal membrane.

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RECONSTRUCTION OF THE ZYGOMATIC BONE WITH SMARTBONE®: CASE REPORT

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The repair of complex craniofacial bone defects is challenging and a successful result depends on the defect size, the quality of the soft tissue covering the defect and the choice of reconstructive method. Autologous bone grafts are the gold standard for bone replacement. Tissue engineered constructs are temporary substitutes developed to treat damaged or lost tissue. Recent advances in materials science have provided an abundance of innovations, underlining the increasing importance of polymer in this field. The Galeazzi Orthopedical institute of Milan received a Serbian soldier who reported a deep wound, due to the explosion of a grenade, during former-Yugoslavia's war. His left cheekbone was completely lost, together with the floor of the left eye. SmartBone® technology allowed the realization of custom-made grafts which perfectly fitted the bone defect thanks to mechanical strength, also at small thicknesses, and the ability to be shaped without powder formation or unpredicted fractures. Tissue engineering approaches to regeneration utilize 3-dimensional (3D) biomaterial matrices that interact favorably with cells. The potential benefits of using a tissue engineering approach include reduced donor site morbidity, shortened operative time, decreased technical difficulty of the repair, ability to closely mimic the *in vivo* microenvironment in an attempt to recapitulate normal craniofacial development: this 36-month case study allowed to prove that SmartBone® custom-made bone grafts are an effective solution, gathering such benefits and being available now for daily routine.

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INSULIN ACTIVITY ON DENTAL PULP STEM CELL DIFFERENTIATION: AN *IN VITRO* STUDY

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Insulin is a powerful and important hormone involved in the proliferation and differentiation of osteoblasts. Dental pulp stem cells (DPSCs) have the ability to self-expand and differentiate in pre-osteoblast, producing *in vitro* autologous bone tissue. The aim of our study is to investigate whether insulin can influence differentiation of DPSCs in osteoblast and bone tissue. Dental germ pulp was extracted from third molars of healthy subjects, following informed consent. DPSCs were treated with insulin at the concentration of 100 ng/ μ l for 24 and 48 h. Gene expression in treated DPSCs was compared with untreated cells (control) in order to check the effect of insulin on stem cell differentiation. After 24 h, significant up-regulated genes (Fold change > 2) in DPSCs were the Bone Morphogenetic Proteins BMP3, BMP4 and their receptor BMPR1A. BMP1 results over-expressed after 48 h of treatment. Significantly down-regulated genes were BMP4, BMP7 and TGFBR2 after 24 h of treatment and BMP5 and BMP7 after 48 h. Insulin was demonstrated to influence proliferation of DPSC, differentiation and expansion in osteoblasts. Further studies are needed to explore this new way of creating bone tissue.

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EFFECT OF SOMATOSTATIN ON DENTAL PULP STEM CELLS

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Dental pulp stem cells (DPSCs) are multipotent stem cells with the potential to differentiate into various cell types. For this reason, they have been proposed as an alternative source for mesenchymal stem cells. Somatostatin is a peptide hormone with an inhibitory effect on several endogenous hormones. The aim of our study is to investigate whether somatostatin can promote or inhibit differentiation of DPSCs in osteoblasts and bone tissue. DPSCs were extracted from third molars of healthy subjects, and were treated with somatostatin at the concentration of 100 ng/ml for 24 and 48 h. Gene expression in treated DPSCs was compared with untreated cells (control) in order to check the effect of somatostatin on stem cell differentiation. After 24 h of treatment many genes investigated were down-regulated in treated DPSCs vs untreated DPSCs. Significantly up-regulated gene (Fold change > 2) was the Bone Morphogenetic Protein BMP4. On the contrary somatostatin induced the over-expression of bone related genes after 48 h of treatment (i.e. BMPR1B and BMPR2). TGF β family genes and their receptors were also significantly up-regulated after 48 h of treatment. Somatostatin demonstrated to promote the self-renewal of DPSCs: in our experiments somatostatin mainly acted on TGF β family genes. Further studies are needed to explore this new way of creating bone tissue.

SINGLE APPLICATION OF A DESSICATING AGENT IN THE TREATMENT OF RECURRENT APHTHOUS STOMATITIS

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Recurrent aphtous stomatitis (aphthae, canker sores) is one of the most common and painful oral mucosal inflammatory ulcerative conditions; etiopathogenesis is uncertain and only symptomatic therapy is available. We used a dessicating agent based on a concentrated mixture of sulfates. The rationale for use of this product on canker sores is that it cauterises the epithelial tissue affected by the immune response. The aim of this study was to evaluate the topical application of this dessicating agent on aphtous ulcers, and verify its efficacy in reducing pain. Fifty-seven patients, with oral minor aphtous lesions and a history of recurrent aphtous stomatitis were enrolled into this study and were assigned into two groups: 30 patients were treated with a single topical application of a dessicating agent and 27 without any treatment. A subjective evaluation of symptoms was completed by each patient using a visual analog scale (VAS) of 0-10. Patients' oral lesions were clinically observed at days 0 (before entering the study) and at day 6. We found that from day three the mean differences in pain score between the two groups was about 16.33% with a decrease of symptoms of 49.57% compared with pretreatment VAS score at baseline ($P < 0.001$). Unfortunately, if we compare the mean differences from baseline in the range of 6 days of pretreatment until day 6 in the group treated with the dessicating agent and in the one receiving no treatment, performing an unpaired *t*-test, no significant differences appeared ($P > 0.05$). These data suggest that a single application of this medicament could become a valid support in the management of recurrent aphtous stomatitis.

CRESTAL SINUS LIFT USING A FLUIDO-DYNAMIC COMPUTER GUIDED PRECISE AND ATRAUMATIC TECHNIQUE

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One of the most frequent reasons for failure during the maxillary sinus floor lift operation is connected to the possibility of a rupture of the Schneiderian membrane which, if lacerated, cannot perform the function of graft containment. In order to reduce the incidence of complications it is necessary to cut the hard tissue with extreme accuracy and as little trauma as possible, while saving the soft tissue. The precision of pre-operation measures obtained through endoral x-rays, dental-scans and cone-beam CT allows us to approach and cut with delicacy the sinus cortical floor. The recent development of computer guided surgery gives the possibility of planning the operation, which reduces the risk of failure. The cortical of the maxillary sinus is reduced through the use of calibrated burs and a profiler to obtain a hole that enables both access to the maxillary sinus and, subsequently, the lifting of the Schneiderian membrane. Each stage of the operation is monitored and all the devices used pass through a custom-made template, which acts as a surgical guide. The sinus was filled using fluid biomaterial distributed through a dispenser, which had been created specifically for this technique. Due to the reduction in trauma and the fact that the process is much less invasive, this technique could be a valid alternative to the techniques known and carried out to date. Work time is reduced to less than 3 minutes in the cortical thinning operation and percussive trauma is avoided.

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STRAIN ANALYSIS OF MASSETER MUSCLE BY ULTRASOUND

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The masseter muscle represents an area of important functional interest. The present study aims to verify the feasibility of ultrasound imaging for quantifying the muscular deformation pattern in the masseter. Fifteen consecutive subjects were enrolled and underwent masseter ultrasound according to a repeatable protocol. Ultrasound was carried out during teeth clenching in natural conditions and after the insertion of a medical device that alters the distance between the dental arches, and was repeated on 3 different days. Results showed that masseter deformation is not uniform within the muscle. The same strain patterns were repeated in the different ultrasounds of the same patient and were modified after the introduction of a medical device. This was supported by quantitative comparisons in the deep portion of the muscle (standard deviation on the three measures: 3% normal conditions, 2% with medical device) showing a systematic reduction with the prosthesis (30% on average). This study demonstrated that masseter strain analysis is a repeatable and sensitive tool for the study of functional analysis of the masticatory organ. This opens new technical perspectives for the diagnosis and therapy of dysfunctional pathologies of the masticatory organ.

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***IN VITRO* ANALYSIS OF MARGINAL ADAPTATION AND RESISTANCE OF DIFFERENT DENTAL COMPOSITES: STEREO AND SCANNING ELECTRON MICROSCOPIC EVALUATION**

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To compare the performance, by scanning electron microscopic analysis, of the interface between tooth and four commercial restorative composite resins in Class I cavities following exposure to acidified artificial solution, pH 4.5, with a background electrolyte composition similar to saliva, 600 teeth were divided into 4 groups. The first group was treated with microfilled light-cured Heliomolar; the second group with Durafill; the third group with the microfilled self-cured Isomolar; and the fourth group was treated using the hybrid self-cured Miradapt. All teeth of each group were randomly divided into two sub-groups: A) a control group that was immersed in artificial saliva (pH 7); B) a study group that was immersed in artificial saliva acidified with phosphoric acid (pH 4.5) in order to obtain artificial caries. The samples were examined by scanning electron microscopy. Data were analyzed using Pearson's *Chi-squared* test (χ^2) with R statistical software. The statistical analyses demonstrated significant differences in the two sub-groups A and B when considered for the light-cured composites whereas no difference was monitored for self-cured composites. Statistical analysis ($p < 0.001$) also demonstrated that the type of composite strongly influenced the infiltration grade. Our results demonstrate that incremental layering techniques might improve the marginal adaptation for light-cured composites, while self-cured show a marked polymerization contraction which can cause marginal breakdown.

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CDH1 POLYMORPHISMS AND LOW EXPRESSION OF E-CADHERIN AND β -CATENIN IN COLORECTAL CANCER PATIENTS

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Epithelial-mesenchymal transition (EMT) process has a central role in tumor progression and metastases. Loss of cell-to-cell adhesiveness is a key step in EMT. In particular, E-cadherin and β -catenin, components of the adherens junctions, play a strategic role. Accumulation of β -catenin at cytoplasmic level following adherens junctions disruption, induces its translocation into the nucleus, where it binds to members of the TCF/LEF family of transcription factors. In particular, Lymphoid Enhancer-Binding factor 1 (LEF1) product can target genes involved in EMT. The aim of the present study was to evaluate the influence of CDH1 and CTNNB1 genes, coding for E-cadherin and β -catenin respectively, and LEF1 in a sample study of 140 Italian patients affected by colorectal cancer. An association study between four single nucleotide polymorphisms (rs11865026, rs11642413, rs13689, and rs10431923) of CDH1 and the disease did not provide statistically significant results. The gene expression analysis carried out for CDH1, CTNNB1 and LEF1 in 54 paired specimens from 27 patients provided evidence of a reduced expression of the first two in cancer tissues. We believe there may be a sort of cross regulation between the products of these two genes which closely interact in EMT activation and that such hypothesis should be further investigated in a greater number of cases.

REGENERATION OF ATROPHIC CRESTAL RIDGES WITH RESORBABLE LAMINA: TECHNICAL NOTE

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Several techniques have been proposed to increase the mandibular bone base, both horizontally and vertically, for implant purposes in atrophic distal ridges. Block graft and titanium grids are frequently used for this purpose. The former need to be fixed, in the case of an autologous bone block require a donor site graft, and if not kept sufficiently vascularized could result in necrosis. The latter are manageable with difficulties in the event of exposure and are removed with difficulty. In this work a technique is proposed which makes use of resorbable cortical lamina in order to create recipient sites which can be filled with prehydrated and collagenated granules covered by mesenchymal resorbable membranes. We demonstrated with this technique the good vascularization of the graft combined with the integration of the lamina, which do not need to be removed. Our results allow us to propose this technique as a potential alternative to those used to date.

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QUANTITATIVE ANALYSIS OF PERIODONTAL PATHOGENS IN PERIODONTITIS AND GINGIVITIS

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Periodontal tissues surround the teeth and provide their attachment. Periodontal diseases include a mild and reversible form named gingivitis, and periodontitis that is the main cause of tooth loss in adults. Gingivitis, that affects gums and coronal junctional epithelium, as well as periodontitis, that is characterized by loss of connective tissue attachment, are caused by a persistent inflammatory response promoted by alteration of periodontal biofilm. The aim of the study was to test whether the prevalence or relative amount of each species was associated with a particular clinical condition. Periodontal evaluation of 539 unrelated patients was performed by the Periodontal Screening and Recording (PSR) system. Subgingival samples were obtained from the site with the worst PSR score. A selection of eleven bacterial species was evaluated by quantitative real time PCR. Some bacterial species were found to be associated with all phases of periodontal disease, such as *Tannerella forsythia*, *Treponema denticola*, and *Treponema lecithinolyticum*, while other species were more specifically associated with periodontitis, such as *Porphyromonas endodontalis* and *Porphyromonas gingivalis*, or with gingivitis, such as *Capnocytophaga ochracea* and *Campylobacter rectus*. Quantitative and qualitative analyses helps to better understand the microbial changes associated with different stages of periodontal disease.

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INTERLEUKIN-6 GENE POLYMORPHISM MODULATES THE RISK OF PERIODONTAL DISEASES

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Gingivitis and periodontitis are the two main periodontal diseases. Both are characterized by inflammation of the tissues surrounding the teeth but while tissue damages observed in gingivitis are mild and reversible, destruction caused by periodontitis is deeper and irreversible. Periodontal diseases and levels of degeneration of tissues surrounding teeth depend on several interacting endogenous and exogenous factors. Polymorphisms of genes encoding molecules that modulate the immune response and tissue homeostasis are the main causes of individual susceptibility to periodontal diseases. The aim of this study was to investigate IL6, IL10 and VDR gene polymorphisms in a large number of subjects affected by either gingivitis or chronic periodontitis. The sample included 750 Italian patients. We found that the rs1800795 SNP located in the IL6 gene promoter was strongly associated with the occurrence of both gingivitis and periodontitis. Indeed, homozygous individuals with variant allele appeared less-susceptible to both gingivitis OR=0.47 (95% C.I. 0.27-0.82) and periodontitis OR=0.36 (95% C.I. 0.21-0.64). No evidence of association between periodontal diseases and IL10 or VDR polymorphisms was obtained. This data confirmed the role of IL6 in susceptibility to periodontitis among the Italian population. The evidence that IL6 polymorphisms are also involved in gingivitis has implications in periodontal disease pathogenesis and reduces the appeal of IL6 as a periodontitis biomarker.

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E-CADHERIN CODING GENE (*CDH1*) AND NONSYNDROMIC CLEFT LIP WITH OR WITHOUT CLEFT PALATE: IS THERE ANY ASSOCIATION?

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Epithelial to Mesenchymal Transition (EMT) is an important process involved in cancer, embryogenesis and organ development. Its role in nonsyndromic cleft lip with or without cleft palate (NSCL/P) has been extensively investigated and successfully linked to the disease. In this study, we focused on a gene, *CDH1*, encoding for E-cadherin, a key protein in EMT. We carried out an association study on an Italian sample group, genotyping four single nucleotide variations within the *CDH1* gene, in order to verify the potential role of this gene in NSCL/P etiology. Neither the haplotype nor the family-based association test revealed any association between the genotyped SNPs and the pathology. Our results demonstrate that, in our Italian sample study, the analyzed single nucleotide polymorphisms are not associated to NSCL/P.

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PERIODONTAL POCKETS AS A RESERVOIR OF *HELICOBACTER PYLORI* CAUSING RELAPSE OF GASTRIC ULCER: A REVIEW OF THE LITERATURE

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Helicobacter pylori (HP) is one of the most common gastric infections in the world, affecting about half the world's population, and is the principal cause of adenocarcinoma of the distal stomach. It seems that HP infects the subject early in life and is transmitted from person to person. The HP reaches the stomach through oral ingestion, and because of its non-invasive nature, the stomach is the ultimate site of colonization. Recently, it has been debated whether the oral cavity is a reservoir of HP bacteria participating in infection transmission, or representing a nidus of re-infection after eradication of the bacterium. HP and recurrent aphthous stomatitis (RAS) show similar clinical and histological findings, and the discovery of HP in RAS ulcers support the idea of a correlation between the two diseases. Another important relationship between RAS and HP is the high incidence of anemia in patients with RAS that may be caused by HP-positive stomach disease. In fact, antibiotic therapy and treatment of anemia can reduce the frequency of RAS ulcer recurrence. HP is considered a carcinogenic agent type 1 of the stomach by the International Agency for Research on Cancer. In conclusion, the oral cavity is an extra-gastric reservoir of HP and periodontal therapy associated with systemic therapy can better eradicate HP from the mucosa of all gastro-enteric tract, reducing relapse of HP infection. Prospective cohort studies are needed to demonstrate the bacterial action in the oral cavity.

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EVALUATION OF THE EFFICACY OF TITANIUM DIOXIDE WITH MONOVALENT SILVER IONS COVALENTLY LINKED (TIAB) AS AN ADJUNCT TO SCALING AND ROOT PLANING IN THE MANAGEMENT OF CHRONIC PERIODONTITIS USING PCR ANALYSIS: A MICROBIOLOGICAL STUDY

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The use of chemical devices for non-surgical periodontal therapy has led to new treatment strategies aimed primarily at controlling infection. Over the last few years, titanium dioxide (TiO₂) with monovalent silver ions (A) covalently linked and added to benzalkonium (B) (named TIAB) has been subjected to medical studies, especially in dermatology. The purpose of the present study was to assess the effect of TIAB on the red complex bacteria using Polymerase Chain Reaction (PCR) for microbiological analysis. A split mouth study was conducted, and 10 subjects were enrolled. TIAB as topical medication was placed at study sites after scaling and root planing. Sub-gingival plaque samples were collected after 2 weeks, and red complex micro-organisms were studied using PCR. SPSS program was used for statistical purposes and a paired sample correlation was performed at the end of the observation period between treated and untreated sites. The results showed statistically significant reduction of red complex organisms in the study compared to the control group. TIAB can be used as an effective local drug along with supportive periodontal therapy in treatment of chronic periodontitis.

POLYMERASE CHAIN REACTION TO EVALUATE THE EFFICACY OF SILICA DIOXIDE COLLOIDAL SOLUTIONS IN THE TREATMENT OF CHRONIC PERIODONTITIS: A CASE CONTROL STUDY

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The objective of this study was to compare the efficacy of supportive periodontal therapy [i.e. scaling and root planing (SRP)] alone versus a chemical silica dioxide (SiO₂) colloidal solution (SDCS) device used in association with SRP in the treatment of chronic periodontitis in adult patients. A total of 20 patients with a diagnosis of chronic periodontitis (40 localized chronic periodontitis sites) in the age group of 35 to 55 were selected. None of these patients had previously received any surgical or non-surgical periodontal therapy and had radiographic evidence of moderate bone loss. Two non-adjacent sites in separate quadrants were selected in each patient to monitorize treatment efficacy (split mouth design). Clinical pocket depth (PD) and microbial analysis (MA) were analyzed at baseline and on 15th day. SPSS program and paired simple statistic *t*-test were used to detect significant differences. Total bacteria loading, *Tannerella forsitia* and *Treponema denticola* loading were statistically reduced when SiO₂ was locally delivered. SDCS gel is an adjuvant therapy which should be added to SRP in the management of moderate-to-severe chronic periodontitis.

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COMPOSITE POLYMER-COATED MINERAL SCAFFOLDS FOR BONE REGENERATION: FROM MATERIAL CHARACTERIZATION TO HUMAN STUDIES

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Bovine bone xenografts, made of hydroxyapatite (HA), were coated with poly(L-lactide-co-ε-caprolactone) (PLCL) and RGD-containing collagen fragments in order to increase mechanical properties, hydrophilicity, cell adhesion and osteogenicity. *In vitro* the scaffold microstructure was investigated with Environmental Scanning Electronic Microscopy (ESEM) analysis and micro tomography, while mechanical properties were investigated by means compression tests. In addition, cell attachment and growth within the three-dimensional scaffold inner structure were validated using human osteosarcoma cell lines (SAOS-2 and MG-63). Standard ISO *in vivo* biocompatibility studies were carried out on model animals, while bone regenerations in humans were performed to assess the efficacy of the product. All results from *in vitro* to *in vivo* investigations are here reported, underlining that this scaffold promotes bone regeneration and has good clinical outcome.

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HYALURONIC ACID IN DERMAL REJUVENATION: AN *IN VITRO* STUDY

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The purpose of this paper is to evaluate the role of hyaluronic acid in bio-revitalization by testing several extracellular matrix biological parameters in cultured dermal fibroblasts. To this aim, fibroblastic expressed genes after exposition to three hyaluronic acid medical devices were evaluated. Cells were seeded on a layer of three different medical devices containing 6.2, 10 and 20 mg/ml of hyaluronic acid for 24 h. Real Time Polymerase Chain Reaction was performed to investigate gene expressions. Genes encoding hyaluronic acid synthesis and degradation, Metalloproteinases 2 and 3 and Desmoplakin production as well as GDF6, and IGF1 were activated by hyaluronic acid products. The *in vitro* study showed similar effects on tested genes despite a different concentration of hyaluronic acid contained in the medical devices and the simultaneous presence of other additives. Based on the reported data, gene activations are an aspect of metabolic modulation of signalling pathways rather than the proportional production of a specific connective tissue molecule. Indeed different hyaluronic acid concentration and the presence of other additives did not change the overall effect on the studied genes. We believe that the optimization of extracellular matrix micro-environment, obtained by enhanced structural support with hyaluronic acid, leads to functional and metabolic improvement.

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THE THEORIES OF AGING: REACTIVE OXYGEN SPECIES AND WHAT ELSE?

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This manuscript is a short review on the theories of aging, focusing mainly on the balance between the nutrient and the oxygen intake necessary for energy metabolism and the processes for neutralizing the negative consequences of energy production. The first section entitled “Why” provides brief historical details regarding the main group of aging theories, firstly the evolutionary theories and secondly the theories of aging related to humans, cells and biomolecules are discussed. The second section entitled ‘Where’ includes brief summaries of the many cellular levels at which aging damage can occur: replicative senescence with its genetic and epigenetic implications, cytoplasmic accumulation, mitochondrial respiratory chain dysfunction, peroxisome and membrane activity. In the third section entitled ‘How’ the linking mechanisms between the caloric restriction and the antioxidant intake on lifespan and aging in experimental models are discussed. The role of ROS is evaluated in relation to the mitochondria, the AMPK activated sirtuins, the hormesis, the target of rapamicin and the balance autophagy/apoptosis.

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NONSURGICAL PERIODONTAL MANAGEMENT OF IATROGENIC PERI-IMPLANTITIS: A CLINICAL REPORT

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Dental implants have emerged as a first line of treatment to replace missing teeth for both the edentulous and partially dentate patients. The anticipated high degree of success is somewhat challenged by the onset of peri-implantitis. Peri-implant diseases are a cluster of “contemporary” oral infections in humans; they are characterized by the inflammatory destruction of the implant-supporting tissues, as a result of biofilm formation on the implant surface. It is still not clear how the roles of its etiologic agents work. A history of periodontitis, poor oral hygiene, and smoking are considered as risk factors for peri-implant diseases. Occasionally failing implants are associated with iatrogenic factors, that, only recently, have been acknowledged as direct cause of peri-implant complications, i.e.: non-parallel adjacent implants or the presence of a gap, between fixture and prosthetic components. The use both of traditional protocols of nonsurgical periodontal therapy and the diode laser seems to be an effective alternative treatment modality for peri-implantitis. By the application of laser-assisted non-surgical peri-implant therapy the periodontal pocket depth was reduced. Intraoral periapical radiographs, taken at 6 months and 1 year post nonsurgical treatment, seemed to provide evidence of some improvement of the bone level. The present article illustrates the nonsurgical management of one case, where failure to remove residual cement, from an implant-supported dental prosthesis, seemed to cause peri-implant inflammation.

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