

A PROSPECTIVE EVALUATION OF OUTCOMES OF TWO TAPERED IMPLANT SYSTEMS

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The purpose of this prospective clinical study was to evaluate survival rate (SVR - i.e. fixtures still in place at the end of the observation period) and success rate (SCR - i.e. bone resorption around the implant neck) of two tapered implant systems. Both systems were equipped with a tapered connection, one requiring bone-level (BL) placement, while the other required soft-tissue-level (STL) placement. In the period between January 1996 and October 2011, 133 fixtures were inserted, 90 in females and 43 in males, with a mean age of 60±11 years. The mean post-surgical follow-up was 64±38 months. Several clinical parameters were evaluated as potential outcome conditioners. An SPSS program was used for statistical analysis and a Cox analysis was performed. The SVR was 100% since no fixtures were lost. SCR, expressed through the mean marginal bone loss, was 88%. No significant differences were found, for most of the variables investigated with the exception of bone grafting and implant type: STL implants showed a better clinical outcome than BL implants when bone grafting was performed simultaneously with implant placement. Tapered implants are reliable devices for oral rehabilitation of jaws.

0393-974X (2016)

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CLINICAL OUTCOME OF A TWO-PIECE IMPLANT SYSTEM WITH AN INTERNAL HEXAGONAL CONNECTION: A PROSPECTIVE STUDY

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The purpose of this prospective clinical study was to evaluate the survival rate (SVR - i.e. fixtures still in place at the end of the observation period) and success rate (SCR - i.e. bone resorption around implant neck) of an implant system characterized by cylindrical and tapered implants, both provided with an internal hexagonal connection. In the period between January 1996 and October 2011, 52 implants with internal hexagonal connection were inserted in 21 females and 31 males, mean age 54 ± 11 years. The mean post-surgical follow-up was 44.6 ± 34.4 months. Several parameters were evaluated as potential outcome conditioners: age, gender, smoking, replaced tooth, periodontal disease, fixture shape (i.e. cylindrical or tapered), jaw location (i.e. maxilla or mandible), bone graft, immediate loading, post-extractive placement, type of prosthesis (i.e. single crown or bridge), edentulism, implant diameter and length. An SPSS statistical program was used and Cox regression analysis performed. SVR was 100% since no fixtures were lost. SCR, expressed through the mean marginal bone loss, was 77%. No significant differences were found, for most of the parameters analyzed, with the exception of prosthetic bridges, where implants supporting this type of rehabilitation showed a worse clinical outcome in comparison to single crown rehabilitations. Internal hexagonal connection is a reliable tool for oral rehabilitation.

**MAXILLARY SINUS BY-PASS WITH TILTED IMPLANTS VIA
TAPERED-SCREW BONE EXPANDERS IN LOW DENSITY BONE:
ONE YEAR FOLLOW-UP OF A CASE SERIES**

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In the present paper the use of tapered-screw bone expanders (TSBEs) is proposed, in combination with the placement of tilted implants in close proximity to the anterior sinus wall, solving the problem of the reduced height of the alveolar bone in the sub-antral area. The Authors named the procedure: Tilted Implant Expansion Osteotomy (TIEO). Fifteen patients (10 females and 5 males, mean age 47.8±8.15 years) with distal edentulous maxillae were enrolled in this study. For each edentulous site 2 implants were placed, the anterior implant in the area of the most anterior missing tooth while, the posterior implant, immediately in front of the maxillary sinus, with an inclined position. Adopting the aforesaid procedure, 34 cylindrical two-piece implants were placed, 17 of which were placed in tilted position, in order to by-pass the maxillary sinus. After a healing period of 4-6 months, the second stage surgery was performed. The cases were finalized by metal-ceramic cementable restorations with a variable number of elements, from 2 to 4, without any cantilever element. The post finalization follow-up was at 12 months. Survival rate was 100% since no fixtures were lost. At the one-year follow-up the clinical and radiological appearance of the soft and hard tissues was optimal and no pathological signs were recorded. TIEO is a promising surgical procedure for oral rehabilitation of maxillary edentulous sites and represents a therapeutic alternative to sinus lift techniques.

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ENDOSCOPICALLY CONTROLLED HYDRAULIC SINUS LIFT IN COMBINATION WITH ROTARY INSTRUMENTS: ONE YEAR FOLLOW-UP OF A CASE SERIES

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The aim of this study was to evaluate a sinus lift via crestal approach (SLVCA) case series, performed with rotary instruments and hydraulic pressure, analyzed under endoscopic control. Sixteen patients (11 female, 5 male, mean age 47.13±8.07 years) candidates for SLVCA were enrolled in this study. Twenty-two cylindrical two-piece implants were placed. After a suitable period of time needed for the consolidation of the graft (mean value 5.78±1.49 months), the bone augmentation was assessed by means of intraoral X-ray exams before the surgical procedure of re-entry. After a functional load with temporary acrylic fixed prosthesis, on Peek abutments, for a span of 4 months, the cases were finalized with cemented metal-ceramic prosthesis (10 single crowns, 6 bridges). The post finalization follow-up was at 12 months. During the perforation of the sinus floor via rotary instruments no perforations of the sinus membrane were observed either during the hydraulic detachment or simultaneous filling of the subantral space with the graft material. Survival rate was 94.5% since one fixture was lost, but immediately replaced with a new one. At the one-year follow-up the clinical and radiological appearance of the soft and hard tissues was optimal and no pathological signs were recorded. The SLVCA performed with rotary instruments and hydraulic pressure is a reliable grafting procedure for oral rehabilitation of maxillary edentulous sites.

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GUIDED BONE REGENERATION BY MEANS OF A PREFORMED TITANIUM FOIL: A CASE OF SEVERE ATROPHY OF EDENTULOUS POSTERIOR MANDIBLE

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The aim of this case report was to evaluate the potential of preformed titanium foil (PTF) as membrane, used together with a mouldable allograft paste, for guided bone regeneration in a case of severe mandibular posterior atrophy involving the alveolar nerve. In order to create a rigid barrier to the competitive growth of soft tissues and a stable volume for the colonization of the osteoprogenitor cells, a foil of pure titanium was pre-shaped by means of a stereolithographic model, obtained from a CT-scan of the patient. This procedure showed promising results, allowing to maximize the outcome and simplifying the surgical phase.

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RETROSPECTIVE STUDY ON BONE-LEVEL AND SOFT-TISSUE-LEVEL CYLINDRICAL IMPLANTS

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The purpose of this prospective clinical study was to evaluate the survival rate (SVR - i.e. fixtures still in place at the end of the observation period) and success rate (SCR - i.e. bone resorption around implant neck) of two cylindrical implant systems. Both systems were equipped with a tapered connection, one requiring a bone-level (BL) placement, while the other a soft-tissue-level (STL) placement. In the period between January 1996 and October 2011, a total of 150 implants (76 in females and 74 in males, mean age 60 ± 11 years) were inserted. The mean post-surgical follow-up was 84 ± 47 months. Several parameters were evaluated as potential outcome conditioners: age, gender, diabetes, smoking, periodontitis, type of edentulism, replaced tooth, jaw location (i.e. maxilla or mandible), bone graft, immediate loading, post-extractive, type of prosthesis, implant diameter and length. An SPSS program was used for statistical analysis. Only two fixtures were lost, therefore SVR was 98.7%. SCR, expressed through the mean marginal bone loss, was 92%. The mean peri-implant bone loss was 0.121.47 mm for BL implants and 0.041.3 mm for STL implants. None of the studied variables had a statistical significant impact on SVR or SCR. Cylindrical implants are reliable for oral rehabilitation.

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**THE INFLUENCE OF “CONICAL PLUS OCTAGONAL”
INTERNAL CONNECTION ON IMPLANT SURVIVAL AND SUCCESS RATE:
A RETROSPECTIVE STUDY OF 66 FIXTURES**

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Implant oral rehabilitation has become one of the most successful dentistry techniques over the last 30 years. However, peri-implantitis is the most important complication in implant dentistry. Peri-implantitis can be caused by inadequate implant-abutment connections (IAC). The aim of our study is to evaluate the influence of “conical plus octagonal” (i.e. I-Fix connection) on implant survival and success rate. All the implants included in this study were of a completely new type (I-Fix implants and abutments by FMD Falappa Medical Devices S.p.A. Rome, Italy). Sixty-six implants were inserted in males and females. The implants were of different diameters and lengths, inserted both in the mandible and in the maxilla with immediate or delayed loading, with guided bone regeneration (GBR), and post-extractive surgery. All implants were provided with I-Fix connection, 64 abutments using passing screws and 2 using full screws. None of the 66 implants were lost (i.e. survival rate - SVR = 100 %). Cox-regression analysis demonstrated that diabetes (p=0.0074), GBR (p=0.0115), maxilla (p=0.0117) and smoking (p=0.0194) have a statistical significant impact on clinical outcome (i.e. greater bone resorption around implant neck). Our data show that I-Fix connection did not influence SVR. This finding demonstrates that I-Fix design seemed to significantly affect the survival rate of the implants in a recent meta-analysis. In spite of the limits of our study, I-Fix connection has been demonstrated to be efficient in closing the gap between implant and abutment and maintaining a good connection over time.

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CLINICAL OUTCOME OF 215 TRANSMUCOSAL IMPLANTS WITH A CONICAL CONNECTION: A RETROSPECTIVE STUDY AFTER 5-YEAR FOLLOW-UP

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The purpose of this retrospective clinical study was to evaluate the survival rate (i.e. SVR - fixtures still in place at the end of the observation period) and success rate (i.e. SCR - bone resorption around implant neck) of an implant system characterized by cylindrical and tapered implants, both types of implant being equipped with a conical connection with an internal octagon (COC), both implant types having a 1.8 mm smooth neck, positioned above the bone crest level. A total of 65 subjects received 215 COCs between January 1996 and October 2011. All COCs were placed and restored by three experienced dental surgeons. The mean follow-up was 84±44 months. The patients involved in the study were both male (30) and female (35), of whom 30 were smokers (less than 20 cigarettes/day) and none was diabetic. The implants differed in terms of diameter and length, and were inserted both in the mandible (97) and in the maxilla (118). Sixty-seven implants were single tooth rehabilitations, and 148 prosthetic bridges. Fourteen had guided bone regeneration (GBR), and 10 were placed in post-extractive sites. Forty of the implants were provided with passing-screw abutments and 175 with full-screw abutments. The data were analyzed using descriptive statistics. None of the implants failed before prosthetic restoration, resulting in an SVR = 100% after loading. The radiographic and clinical data revealed well-maintained, hard and soft tissue around the COCs, with an SCR = 92.6%. Cox regression analyses did not detect any variables with statistical impact on the clinical outcome. In conclusion, Shiner XT implants are reliable tools for oral rehabilitation.

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GUIDED BONE REGENERATION IN DISTAL MANDIBULAR ATROPHY BY MEANS OF A PREFORMED TITANIUM FOIL: A CASE SERIES

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The aim of this case series was to evaluate the clinical outcome of preformed titanium foil (PTF) to perform guided bone regeneration (GBR) in posterior mandibular atrophies. Thirteen patients (4 male; 9 female; mean age 58.85 ± 10.16 years), with class II division C atrophy, according to Misch, were selected to perform GBR by means of PTF, using a moldable allograft paste as graft material. The devices, made of a 0.2mm thick pure titanium foil, were pre-shaped using stereolithographic models obtained from CT-scan of the patients' recipient sites. In the second stage, performed at 6.35 ± 2.15 months, 23 cylindrical two-piece implants were placed and the devices removed. At four months, the implants were exposed and submitted to progressive prosthetic load for a span of 4 months. The cases were finalized by means of metal-ceramic cementable restorations. The post finalization follow-up was at 12 months. Survival rate (i.e. SVR) was 100% since no fixtures were lost. At the one-year follow up, the clinical appearance of the soft tissues was optimal and no pathological signs on probing were recorded. The success rate (i.e. SCR) was 82.6% and the average peri-implant bone reabsorption was 0.99 ± 0.59 mm. The results suggest good potentialities of this method for bone volume augmentation in distal mandibular atrophies, allowing to maximize the outcome and simplifying the surgical phase.

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PREVENTION OF BACTERIAL LEAKAGE AT IMPLANT-ABUTMENT CONNECTION LEVEL: AN *IN VITRO* STUDY OF THE EFFICACY OF THREE DIFFERENT IMPLANT SYSTEMS

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Peri-implantitis is the main cause of implant failures. Peri-implantitis is provoked by the presence of bacterial infiltration around Implant-Abutment Connection (IAC). Reduction of bacterial leakage may be achieved by improving the accuracy and precision of the two pieces of IAC. The aim of the present *in vitro* study was to evaluate bacterial microleakage from the inside to the outside of the IAC, testing the efficacy of three new designs of internal conical connection (FN - nano-fix -, NQ - uNiQo - and Elisir implant systems by FMD, Rome, Italy). To identify the efficacy of three new IAC, the passage of genetically modified *Escherichia coli* across IAC was evaluated. A total of 17 implants were used (5 FN, 6 NQ and 6 Elisir). All implants were immersed in a bacterial culture for 48 h and bacteria amount was then measured inside and outside IAC with Real-time PCR. Bacterial quantification was performed by Real-Time Polymerase Chain Reaction using the absolute quantification with the standard curve method. In all the tested implants, bacteria were found in the inner side, with a median percentage of 1.9% FN, 1.4% NQ and 2.6% Elisir. The analysis revealed that in both cases (internally and externally), bacteria grew in the first 48 hours but subsequently started to die, probably due to nutrient consumption. Of the three, the most efficacious connection was NQ. Within the limitations of this study, it was concluded that the best implant connection reducing bacterial leakage at IAC level was NQ (NQ implant system by FMD, Rome, Italy).

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THE USE OF RESORBABLE HETEROLOGOUS CORTICAL LAMINA AS A NEW SINUS LIFT FLOOR: A TECHNICAL NOTE

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Some graft materials such as a heterologous porcine cortical lamina have an excellent capacity in creating recipient sites that can be filled with cortico-spongy collagenated bone paste that reabsorbs, allowing for the reformation of good-quality bone. In this work a technique is proposed which makes use of resorbable cortical lamina in order to create a new sinus floor that can be filled with cortico-spongy bone paste. The adequate vascularisation of the graft combined with the integration of the lamina, which does not need to be removed, makes it possible to propose this technique as a potential alternative to those used so far.

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THE USE OF RESORBABLE CORTICAL LAMINA AND MICRONIZED COLLAGENATED BONE IN THE REGENERATION OF ATROPHIC CRESTAL RIDGES: A SURGICAL TECHNIQUE. CASE SERIES

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Some graft materials, such as micronized and collagenated bone, have an excellent capacity to be reabsorbed, allowing for the reformation of good-quality bone, but do not have the mechanical characteristics that would allow for stability in terms of shape and size. In this study, a technique is proposed which makes use of resorbable cortical lamina in order to create recipient sites that can be filled with micronized collagenated bone paste. The adequate vascularization of the graft combined with the integration of the lamina, which does not need to be removed, makes it possible to propose this technique as a potential alternative to those used to date.

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OXYGEN HIGH LEVEL LASER THERAPY IS EFFICIENT IN TREATMENT OF CHRONIC PERIODONTITIS: A CLINICAL AND MICROBIOLOGICAL STUDY USING PCR ANALYSIS

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In periodontology, lasers have been suggested for the photodynamic therapy (PDT). Such therapy can be defined as the inactivation of cells, microorganisms or molecules induced by light and not by heat. The aim of our study is to assess the effect of Oxygen high-level laser therapy (OHLLT) in removing all bacterial deposits on root or implant surface by means of mechanical instrumentation and laser irradiation. OHLLT has two effects on targeted bacteria and tissues, decontamination and biostimulation. A total of 33 patients were randomly selected with a diagnosis of chronic periodontitis. The patients enrolled were 16 females and 17 males, six smokers and 4 diabetic patients. For each patient a periodontal charting was performed, assessing probing depth, plaque index and bleeding on probing at baseline and after 6 months. Microbiological analysis were performed with PCR Real Time, using paper tips to withdraw gingival fluid in periodontal pockets before and after treatment, at baseline and after 6 months. All patients were treated with OHLLT at baseline, after 1 week, after 2 weeks and every month for 6 months. After 6 months, all periodontal pockets were treated successfully, without complications and no significant differences in results. All clinical parameters showed an improvement, with a decrease both of plaque index (average decrease of 75%), bleeding on probing (average decrease of 62%) and probing depth (average decrease of 1.8 mm). After the treatment, a remarkable decrease in bacteria amount, both for each species and for total bacteria was observed except for *Aggregatibacter actinomycetemcomitans* and *Porphyromonas gingivalis* demonstrating that this laser protocol is effective on periodontitis treatment. OHLLT is efficient in treatment of chronic periodontitis as demonstrated by clinical and microbiological parameters, going beyond the traditional periodontal therapy.

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EFFECTS OF LASER BIOSTIMULATION ON THE EPITHELIAL TISSUE FOR KERATINIZED LAYER DIFFERENTIATION: AN *IN VITRO* STUDY

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Gingival augmentation techniques proposed in the international literature do not exclude a surgical component, which determines consequent post-surgical discomfort and results are not always predictable. In recent years, the introduction of laser biostimulation has led to a less invasive approach, particularly in the treatment of periodontally compromised patients, limiting the surgical phase to seriously compromised cases, with regeneration techniques for the restoration of a correct periodontal tissue anatomy. The aim of this *in vitro* study is to establish the validity of laser biostimulation in order to develop the epithelial keratinized layer of the tissue by stimulating fibroblasts-keratinocytes organotypic cultures and fibroblasts and keratinocytes mono-cultures. We created two groups (test and control), each one composed of 3 fibroblast cultures, 3 keratinocyte cultures and 3 organotypic cultures. We performed laser irradiation of test group with Wiser Doctor Smile Lambda, Flat Top Handpiece, at 50 J/cm² of fluency with one application every 40 h for a total of 5 applications. Forty-eight h after the last laser application, we investigated the presence and amount of keratins 5 and 8 with citofluorimetric and western blotting analyses. Analyses showed an increase in keratin synthesis in test group cultures, showing a remarkable increase in production of keratin 8 in co-cultures test. Laser biostimulation can considerably enhance keratin synthesis when applied with high energy doses and repeated applications to keratinocytes-fibroblasts co-cultures.

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LOW LEVEL LASER THERAPY AND INVISIBLE REMOVAL ALIGNERS

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It seems that Low Level Laser Therapy (LLLT) stimulates orthodontic tooth movements, increasing the alveolar bone turnover. The aim of this study is to evaluate how LLLT can influence the orthodontic treatment with invisible removal aligner. A sample of 21 subjects was divided into two groups, a laser group (10 patients) and a control group (11 patients). All subjects were instructed to wear each aligner 12 hours a day for 2 weeks. Laser external bio-stimulation was given in the laser group every second week. The laser group successfully finished the treatment, while at 3rd – 5th aligner the control group did not finish the treatment. Laser treatment seemed to be better than treatment without laser. LLLT combined with aligners is able to favour, in 12 hours, the same tooth movement obtained by wearing the aligner 22 hours a day, according to the traditional protocol. This aspect could be useful for those patients who prefer not to use the aligners during the day. LLLT makes invisible removal aligner treatment more comfortable also because during the day the patients have to wear the aligners less hours than the treatment without laser.

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CORRELATION BETWEEN DYSFUNCTIONAL OCCLUSION AND PERIODONTAL BACTERIAL PROFILE

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The aim of this study is to compare the evolution in bacterial profile at evident periodontitis sites following two types of treatment - oral hygiene procedures alone (Group 1) and oral hygiene plus occlusal adjustment through selective grinding (Group 2). The presence of periodontal disease was ascertained by clinical examination (redness, oedema, probe depth, bleeding-on-probing). Bacterial profiling was carried out via phase contrast microscopy on plaque samples taken from periodontitis sites in both patient groups. Bacterial populations were characterized in terms of coccus content before (T0) and at monthly intervals after treatment (T1-6) over a period of six months. Static and dynamic occlusion was evaluated only in Group 2 patients. Whereas the poor pre-treatment bacterial profile was re-established progressively over the evaluation period in Group 1 patients, coccus populations flourished in Group 2 patients, reaching healthy levels (>70%) two months after occlusal adjustment, and clinical examination confirmed an absence of periodontal inflammation in these patients. Occlusal adjustment can lead to a marked, stable improvement in periodontal health in terms of bacterial profile and clinical appearance, presumably by obviating tissue distress caused by occlusal dysfunction, thereby providing unfavourable conditions for bacterial growth. Bacterial profiling is an effective indicator of periodontal health.

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EVALUATION OF THE EFFICACY OF A NEW ORAL GEL AS AN ADJUNCT TO HOME ORAL HYGIENE IN THE MANAGEMENT OF CHRONIC PERIODONTITIS. A MICROBIOLOGICAL STUDY USING PCR ANALYSIS

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The use of chemical devices for non-surgical periodontal therapy has led to new treatment strategies aiming primarily at infection control and oral bacterial load. Over the last few decades adjunctive chemical devices has been subjected to many scientific and medical studies. The purpose of the present study was to assess the effect of a new oral gel named Parodongel on the red complex organisms using Polymerase Chain Reaction (PCR) for microbiological analysis. A total of 10 patients with a diagnosis of chronic periodontitis in the age group >25 years, were selected. None of these patients had received any surgical or non-surgical periodontal therapy and demonstrated radiographic evidence of moderate bone loss. Four non-adjacent sites in separate quadrants were selected in each patient for monitoring based on criteria that the sites will localize chronic periodontitis. Microbial analysis (MA) was performed at baseline and at day 15. Paired T-Test was used to detect statistical significant reduction of specific bacteria. The results showed statistically significant reduction of the overall bacterial loading and *Treponema Denticola* from baseline to day 15. Parodongel can be used as an effective local drug delivery together with oral home care in treatment of chronic periodontitis.

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EVALUATION OF THE EFFICACY OF A NEW ORAL GEL CONTAINING CARVACROL AND THYMOL FOR HOME ORAL CARE IN THE MANAGEMENT OF CHRONIC PERIODONTITIS USING PCR ANALYSIS: A MICROBIOLOGICAL PILOT STUDY

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The use of chemical devices for domestic oral hygiene in periodontal patients has led to new treatment strategies aiming primarily at a control of infection. Over the last few years, carvacrol and thymol (CT) have been subjected to many scientific and medical studies. The purpose of the present study was to assess the effect of CT on the red complex bacteria using Polymerase Chain Reaction (PCR) for microbiological analysis. Five patients with a diagnosis of chronic periodontitis in the age group >25 years, were selected. None of these patients had received any surgical or non-surgical periodontal therapy and demonstrated radiographic evidence of moderate bone loss. After scaling and root planning, patients received a CT gel to be used at home. Four non-adjacent sites in separate quadrants were selected in each patient for monitoring, based on criteria that the sites localize chronic periodontitis. Microbial analysis (MA) was analyzed at baseline and at day 15. SPSS program was used for statistical purposes and a paired samples correlation was performed at the end of the observation period. Although an absolute reduction was observed among the studied bacteria (i.e. *Aggregatibacter actinomycetemcomitans*, *Porphyromonas gingivalis*, *Tannerella forsythia*, *Treponema denticola*, *Fusobacterium nucleatum*, *Campylobacter rectus* and Total bacteria loading) none reach a statistical significant value. The present study demonstrated that CT gel has a small impact on oral biofilm. Additional studies are needed to detect the efficacy of CT gel.

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WHY SHOULD PATIENTS WITH SYSTEMIC DISEASE AND TOBACCO SMOKERS GO TO THE DENTIST?

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Periodontal diseases (PD) affect about half of the adult population all over the world. PD is caused by bacterial infection which induces an inflammatory response with progressive destruction of the periodontal tissues and finally the loss of teeth. Tobacco smoking (TS), alcohol consumption, and systemic diseases (SDs), such as cardiovascular diseases, diabetes mellitus, respiratory diseases, osteoporosis, malnutrition and stress, are considered additional risk factors. This short review examines the potential causal association between PD, TS and SDs. There is strong evidence that PD is associated with an increased risk of SDs. In addition, many patients with SDs are also affected by PD, which can be mild or severe, and tobacco smokers manifest a greater risk of developing PD. The aim of this manuscript is to investigate the effects of periodontal therapy on the management of SDs and influence of TS on PD. This manuscript includes many randomized controlled trials and reviews to test the effects of different periodontal therapies for patients with SDs. A definite conclusion on the relationship between PD and SDs is lacking, however, there is sufficient evidence to justify periodontal treatment to prevent SDs; in fact, PD is prevalent in the middle-aged population and can have a significant impact on systemic health.

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THE ECOLOGICAL CATASTROPHE OF ORAL DISEASES: A POSSIBLE LINK BETWEEN PERIODONTITIS AND PROTOZOA

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Periodontal disease (PD) is one of the prevalent diseases in the adult population. The etiology of PD has never been completely understood, however, loss of balance between the host immune system and the microbial virulence of PD pathogens may be considered the trigger of PD. In fact, the immune system, activated by microbiological agents, attacks the host and not the biofilm bacteria, causing the destruction of periodontal tissue, alveolar bone and loss of teeth. Parasites may play an important role in the pathology of PD. The first studied and the most common parasite in the oral cavity is *Entamoeba gingivalis*. A possible link between *E. gingivalis* and PD has never been demonstrated completely, however *E. gingivalis* is infrequently found in people without PD. In addition, there is evidence that *E. gingivalis* could favour the onset and progression of PD. In conclusion, we can assert that *E. gingivalis* and PD may be correlated. This relationship can open new therapeutical approaches for treating PD, particularly in cases refractory to therapy.

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BACTERIAL LOAD OF PERIODONTAL PATHOGENS AMONG ITALIAN PATIENTS WITH CHRONIC PERIODONTITIS: A COMPARATIVE STUDY OF THREE DIFFERENT AREAS

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The aim of the present study was to evaluate the mean bacterial load of some periodontal pathogenic bacteria in Italian patients affected by chronic periodontitis. The sample consisted of 1,762 patients with a clinical diagnosis of chronic periodontitis based on the criteria of the American Academy of Periodontology sampled in the period 2013-2015; 1,323 patients were from Northern Italy, 317 from Central Italy and 122 from Southern Italy. Samples for microbiological analysis were collected from the four sites of the greatest probing depth in each patient and then processed by quantitative polymerase chain reaction. Periodontal pathogens have the following percentage respect to total bacteria load: *Aggregatibacter actinomycetemcomitans* 0.1%, *Campylobacter rectus* 2%, *Fusobacterium nucleatum* 8%, *Porphyromonas gingivalis* 6%, *Treponema denticola* 2%, and *Tannerella forsythia* 1.5%. There are significant differences in bacterial load among the different geographical areas both for the total bacterial and for the single species. The results of our study in this Italian population showed that a different geographic distribution exists among periodontal pathogens. We hypothesize that these differences in bacterial load could be related to genetic and environmental factors. Additional studies are necessary to confirm these data and to get more insight on additional factors, which may play a role in periodontal pathogens in different geographic areas.

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INFECTOGENOMICS: LACK OF ASSOCIATION BETWEEN VDR, IL6, IL10 POLYMORPHISMS AND “RED COMPLEX” BACTERIAL LOAD IN A GROUP OF ITALIAN ADULTS WITH CHRONIC PERIODONTAL DISEASE

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Periodontitis is a multifactorial disease that, if untreated, may cause teeth loss. Clinicians and researchers have reported that genetic factors influence the clinical manifestations of periodontal disease (PD), modulating both inflammation of the mucous membranes and loss of alveolar bone. The acquisition of new knowledge about genetic susceptibility of PD, would directly impact on prognosis and treatment of the disease. In addition, a better understanding of PD pathogenesis could improve the diagnostic tools for the prevention, and therapies for modulation of immune responses and treatment of PD. In this study, we evaluated genetic polymorphisms of VDR, IL6 and IL10 and amounts of periodontal pathogens in Italian adults affected by PD. We included 326 cases classified according the criteria of the American Academy of Periodontology. No significant differences in bacterial load were found in patients carrying PD susceptibility alleles of IL6, IL10 and VDR genes. In conclusion, no interaction between genetic factors and amount of periodontal pathogens in periodontal pockets were found in PD patients.

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EVALUATION OF LIGHT-EMITTING DIODE (LED-835 NM) APPLICATION OVER HUMAN GINGIVAL FIBROBLAST: AN *IN VITRO* STUDY

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Since the laser and photomodulation were discovered over 50 years, they have been used for many applications in medicine and in dentistry also. In particular, light-emitting diodes therapy (LT) achieved a great success in medical treatment and photo-therapy. In the decades, LT has been used for several therapeutic purposes. Many beneficial effects have been demonstrated *in vitro* and *in vivo*, including antibacterial, antiviral, antitumor, cell differentiation, immune potentiating and tissue repair activities. Beneficial effects of LT have also been observed in clinical settings. Although there are lots of cell culture studies in low-level laser therapy, there are only a few cell culture studies in LT that have similar characteristics. The aim of this study was to investigate the effects of LT on primary human gingival fibroblast cells (HGF) on elastin (ELN) gene activation using Real Time PCR. ELN gene activation is directly connected with elastin protein production and HGF functionality. Human gingival tissue biopsies were obtained from three healthy patients during tooth extraction. The gingival specimens were fragmented with a scalpel and transferred in culture dishes containing Dulbecco's modified Eagle medium supplemented with 20% fetal calf serum (FBS) and antibiotics, i.e. penicillin 100U/ml and streptomycin 100µg/ml. Cells were incubated in a humidified atmosphere of 5% CO₂ at 37C. The medium was changed the next day and twice a week. After 15 days, the samples of gingival tissue were removed from the culture dishes. Cells were harvested after an additional 24 h incubation. Human gingival fibroblasts at the second passage were seeded on multiple 6-well plates. The cells stimulation was performed with a light-emitting diodes (LEDs) medical device type E-Light. The LED irradiation seems to be directly correlated with the elastin (ELN) gene activation. Interestingly, ELN gene expression in the cultured human gingival fibroblasts seems to be inversely related to the patients' age; in fact, its expression tends to decrease with aging. In summary, the result of the present study shows that LED irradiation promoted ELN gene expression more in elderly than in younger adults.

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ORAL SQUAMOUS CELL CARCINOMA: DIAGNOSTIC MARKERS AND PROGNOSTIC INDICATORS

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OSCC is the most frequent malignant tumour of the oral cavity, accounting for more than 90% of malignant tumours of this anatomic region and it often arises from precursor lesions. Aside from tobacco and alcohol consumption, further determinants have been considered to increase the risk of OSCC development, such as micronutrient deficiencies, chronic traumatism, poor oral hygiene and viruses. Recurrence, survival and conversely, mortality depends on numerous and different biological, histological, macroscopic and microscopic factors that have been investigated in order to define causes, to help diagnosis and to refine appropriate treatments that perfectly fit with the different features of OSCCs. For this purpose, during the last decades, the improvement of scientific technologies and molecular analyses have allowed to investigate markers and genetic and epigenetic factors, in order to clarify their responsibilities related to early diagnosis and OSCC progression and prognosis in order to address them as targets in future selective and individually-shaped therapies. This review will focus on the etiology, advances in diagnostic markers and prognostic indicators for oral cancers.

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LIGHTS AND SHADOWS OF BONE AUGUMENTATION IN SEVERE RESORBED MANDIBLE IN COMBINATION WITH IMPLANT DENTISTRY

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Edentulous mandible frequently undergoes severe bone atrophy with problems of prosthetic instability. Instability of the lower denture may cause difficulties with eating and speech, ulcerations of the oral mucosa for lower denture trauma, loss of facial vertical dimension. These problems may be solved by bone augmentation of severe resorption of edentulous mandible. The aim of this short review is to describe surgical techniques for bone augmentation of the severe resorption of edentulous mandible. In this paper, we define a severe resorption of edentulous mandible as a mandibular height in the symphyseal area of 12 mm or less as measured on a standardized lateral cephalogram. Bone grafts and distraction osteogenesis have allowed improving implantology from an experimental to a consolidate dental procedure. It is currently a valuable treatment modality in the prosthetic treatment of severe resorption of edentulous mandible. Numerous techniques have been developed for the rehabilitation of edentulous mandible with fixed or removable mandibular dentures. Today, the options for the restoration of the severe resorption of edentulous mandible with implants can be categorized as follows: insertion of short and narrow implants and a fixed or removable prosthesis; augmentation of the bone with the use of distraction osteogenesis or grafting procedures in combination with the insertion of dental implants loaded with fixed or removable prosthesis; placement of a transosteal dental implants supporting a denture.

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SUCCESS OF IMMEDIATE VERSUS STANDARD LOADED IMPLANTS: A SHORT LITERATURE REVIEW

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Oral rehabilitation with implant-supported restorations has become a successful therapy resulting in high survival rate (SR). Recently, some reports have stated that submerged implants have no differences in SR compared to transmucosal implants. It was also reported that a reduction in timing of implant loading (from 12-24 weeks to 6-8 weeks) does not affect the predictability and SR of the implants. In particular, the reduction of the loading period is well accepted by the full edentulous patient, due to the functional and aesthetic problems related to denture wearing. The purpose of this report is to evaluate the SR of immediate loading implants (ILIs) compared to placing implants in native bone, with bone graft, in post-extraction sites, with the help of computer guided implant dentistry. The aim of this short review is therefore, to assess whether ILIs achieve similar clinical outcomes when compared to conventional loading protocols. As stated in preview reviews, we can affirm that there is no difference in SR at ILIs against delayed implants and with respect to placing implants in native bone, with bone graft, in post-extraction sites, with the use of computer guided implant dentistry. Keeping in mind the limitations of the present review, we can affirm that ILIs have a similar SR when compared to conventional loading protocols.

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A HISTOLOGIC ASSESSMENT OF A HYBENX® ORAL TISSUE DECONTAMINANT IN VITAL PULP THERAPY IN DOGS

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The aim of this study was to assess HYBENX® Oral Tissue Decontaminant (HOTD) in treating vital pulp exposure in a canine model. The use of HOTD solution was compared to an accepted and standard regimen for vital pulp exposure, an application of a commercial calcium hydroxide product (Ca(OH)₂). Both control and experimental treatments were followed by restoration with a commercial zinc oxide and eugenol obtundant intermediate restorative material and thermal insulator (ZOE). At 7 days there was 100% pulp vitality with HOTD and 50% with Ca(OH)₂. New dentin formation was seen in 62.5% of the HOTD treated pulps and none of the Ca(OH)₂ treatment group. The vital pulp exposures at day 21 post treatment with HOTD also showed significant improvement over Ca(OH)₂ in the presence of odontoblasts, new dentin formation and pulp survivability. The presence of odontoblasts and new dentin was noted in 71% of the HOTD cases versus 50% of the survivable Ca(OH)₂ cases. Furthermore, 100% of HOTD cases had vital pulps versus 62.5% of Ca(OH)₂ cases. The 60-day specimens of both experimental and control techniques exhibited histologically similar appearances and were similar in outcomes. HOTD treatment at day 7 showed a significant positive difference, both in the formation of new dentin and tooth vitality. HOTD proved better for the post 21-day specimens and equivalent for the 60-day pulp specimens with no evidence of untoward tissue reactions or results.

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BACTERIA PREVALENCE IN A LARGE ITALIAN POPULATION SAMPLE: A CLINICAL AND MICROBIOLOGICAL STUDY

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The present study detects those bacterial species which are more strongly related to bleeding on probing, suppuration and smoking in periodontal-affected patients. Nine hundred and fifty-one patients with periodontal diseases were admitted to the Department of Periodontology & Implantology, Dental School of Bologna University where they underwent microbiological tests for six periodontal pathogens (*Actinomyces actinomycetemcomitans*, *Porphyromonas gingivalis*, *Prevotella intermedia*, *Treponema denticola*, *Fusobacterium nucleatum* and *Tannerella forsythia*). Cluster analysis explored the variables that mostly influence both the presence and absolute\relative bacterial load. Logistic regression and multivariate linear regression quantifies these relations. The probability of recovering bacteria belonging to the Red Complex is greater by 25-48% in presence of bleeding on probing. When probing depth is <3 mm the probability of presence of each bacterial species is inferior in comparison with depth >6 mm both for Red Complex (of 20-37%), the Orange complex (of 41-61%) and *Actinomyces actinomycetemcomitans* (46%). Total bacterial cell count increases with pocket depth above all for the Red Complex. As *Treponema Denticola* and *Tannerella Forsythia* presence is associated with bleeding on probing and *Prevotella intermedia* presence with suppuration and smoking. The examination of these three as indicators of periodontitis evolution is suggested.

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AN OVERVIEW ON BONE RECONSTRUCTION OF ATROPHIC MAXILLA: SUCCESS PARAMETERS AND CRITICAL ISSUES

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Long-term success rate of implants inserted in atrophic maxilla is ensured through sufficient bone volume in edentulous sites. Reconstructive surgery is necessary before implant placement to regenerate bone defects caused by atrophy, dental trauma, extractions or periodontal disease. Success rate of implants is related to the correct position and angulation of implants in residual crest, so that height and thickness of bone augmentation can allow predictable results. The most popular surgical procedures to obtain bone augmentation are: bone grafts, guided bone regeneration, maxillary sinus floor elevation, and bone osteogenesis distraction. Bone graft is the gold standard technique to achieve bone augmentation of edentulous crests and to obtain appropriate bone volume and morphology. Guided bone regeneration is a surgical technique that uses barrier membranes to promote osteoblast cells proliferation and exclude other cells such as epithelium and connective tissue cells. Guided bone regeneration is often combined with bone grafting procedures. Sinus floor elevation procedures are elective treatments when there is insufficient bone height for implant insertion in maxilla. Sinus floor elevation for implant insertion in maxilla in conjunction with autologous bone was described with long-term follow-up. Bone osteogenesis distraction is the process of bone generation between two bone segments in response to tensile stress. The aim of this short review is to analyze the different methods of increasing bone in atrophic maxilla: bone grafts, guided bone regeneration, maxillary sinus floor elevation, and bone osteogenesis distraction.

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RADIOFREQUENCY TREATMENTS: WHAT CAN WE EXPECT?

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Among non-ablative procedures in aesthetic medicine, the radiofrequency (RF) is one of the most popular for the treatment of face and body skin laxity. It can be classified as a physical bio-stimulation that produces a temperature increase on biological structures, using electromagnetic waves. The term encompasses devices having substantial differences in energy, wavelengths, handpieces dimension and structure. Moreover, for some of these, the protocols are only partially defined. The aim of this short review is to clarify some aspect of the RF therapy starting from the physics, passing through the mechanism of action and finally, with the most suitable protocols. Contrary to mechanic waves, electromagnetic waves, physics are always transversal to the impulse and this leads to the different energy distribution in capacitive (monopolar) or resistive (bi- or multi-polar) applications. The thermal damage as therapeutic effect is a postulate that needs to be discussed and the same is true for the terms “non-surgical” and “non-ablative”, often recurrent in the scientific literature. Protocols must be optimized according to the machine and the patient, keeping in mind the possibilities of biostimulation in terms of immediate improvement and of long lasting investment in skin rejuvenation. It is mandatory to understand the possibilities and limitations of each device to perform useful, safe and correct medical treatments.

0393-974X (2016)

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NON-ABLATIVE RADIO-FREQUENCY REJUVENATION: A HISTOLOGICAL AND BIO-MOLECULAR REPORT

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Radiofrequency machines for medical use are known to produce moderate clinical improvement of skin laxity without invasive procedures. Numerous equipment with different characteristics have been proposed after the introduction in 2002 of the first FDA approved device. This report is aimed to test if RF treatment is effective when performed at low frequency and low energy level. Two RF treatments were performed unilaterally 7 and 2 days before a planned eyebrow lifting surgery, with a radiofrequency device with 0.52 to 0.7 MHz frequencies, maximum energy of 200 W, used at 40% of its power. A bipolar handpiece with a diameter of 30 mm and a maximum power of 9-9.5 W was massaged along the temporal area for 10 min. Skin samples of treated and untreated sides were collected during surgery and processed for histologic examination and RT-PCR analysis, to test differences in gene activation in a panel of proteins that are relevant in extracellular matrix of dermal connective tissue. The histological examination of the samples showed that the treatment induced a loss of the typical oriented structure in the reticular dermis. The study through RT-PCR evidenced that ELN, the gene codifying for Elastine was strongly enhanced. Some collagen-coded genes (COL1A1, COL3A1 and COL9A1) were inhibited by the treatment, whereas COL2A1 and COL11 were activated. The genes responsible for Metallo-proteases (MMP) 2, 3 and 13 were depressed, while the MMP9 was stimulated. Gene codifying for Hyaluronic synthase 1 (HAS1), Hyaluronidase 1 (HYAL1), Neutrophyl elastase (Elane), Desmoplakin (DSP) and GDF6 were inhibited. Insulin like growth factor (IGF1) gene activity was enhanced. RF treatment, with the tested non-ablative equipment, produced histological effects and change in DNA expression of some extracellular matrix related genes, confirming the biostimulatory role of this procedure.

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