RESEARCH COMPETITION

Maxillary sinus augmentation by crestal approach: surgical techniques evaluation

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Aim: Insufficient vertical bone volume is a common problem encountered in the rehabilitation of edentulous posterior maxilla with fixtures, limited by the presence of the maxillary sinus. The crestal approach for maxillary sinus lift augmentation is nowadays a valid option to the lateral approach. Currently different techniques have been proposed in literature. The aim of this research is to define the available techniques and evaluate advantages and disadvantages arising from previous studies.

Materials and Methods: A search on the main electronic databases as Pubmed, Chocrane library, Medline was performed. The bibliographies of review articles were checked, and personal references were searched. The articles were selected using specific inclusion criteria as date, no older than 2005, and number of cases used for the articles included. Randomised controlled trials of different techniques and materials for augmenting the maxillary sinus for rehabilitation with prostheses on fixtures reporting the outcome of implant therapy were included.

Results: The literature search yields 10 representative articles which have been identified on the techniques of maxillary sinus lift and their evolution. The crestal approach appears as an innovative and more conservative technique than the classical lateral access technique, even this gold standard has a success rate of 76%. It has been possible to observe an evolution of the sinus lift technique by crestal approach. The

crestal approach looks minimally invasive, reducing post-operative edema, preserving autogenous bone and Schneider membrane from complications, but permits only a limited amount of augmentation, actually requires residual bone height of at least 4 mm. Different surgical techniques were found: the Summers technique, the Cosci technique (Sincrest technique) and the more recent one Iraise system.
Conclusions: Crestal techniques show a low traumaticity, and therefore by the preservation of the Schneider membrane, with a rate of perforations markedly lower than the lateral access technique, and determined less intra- and postoperative morbidity. The Summers technique is the first one, it is performed by using osteotomies and it shows excellent success at 3 years, but with significant morbidity both intra and post-operatively, as well as with a rate of 0-10% of perforation of the membrane. The following technique have been improved: first with the technique of Cosci (success of 96.3% at 5 years), based on the Sincrest system. The most recent, the Iraise system technique, would seem to be the new predictable technique for sinus lift but futher studies are needed.

A novel diagnostic software for guided implant surgery: Case series

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Aim: The R2 Gate is a novel diagnostic software, that analyses digital datas and guides the clinicians for a safe implant surgery. By analyzing the characteristics of the site in three dimensions prior to surgical time this method allows to perform implant's insertion in the best position in order to reach an optimal implant-prosthetic rehabilitation. The goal of this clinical study was to evaluate the success of guided implant surgery using 3D printed guides.
Materials and Methods: A total of 14 patients (3 males, 11 females), between 37 and 82 years old, were included in this clinical study. The procedures began with Primary Virtual Planning (PVP). The Cone Beam Computed Tomography (CBCT) is the most efficient diagnostic exam to check bone's shape and volume so the first step was to analyze patient's CBCT. Each CBCT was taken with the help of an R2 Tray in order to register the correct occlusion of the patient. The CBCT was then sent to the R2 Digital Center by the clinician, with the R2 Tray and first conventional impressions attached. Once datas were received, safe guided implant positioning was digitally projected by R2 Gate center using the R2 Gate software by matching all the informations. The second step was the preparation of the R2 Gate guide with a three-dimensional (3D) printing based on the digital project. The guides were printed as one body structure in resin material with metal-free holes for implant's positioning and drill stoppers in order to guarantee a precise surgical phase. The third step was the insertion of the implants with R2 Gate guide, performed with Megagen Anyridge implants. Once delivered to the clinician, the R2 Gate guide was always attached with the digital project, which described bone density, implant's dimensions and the drills succession for each surgical site, to guide the clinician during the surgery.
Results: The surgery was performed with the use of 3D printed surgical guides produced through virtual planning methods. The patients underwent open flap or flapless surgeries and all the implants were inserted as planned. A total of 47 implants were positioned with a survival rate of 91,5% (4 implants failed). 3 lost implants out of 4 were substituted afterwards. Only 3 rehabilitation showed post-surgical complications: 1 patient showed vestibular edema after implant's positioning, solved with antibiotics (Metronidazole) for 10 days; 1 patient showed minimal fixture's surface exposition, treated with GBR approach with bone graft (BiOss) and resorbable membrane and 1 patient showed implant site's inflammation that required open flap debridement and disinfection, followed by GBR of the defect with BiOss graft. Actual average follow up is 4 years, settled at 15/12/2019. At the moment only 13 prothetical rehabilitations out of 21 have been delivered (6 finals and 7 temporaries).
Conclusions: R2 Gate system showed good results in this study, allowing to reach successful implant rehabilitations for our patients; by digitally analyzing the site, it allows to obtain an accurate 3D guide. The clinician can perform fixture's insertion in the best position possible, with maximum bone availability and correct inclination which will also affect the future prosthesis, while respecting all the surrounding anatomical structures. It also reduces surgical times and post-operative discomfort for the patient allowing faster recovery by flapless surgery. The less invasiveness permitted makes it extremely indicated for patients who present systemic diseases which might contraindicate conventional implant surgery such as reduced blood haemostasis and vascular or heart conditions. This novel diagnostic software for guided surgery is a safe procedure with good outcomes, which consent to approach the surgical act comfortably while respecting the basics of prosthetically guided implant surgery.

Implant supported restoration in single-tooth replacement

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Aim: In contemporary dentistry, implant-supported restorations have become the elective method in patients missing a single tooth. The aim of the present study is to estimate the results of the treatment of patients with implant-supported prostheses in single tooth replacement.
Materials and Methods: The study included 90 subjects, aged between 18 and 60 years with single missing tooth, who received implant prosthetic treatment. Inclusion criteria: single tooth loss in the maxilla or mandible, the presence of two intact adjacent teeth, sufficient natural bone, to obtain a primary stability of the implant, the depth of the free gingival margin at least 2 mm, plaque index and bleeding index <25%. Exclusion criteria: subjects with partial or extended partial edentulism, a history of systemic diseases, alcohol or drug abuse, immuno-compromised status, psychiatric disorders, pregnancy or lactation, uncontrolled periodontal disease, severe bruxism, loss of bone ridge (>5 mm) after tooth extraction, refusal to participate in the study or unavailability of follow-up during the study. The following parameters were evaluated: mesial and distal papilla height at the implant site, clinical crown length at the implant site, clinical crown length at the adjacent teeth, width of the labial keratinized mucosa at the implant site and adjacent teeth, full mouth plaque score, full mouth bleeding score. A visual analogue scale (VAS) questionnaire was used to assess the level of patient satisfaction regarding the aesthetic outcome. PES and WES evaluations were performed.
Results: Patients treated with implant-supported prosthesis had more frequent single edentulous space after missing of the first molars (30.0%) and lateral incisors (28.9%), less frequently of the first premolars (12.2%) and the secondary premolars (12.2%). The single edentulous spaces were predominantly localized (56.7%) in the anterior region of the jaws. After a follow-up period of 47.44 ± 1.7 months, the survival rate of the implant constituted 100.0%, the survival rate of the crown on implant support 100.0% and the success rate of the implant 95.6%. Complications were found in 43.3% of patients, including 16.7% biological complications and 43.3% aesthetic complications. Technical complications were not detected. All patients with single edentulous space treated with implant-supported prostheses were satisfied with the appearance of the mucosa, with the implant, with the appearance of the crown on implant support, with the aesthetic result and with the masticatory function.
Conclusions: The implant-prosthetic restoration in single tooth replacement is a viable treatment option for functional restoration of tooth loss. The crowns on implant support are cost–effective long term treatment option in these cases. The chosen material and the type of abutment for manufacturing the implant restoration do not ensure high aesthetic results, if all parameters are not taken into account.

Immediate provisionalization of bone level implants with a hydrophilic surface. A single blind, randomized clinical trial

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Aim: To compare the radiographic bone level changes, clinical parameters and aesthetic outcomes of immediately provisionalized and conventionally restored implants with a hydrophilic surface at 12, 36, 48 and 60 months post implant placement.
Materials and Methods: In 24 systemically healthy patients, 24 bone level implants with a hydrophilic (SLActive) surface were placed in healed sites in the aesthetic area (incisor, canine or premolar) and they were either immediately provisionalised with a non-occluding temporary crown (test group) or left without a crown (control group). In both groups, the definitive restoration was placed 16 weeks after implant placement. Clinical and radiographic parameters were calculated by a blind examiner at 12, 36, 48 and 60 months post-implant placement, together with implant success/survival rates according to three different sets of criteria. The aesthetic outcome was evaluated through the Papilla Fill Index (PFI) and the Pink Esthetic Score (PES).
Results: A total of 24 patients were recruited for this study, which were all included in the 12-months analysis, while only 16 patients took part in the subsequent follow-up visits (7 in test and 9 in control group). Similar radiographic bone changes were observed between the two groups at all follow-ups but at 36 months, when an increased bone loss was observed in the immediately provisionalized group (-0.32 mm, 95% CI -0.57–0.07 mm; p=0.019). A tendency for an improved aesthetic outcome from implant loading to the subsequent follow-ups was noticed in both groups, although this trend reached statistical significance only in the control group. No significant inter-group differences were observed. Both groups presented with high levels of long-term implant survival (100%) and success.
Conclusions: Non-functional immediate provisiona-

lization seems a viable long-term option for the management of single-tooth implants in the aesthetic area. While immediate provisionalization might stimulate a greater interproximal bone loss within the first 3 years of function, in the longer term, peri-implant bone levels tend to stabilize and to reach values that are comparable to conventional loading. Remarkably, the test group started with a better PES at loading (11.1) compared to the control group (10.0) and this might explain why only the control group showed a statistically significant improvement in PES at the subsequent follow-ups. The study suggests that by placing a crown within the first 48 hours from implant placement, it might be possible to condition the peri-implant soft tissues earlier, particularly in terms of papilla shape, level of soft tissue margin and soft tissue contour. However, in the long-term, comparable results can be achieved with immediate and conventional loading.

A comparative study measuring the effect of piezosurgery vs conventional implant site preparation on the implant stability using Resonance Frequency Analysis (RFA)

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Aim: The aim of this study is to carry out the comparative evaluation of piezosurgery with the conventional surgery in preparing implant site and the effect of two procedures on the primary and secondary implant stability measured in terms of ISQ (Implant Stability Quotient).
Materials and Methods: A sample size of 30 patients were selected with at least one edentulous site present bilaterally in mandibular posterior region. Other inclusion/exclusion criteria were considered for selection of the patient. Patients were assigned to two different groups based on the type of implant site preparation carried out. Site A: Test site (implant placement using piezoelectric surgery) Site B: Control site (implant placement using conventional surgery) The randomization of the bilateral edentulous sites for implant placement was done by the flip of a coin. All the patients were informed about the details of the study and written informed consent was obtained. Pre-surgical evaluation as well as pre-surgical clinical and radiological investigations (radiovisiography, CBCT) were carried out. Following Phase I therapy, surgical implant placement was carried out at different points in times. Primary stability was measured using Resonance Frequency Analysis (RFA) and ISQ values were obtained immediately after implant placement for both sites secondary stability was measured 06 months after implant placement. Values obtained were subjected to statistical analysis. Patient-based post-operative response was also measured using pain and discomfort being measured on the Visual analogue scale (VAS) with values ranging from 0-10, with 10 being the most severe pain. Patient were kept blinded for the procedure and the VAS score were obtained 10 days post-operatively.
Results: In the present study, RFA showed higher mean ISQ values for site A compared to site B (site A 74.3, site B 70.93). This demonstrates higher primary implant stability when implant site preparation is carried out with piezosurgical inserts. Secondary implant stability measured at 06 months post-operatively, suggested similar observations in mean ISQ values (site A 76.7, site B 72.7). The difference between the two groups is again statistically significant. The mean VAS scores for site A was 5.9 and for site B, it was 7.2. The difference in means of 1.3 was statistically significant.
Conclusions: Implant stability measured with RFA and patient's post-operative pain assessed using VAS scores revealed significant results in favour of piezosurgery. Within the limitations of the present clinical study, it was found that piezosurgery is a viable alternative to conventional rotary instrumentation for carrying out the implant osteotomy. Longitudinal studies with larger sample size and long-term follow up is required to confirm the predictability of this surgical technique.

Evaluation of Salvadora persica L. chewing sticks effects on plaque removal and gingival health: A randomized controlled study

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Aim: To compare the effect of using Salvadora persica L. chewing sticks and toothbrushes on plaque removal and gingival health, in a Tunisian sample.
Materials and Methods: A randomized, single-blind, controlled study was conducted among Tunisian patients attending the department of periodontology at the dental clinic of Monastir. After fulfilling the entry criteria, sixty participants (n=60) were included in the study to, randomly, use toothbrushes or Salvadora persica L. chewing sticks. A week before the trial, all participants received professional tooth cleaning; 24 hours before the trial day, they stopped all oral hygiene measures. On the trial day, the O'Leary plaque index, Löe-Silness gingival index and the bleeding index were measured and instructions to use

each cleaning device were transmitted. Three weeks later, the same parameters were recorded again for all participants.
Results: Compared to toothbrushes, the use of Salvadora persica L. chewing sticks was more effective in reducing dental plaque ($p < 0.001$) and in improving, respectively, gingival and bleeding indices ($p < 0.01$, $p < 0.01$).
Conclusions: The use of Salvadora persica L. chewing sticks seems to be more effective than toothbrushes on the reduction of plaque, bleeding, and gingivitis when preceded by professional instructions.

Peri-implantitis: Current surgical protocols

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Aim: Peri-implantitis is a state defined as an inflammatory reaction around osseointegrated implants, leading to progressive loss of supporting bone. The purpose of the present study was to systematically review the literature on the surgical regenerative treatment of peri-implantitis.
Materials and Methods: A search of four electronic databases from 1990 to 2018 was performed. Studies included were human clinical trials published in English that applied surgery for treating peri-implantitis. Parameters evaluated included probing depth (PD) reduction, clinical attachment level gain, bleeding on probing (BOP) reduction, radiographic bone fill (RBF), and mucosal recession. Key words used were: Anti-infective agents; debridement; guided tissue regeneration; osseointegration; peri-implantitis; treatment outcome.
Results: The initial search obtained 883 citations. After screening and determination of eligibility, 21 articles were included in the review. Four surgical treatment groups have been identified: 1) access flap and debridement only; 2) resective approach; 3) application of bone grafting material; and 4) guided bone regeneration (GBR). Non-resorbable and resorbable membranes were used. The contaminated implant surfaces were primarily treated with mechanical means, including air abrasives, curettes made of different materials, and implantoplasty. Chemotherapy was commonly accompanied with mechanical debridement. Implantoplasty with resective surgery was associated with a higher implant survival rate, more PD reduction, and reduced bone loss compared with resective surgery alone. Precaution should be exercised when performing implantoplasty on narrower implants because of weakening the implant structure, which could potentially lead to fracture of the fixture. The CO_2, diode, and Er: YAG lasers were applied in some studies. No statistically significant differences in all assessed parameters could be found. Therefore, the limited evidence suggested that these lasers generated similar treatment outcomes as hand curettes. The majority of surgical protocols include pre-operative or post-operative systemic antibiotics followed by post-operative chlorhexidine rinse. Maintenance phase after surgery is also important which includes oral hygiene instructions and surface biofilm removal.
Conclusions: Currently available surgical approaches execute some clinical benefits, measured with surrogate endpoints in the short term. The treatment effects on implant survival and patient-centered outcomes are not known. The results provided an estimated PD reduction, among other parameters, that might be used to project treatment outcomes. Regenerative procedures using bone grafts and membranes seemed to generate greater PD reduction; however, comparative studies with low risk of bias that can substantiate this statement were lacking. The systemic condition of the patients, defect features, and types of materials could influence outcomes and should be assessed prudently.

Efficacy of implant surface decontamination in non- surgical therapy of mucositis: a randomized controlled clinical trial

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Aim: The aim of the present study was to evaluate the effect of an abrasive erythritol air-powder system and an Er:YAG laser device in addition to mechanical debridement with titanium curettes and submucosal irrigation with chlorhexidine 0.2% in non-surgical therapy of mucositis.
Materials and Methods: A total of 30 patients with at least one implant diagnosed with peri-implant mucositis were included in this 3-month randomized clinical trial (RCT). Implants were randomly assigned to one of the three treatment groups: non-surgical mechanical debridement of implant surfaces with titanium curettes plus a submucosal irrigation with chlorhexidine 0.2% (standard therapy- control group); standard therapy plus an air-abrasive system with erythritol powder (test 1) or standard therapy plus an Er:YAG laser device (test 2). Clinical measurements were performed by a periodontist, blinded to

treatment group, at baseline and three months after treatment including probing pocket depths (PPD), bleeding on probing (BoP), recession (REC), plaque index (PI), suppuration (PUS) and keratinized tissue (KT). The primary outcome was the complete disease resolution (total absence of BoP). The changes in clinical parameters were compared intragroup and intergroup between baseline and at three months. A Kruskal Wallis test and Wilcoxon signed-rank test (p value <0.05) were used for the statistical analyses.

Results: No statistically significant differences among the groups were observed at baseline in terms of age, smoke, number of implants, BoP, PPD, PI, PUS, REC, KT and bone level. The three treatment groups showed reductions in all clinical parameters at three months. In the control group, the mean BoP decreased from 81±24 at baseline to 35±35 at three months with a total disease resolution in 30% of cases while the mean PPD decreased from 3.16±1.14 at baseline to 2.60±0.62. In the test 1 group, BoP decreased from 86±13 to 38±34 with total disease resolution in 10% of cases while the PPD decreased from 4.61±1.82 to 3.23±1.08. In the test 2 group BoP decreased from 76±36 to 61±35 with total disease resolution in 20% of cases and PPD reduction from 4.33±1.60 to 3.61±1.07. Reductions in terms of BoP and PPD were statistically significant in the control group and test 1 between baseline and three months. No statistically significant differences were observed among the three treatment groups at three months.

Conclusions: The outcomes of the present randomized clinical trial indicate that the non-surgical therapy of peri-implant mucositis, through the use of three different treatments of implant surface decontamination, is effective in reducing BoP and PPD. Nonetheless, the use of an air-abrasive device with erythritol powder as well as an Er:YAG laser device, in addition to mechanical debridement with titanium curettes and submucosal irrigation with chlorhexidine 0.2%, does not seem to add significant benefits in terms of BoP reduction and complete resolution of disease.

Biomaterials in periodontal tissue regeneration

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Aim: Regenerative periodontal therapy includes techniques which are particularly designed to restore those parts of the tooth-supporting structures which have been lost due to periodontitis or gingival trauma. Procedures aimed at restoring lost periodontal tissues favor the creation of new attachment, including the formation a new periodontal ligament with its fibers inserting in newly formed cementum and alveolar bone.

Materials and Methods: Deep infra-bony defects associated with periodontal pockets are the classic indication for periodontal regenerative therapy. Additionally, different degrees of furcation involvement in molars and upper first premolars are a further indication for regenerative approaches as the furcation area remains difficult to maintain through instrumentation and oral hygiene. A third group of indications for regenerative periodontal therapy are localized gingival recessions and root exposure since they may cause a significant esthetic concern for the patient. The denuding of a root surface with resultant root sensitivity represents a further indication to apply regenerative periodontal therapy in order to achieve both the reduction of root sensitivity and the improvement of esthetics. Professional periodontal therapy and maintenance, combined with risk factor control, are shown to effectively reduce periodontal disease progression. In contrast to the conventional approaches of anti-inflammatory periodontal therapy, however, the regenerative procedures aimed at repairing lost periodontal tissues, including alveolar bone, periodontal ligament and root cementum, remain more challenging. Periodontal research in the past few decades has attempted to systematically determine predictably successful clinical procedures to regenerate periodontal tissues.

Results: Various methods in combination with regenerative biomaterials, such as hard- and soft-tissue grafts, or cell occlusive barrier membranes used in guided tissue regeneration (GTR) procedures, have been pursued to regenerate lost tooth support. In general, however, the clinical outcome of periodontal regenerative techniques is shown to depend on 1) patient-associated factors such as plaque control, smoking habits, residual periodontal infection, or membrane exposure in GTR procedures, 2) effects of occlusal forces that deliver intermittent loads in axial and transverse dimensions, as well as 3) factors associated with the clinical skills of the operator such as lack of primary closure of the surgical wound. Even though modified flap designs and microsurgical approaches are shown to positively affect the outcome of both soft and hard tissue regeneration, the clinical success for periodontal regeneration still remains limited in many cases.

Conclusions: Moreover, the surgical protocols for regenerative procedures are skill-demanding and may therefore lack practicability for several clinicians. Consequently, both clinical and pre-clinical research continue to evaluate advanced regenerative approaches using either new barrier membrane techniques, cell-growth stimulating

proteins or gene delivery applications, respectively, in order to simplify and enhance the rebuilding of missing periodontal support.

Salivary microbiome in smoker and non-smoker patients with periodontitis

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Aim: Smoking is one of the environmental factors associated with periodontal diseases. However, there is no knowledge about the impact of smoking in salivary microbiome. The aim of this study was to evaluate the salivary microbiome in smoker and non-smoker patients with periodontitis compared to healthy controls.
Materials and Methods: Salivary samples were obtained from 10 non-smoker patients with periodontitis, 8 smoker patients with periodontitis and 13 non-smoker healthy controls. Bacterial DNA was isolated and the V3-V4 region of 16S ribosomal RNA was sequenced with Illumina® MiSeq™. Microbiome taxonomic profiling (MTP) and community diversity analysis were performed.
Results: At the genus level, Streptococcus was most common in all groups (non-smoker patients with periodontitis, smoker patients with periodontitis and healthy controls). Haemophilus was more common in non-smokers with clinically healthy periodontium, while Porphyromonas and Fusobacterium were significantly increased in both groups with periodontitis. The number of OTUs found in MTP was the lowest in non-smokers with clinically healthy periodontium and increased in both groups with periodontitis. There was no significant difference between non-smokers and smokers with periodontitis in terms of alpha-diversity. Veillonella atypica, Streptococcus peroris group, AY005038_s, Streptococcus gordonii group were significantly increased in smoker patients with periodontitis.
Conclusions: The results of the present study indicate that differences between non-smokers with healthy periodontium and patients with periodontitis regardless of smoking habit. However, there is no significant difference between non-smokers and smokers with periodontitis. Further research is needed because of the limited number of samples in this study.

Periodontal status in a group of rural post-partum women from North-West of Romania

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Aim: Periodontitis is an infectious inflammatory condition that affects a high proportion of the population. Besides the local effects, periodontitis impacts the overall systemic health increasing the risk for various systemic diseases. In pregnant women, it is assumed to contribute as a risk factor for adverse pregnancy outcomes. This study aimed to evaluate the periodontal status of post-partum women who live in a rural area.
Materials and Methods: The study was performed in a tertiary university hospital, Gynecology Clinic 1, Emergency Clinical County Hospital, Cluj-Napoca, after receiving approval from the Hospital and Iuliu Haţieganu University of Medicine and Pharmacy Ethics Committee. Women who delivered their babies at the Gynecology Clinic 1 from April 2018 to March 2019 were selected for the study. The inclusion criteria were: aged older than 18 years, living in a rural area, able to read and understand the Romanian language. Gynecology Clinic 1 provides medical care to the population for Cluj County, but also the neighboring counties from North-West Romania. Subjects with obstetrical factors and systemic conditions associated with preterm delivery were excluded. The subjects from the available population answered a written self-report questionnaire regarding oral hygiene habits, previous oral health check-ups and treatment. Data regarding systemic conditions and birth-related information were collected from medical charts. A full mouth clinical periodontal examination with recording of Bleeding on Probing (BoP) Score, Oral Hygiene (OH) Score, Probing Depth (PD), Gingival Recession (GR) and Clinical Attachment Loss (CAL) at six sites per tooth, excluding third molars, was performed 72h after delivery. A 3-level severity scale diagnosis (severe, moderate, mild periodontitis) was defined according to CDC/AAP definitions. Gingivitis and periodontal health completed the 5-level periodontal diagnosis.
Results: A group of 81 rural post-partum women with an average age of 27 years were included in the current study. From the total number of post-partum women 40 experienced preterm births, prior to 37 weeks of gestation. Among all examined participants, 70% had moderate or severe periodontitis while only 1% was periodontally healthy. Of 63 patients diagnosed with mild, moderate or severe forms of disease, the average OH score was 68% and the average BoP score was 41%. OH and BoP scores above 50% were observed in 45 and 20 patients respectively. The average number

of examined teeth in all periodontitis patients was 25 of which 32 interproximal sites measured PD >5mm and 61 interproximal sites revealed CAL >3mm. Moreover, 62.5% of postpartum women with preterm birth prior to 37 weeks of gestation were diagnosed with a moderate or severe form of periodontitis. Twenty-three percent of all investigated post-partum women were current smokers, with an average of over 7 years of smoking. Regarding self-reported oral hygiene measures, 72% reported tooth brushing twice a day or more, 66% used mouthwashes and over 90% used interdental cleaning aids less than once a day. Regarding the frequency of regular oral health check-ups, 43% of the women visited the dentist less than once a year. About 70% reported not being previously diagnosed with periodontal disease and almost 80% of patients reported not receiving periodontal treatment in the past.

Conclusions: Poor periodontal parameters were highly prevalent among the majority of rural postpartum women despite the age of the investigated group. The self-report questionnaire revealed a lack of regular oral health care supervision provided by dental professionals, which might explain the inconsistent oral hygiene routine and behaviours of these women. A high proportion of post-partum women with spontaneous preterm delivery was diagnosed with moderate or severe forms of periodontitis. The results of this study emphasize the need for meticulous periodontal screening and treatment programs addressed especially to vulnerable groups such as pregnant women in a rural environment.

Submucosal connective tissue pedicle flap or buccal flap for the closure of oro-antral communication (OAC): A randomized clinical trial

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Aim: Evaluate two different surgical approaches to repair oro-antral communication (OAC).

Materials and Methods: Patients who were diagnosed with immediate or delayed OAC after tooth extraction were enrolled in the clinical trial. Radiation treatment to the head or neck region or current chemotherapy, pregnancy, physical or mental disabilities, diabetes were considered as exclusion criteria. Two surgical procedures were used: in the Test group (10 patients) the surgical procedure consisted of the use of a buccal flap combined with a rotated palatal pedicle connective tissue graft, while in Control group (12 patients) only the buccal flap was performed. The primary outcome of the study was the success of the surgical procedure in terms of complete closure of OAC, evaluated using the clinical probing of the wound and the Valsalva manoeuvre, three months postoperatively. Secondary outcomes of the study were: operating time and patient's pain and discomfort after surgery. Patient's discomfort and pain were evaluated using a visual analogue scale (VAS) at different times after surgery: T3, T7, T14, T30. All clinical complications were recorded.

Results: A total of 22 patients (15 males and 7 females) were included. The mean age was 55.77±17.53 years. All the surgical procedures were successful except one in the Control group where the buccal flap showed a dehiscence and the OAC was still present after surgery. Major complications occurred in four patients, three in the Test group and one in the Control group. Operating time was 21±5.46 minutes for Test group and 20±5.08 minutes for Control group. Considering patient's discomfort and pain according to VAS at the different times, data were as follow: the discomfort for the Test group was 3.4±2.43 at T3, 2.9±2.93 at T7, 1.3±1.63 at T14 and 0.3±0.67 at T30. However, the discomfort for the Control group was 3.41±1.23 at T3, 3.08±5.55 at T7, 1.5±1.62 at T14 and 0.91±1.61 at T30. The pain for the Test group was 3.4±2.38 at T3, 2.5±2.27 at T7, 0.8±1.31 at T14 and 0.1±0.31 at T30. For the Control group, the pain was 3.1±1.18 at T3, 2.8±1.26 at T7, 0.8±0.93 at T14 and 0.5±0.67 at T30.

Conclusions: This study shows that submucosal connective tissue pedicle flap is a feasible technique for the closure of OAC. Further studies with longer follow up are needed to confirm these results.

The effect of immediate implant placement on alveolar ridge preservation compared to spontaneous healing after tooth extraction: Soft tissue findings from a randomized controlled clinical trial

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Aim: The aim of this study was to compare soft tissue dimensional changes, 4 months after single tooth extraction, following 3 different treatment modalities: spontaneous healing (SH) and alveolar ridge preservation, with (IMPL/DBBM/CM) or without (DBBM/CM) immediate implant placement.

Materials and Methods: Thirty systemically and periodontally healthy patients with a single-rooted tooth scheduled for extraction were randomly

assigned to one of the three treatment modalities: IMPL/DBBM/CM, DBBM/CM or SH. After elevation of a full‡thickness envelope flap the tooth was extracted. In IMPL/DBBM/CM group, an immediate implant was placed and a xenogenic bone material was placed in the gap between the implant surface and the extraction socket with a collagen porcine matrix adapted and sutured to seal the graft and the implant. In DBBM/CM group, a xenogenic bone material was placed in the extraction socket with a collagen porcine matrix adapted and sutured to seal the graft. In SH group, the flap was repositioned with interrupted resorbable sutures and the coagulum within the socket was left for spontaneous healing. Alginate impressions were obtained after tooth extraction at the end of the surgical procedure (baseline) and 4 months after. Dental stone casts were fabricated and optically scanned, creating STL files which were superimposed and matched using a digital imaging software program. Superimposed STL files were used to assess horizontal soft tissue contour changes from baseline to 4 months after surgery. Linear measurements were performed 1, 3 and 5 mm below the most coronal aspect of soft tissue contour at baseline. Statistical analysis was performed in order to assess any possible significant difference among the different treatment modalities.
Results: Results indicate that soft tissue dimensional change is greater when the socket is left to heal spontaneously, compared to IMPL/DBBM/CM and DBBM/CM groups. However, no significant differences are present when comparing linear measurements at the 3 levels of the analysis in all treatment groups. Results indicate also that, despite the treatment groups, dimensional alterations affect more the buccal portion with respect to the lingual one.
Conclusions: An alveolar ridge preservation, with or without immediate implant placement, is quite effective in reducing soft tissue remodeling when compared to spontaneous healing. However, it is unknown if this is the result of a real difference in soft tissue healing patterns among different treatment modalities or if the results are due to underlying bone crest alterations.

Multi-layered soft tissue grafting technique

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Aim: To regenerate the lost amount of buccal plate and to preserve soft tissues around the tooth to be extracted.
Materials and Methods: 25 extraction sockets in the anterior area were selected for this technique with a minimum loss of 5 mm in the buccal wall. Measurements of the free gingival margin were assessed in relation to the adjacent neighboring adjacent tooth, to assess gain or loss of the tissues. Atraumatic extraction was made and excavation of any pathological lesions around the root was carefully made. The measurement of the length of the defect was assessed and accordingly length of the soft tissues to be grafted was determined. By the free gingival graft procedure and then modifying it into 2 layered "multi-layered" and grafted and fixed to the extraction area. The socket was filled with bone substitutes and the tooth socket was covered with autogenous soft tissue. Healing was monitored for 2 weeks, 1 month, 3 months, and 5 months from the date of extraction, at the date of implant placement a CBCT was made for the patient to show the amount of bone gained at the socket site.
Results: 25 sockets showed a gain of soft tissue by a mean of 1.85 mm and in the CBCT the hole socket gained full buccolingual dimensions with a mean loss of 0.95 mm from the adjacent tooth, and a loss of 1.5 mm in the vertical bone dimensions.
Conclusions: According to the limitations of the study the suggested dual zone technique is an effective way to preserve the socket after extracting a tooth with huge buccal wall defect.

Linear soft tissue changes of extraction sockets by comparative evaluation between intra-oral scanner and conventional impressions

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Aim: Conventional impression techniques have been used for evaluation. However, it is difficult to exclude the error of expansion, shrinkage, and distortion of materials. Recently, various methods have been reported to overcome such errors by using the intra-oral scanner. The aim of this study was to evaluate the difference between conventional and digital impressions.
Materials and Methods: Thirty patients who underwent extraction at the Dept. of Periodontology, Veterans Health Service Medical Center participated from January 2019 to August 2019. This preliminary study was conducted in 16 sites of them except the posterior areas (BOHUN IRB No. 2018-12-033). After obtaining the digital impression by the intra-oral scanner (i500, Medit, Seoul, Korea), the conventional impression was taken at the time of extraction (baseline). Two months later, they were taken in the same way. All master models were scanned again with the same intra-oral

scanner. The Standard Tessellation Language (STL) files were exported to image analysis software (Geomagic control X, 3D Systems, South Carolina, USA). STL data at 2 months were superimposed with each baseline STL date for measuring the change in soft tissue bucco-lingual thickness. Sectional images were obtained from 1 mm apical of the highest gingival level at 2 months at the mid-facial area of the extraction socket. The linear volumetric changes evaluated in the buccal and lingual region of interest (ROI). Statistical analysis was performed using a paired t-test on the mean volumetric changes evaluated in "conventional impression" and "digital impression".

Results: The median linear changes in buccal ROI (1.71±0.55 mm and 1.7±0.71 mm) and lingual ROI (0.79±0.28 mm and 0.88±0.40 mm) were evaluated for conventional and digital impression, respectively. The differences between the two groups were not significant on both buccal (p = 0.991) and lingual (p = 0.5008) sides.

Conclusions: No relevant differences between conventional and digital impressions in buccal and lingual sides were found. Further studies are needed because of the result from only a median linear change. However, the preliminary result showed that the digital impression can be applied to the evaluation of soft tissue change comfortably. This study was supported by a VHS Medical Center Research Grant, Republic of Korea (grant n. VHSMC19024").

Does alveolar ridge preservation favor ideal implant placement?

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Aim: Alveolar Ridge Preservation (ARP) is a preventive grafting technique that aims to reduce the bone volume loss that occurs after tooth extraction. The aim of this randomized, controlled clinical trial is to evaluate how an ARP technique by means of deproteinized bovine bone mineral and a collagen matrix could affect a prosthetically-driven implant position compared to unassisted extraction.

Materials and Methods: Thirty-two consecutive patients that needed an intercalated, single tooth extraction were randomly assigned to the ARP group or to the Unassisted Healing (UH) group. The patient underwent local anesthesia and the tooth was gently removed without flap elevation and bone damage. The alveolus was then filled at marginal bone level with particulate deproteinized bovine bone mineral and a round collagen matrix was placed over the biomaterial and sutured circumferentially. In the control group, the sockets were left to heal physiologically. A CBCT scan with a radiological template of the missing tooth was performed 6 months after extraction and the data were imported in a guided surgery software (Simplant 18, Materialise, Belgium) in order to place a virtual implant. Ideal implant positioning criteria were: implant axis that could allow a screw-retained, full-ceramic crown, with at least 1 mm of ceramic around the virtual abutment; at least 2 mm of vestibular bone and 0.5 mm of palatal bone around a 3.8 mm diameter implant; implant neck at 3 mm or less apical to the line connecting mesial and distal bone peaks. The implants were virtually positioned by an operator blind to the assignment. A Single Implant Positioning Index (SIPI) was formulated: Class I: all the criteria fulfilled; Class II: all the criteria fulfilled but one; Class III: only one criterion fulfilled; Class IV: need of bone reconstructive procedure.

Results: All the patients were arranged in one of the four classes according to the SIPI criteria. When compared to the UH group with Mann-Whitney's test, ARP group turned out to be favorable (p=0.332) to present a higher SIPI. Four out of 16 patients of the UH group underwent a grafting procedure before or during implant insertion, whereas no additional procedure was needed in the ARP group. The mean buccal bone thickness, as measured after the virtual positioning of the implants, was 2.504±0.7762 mm for the ARP group, whereas it was 1.731±1.048 mm for the UH group (Fig. 6). The difference was statically different (p=0.0244). The mean thickness of palatal bone after implant virtual insertion was 1.511±0.5751 mm for the ARP group and 1.681±0.7828 mm for the UH group, with a non-statistically significant p value (p=0.4877 (Fig. 7). No statistically significant difference between groups was detected about initial buccal bone thickness (p=0.2474), with a positive correlation at Pearson's test of r=0.5186 for ARP group and r=0.601 for HU group.

Conclusions: As described in most systematic reviews, even if the graft of a biomaterial immediately after tooth extraction is not able to stop the bone remodeling, ARP seems to leave an ameliorated bone volume when compared to extraction alone. However, albeit the mere volume of the ridge has to be considered as fundamental, this does not provide a complete help for clinicians. Single Implant Positioning Index ideally represents an attempt to provide a tool for evaluating effectiveness of ARP or any other intervention in terms of prosthetic outcomes. ARP procedure has shown to be able not only to reduce the need of further grafting (ARP 0% vs UH 25%), but also to improve the necessary conditions for an optimal (class I) implant placement (ARP 75% vs HU 37,5%). In conclusion, ARP is a simple, preventive technique that is able to ameliorate a single, intercalated site in order to favor the possibility of a prosthetic-driven ideal implant placement and avoiding the need for bone grafting.

Management of soft tissue around teeth with class II direct restorations

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Aim: The aim of this preliminary study within doctoral studies was to evaluate the clinical performance of class II direct restorations from the periodontal point of view.
Materials and Methods: This study was approved by the Ethical Board (No. 56/3.02.2017) of the Iuliu Hatieganu University of Medicine and Pharmacy, Cluj Napoca, Romania. Twelve patients with class II medium and deep carious lesions were included in this study. Direct fillings were performed using the proximal wall restoration technique. An Ormocer Admira Fusion® (Voco, Germany) was used in this study for direct restorations, in association with Palodent ® V3 Matrix System (Dentsply,Germany). This ormocer is the first purely ceramic–based restorative material, containing silica oxide based fillers and resin matrix without classic monomers, and provides a reduced shrinkage and good aesthetics. Four periodontal parameters were evaluated i.e. plaque indices, bleeding indices, probing depth and attachment loss at four different times, preoperatively, as well as at fourteen days, one and three months postoperatively. The periodontal parameters were evaluated using a periodontal probe (UNC- 15® probe, Hu-Friedy,USA) and all parameters were recorded in a standard chart. Plaque and bleeding indices were registered in four points at the experimental tooth and one mesial and one distal tooth near the experimental one. Probing depth and attachment loss were registered in six points on each experimental tooth. Probing depth was measured from free gingival margin to the bottom of the periodontal pocket and attachment loss from cemento-enamel junction to the bottom of the periodontal pocket.
Results: A decreasing trend of plaque and bleeding indices was observed. The probing depth was stable for most of the restorations at the reevaluation in comparison with the preoperative evaluation.
Conclusions: This preliminary investigation showed good clinical behavior of all class II restorations, from a periodontal point of view. There was no negative influence of the restorations on the periodontal status.
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Soft tissue augmentation at immediate implants using a novel xenogeneic collagen matrix in conjunction with immediate provisional restorations: A prospective case series

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Aim: To evaluate soft and hard tissue changes when combining immediate implants, hard and soft tissue grafting, and an immediate provisional restoration.
Materials and Methods: In 12 patients, immediate implants were placed in the anterior maxillary and first premolar area together with a xenogeneic bone substitute. Then a xenogeneic collagen matrix was placed under the buccal mucosal margin with an immediate provisional restoration. Study casts and clinical measurements were taken before extraction (Baseline/BS) at 6 months (6M) and 12 months (1Y) after implant placement. Files from the scanned casts were matched to calculate the linear and volumetric changes at the buccal tissues. Cone Bean Computed Tomographies (CBCTs) were taken prior to extraction and at 6M. The superimposed DICOM files allowed for assessing hard tissue changes and the superimposition of DICOM and STL files allowed for evaluating of soft tissue thickness at BS and 6M.
Results: After 6 months, the horizontal tissue contours decreased 0.66-0.57 mm, concomitant with a horizontal bone loss of 1.31-1.32 mm, measured 1 mm below the most coronal aspect of the ridge. In contrast, the soft tissue thickness, 1 mm below the gingival margin, increased 0.75-1.12 mm. At 1-year, tissue contours had decreased 1.01-0.67 mm compared to BS reaching statistical significance. The mean volume loss after 1Y was 20.43-11.70 mm^3 while the mean mucosal margin recession was 0.86-0.67 mm. These changes had a limited clinical impact as the PES Scores remained stable.
Conclusions: The tested protocol resulted in a significant reduction of the tissue contours and osseous ridge dimensions that was partially compensated by a non-significant increase in soft tissue thickness.

Envelope coronally advanced flap vs tunnel technique in the treatment of mucosal recession at implant sites: preliminary results from a randomized clinical trial

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Aim: The predictability of dental implant in replacing missing teeth has been well-demonstrated. However,

esthetic complications, such as peri-implant mucosal recession (MR), are not rare findings. The appearance of the greyish color of the implant is considered unacceptable for many patients, especially in the anterior area. Therefore, the aim of the present study was to evaluate two different approaches for treating MR.
Materials and Methods: The present study was registered at ClinicalTrial.gov (NCT03498911) and approved by the Western Institutional Review Board (HUM00140205). Twenty systemically healthy patients with a MR in the esthetic region were consecutively recruited and randomly assigned for treatment with a connective tissue graft (CTG) with the envelope coronally advanced flap (eCAF, n=10) or the tunnel technique (TUN, n=10). MR depth, clinical attachment level (CAL), keratinized mucosa width (KMW), mucosal thickness (MT) and peri-implant soft tissue phenotype (PSP) were assessed at baseline, 3 and 6-month. Soft tissue volume changes were also evaluated with an ultrasound and a 3D scanner. Blood volume was assessed at baseline, 1 week, 1 month and 6 months with ultrasound imaging. Patient morbidity and satisfaction were also recorded (ClinicalTrials.gov NCT03498911).
Results: eCAF showed significantly higher MR reduction and greater mean MR coverage than TUN (2.1±1.1 mm vs 1±0.3 mm, and 85±23% vs 70±29%, respectively p=0.01, p 0.05). An average MT gain of 1.3±0.3 and 1.4±0.4 was found in the eCAF and TUN groups, respectively (p>0.05). Similar findings in terms of volume gain were shown by the ultrasound imaging and 3D scanner. Blood volume at the earliest time points (1 week, 1 month) was significantly higher than the assessed blood volume at baseline and 6 months (p 0.05 for both comparisons).
Conclusions: eCAF + CTG showed superior results compared to TUN + CTG for the treatment of MR. The two groups showed a significant increase in MT and PSP compared to baseline, while limited KMW gain was observed. Ultrasound imaging and 3D scanner showed to be reliable tools for evaluating volumetric changes in soft tissue over time.

Free gingival graft: From evidence based to practice

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Aim: Mucogingival surgery is defined as periodontal surgical procedures designed to correct defects in the morphology, position and/or amount of gingiva. A wide variety of periodontal plastic surgery have been described, among them, the free gingival graft (FGG).
Materials and Methods: Free gingival graft (FGG) is defined as a soft tissue graft harvested from the palate with the overlying epithelium. Since its introduction, it was first used to increase keratinized tissue developmentally missing or lost. FGG is indicated for soft tissue augmentation and recession coverage at teeth and dental implant sites. Many studies have reported the importance of possessing an adequate width and thickness of keratinized tissue around both natural teeth and dental implants.
Results: Todd Scheyer and al. (2015) reported that gingival thickness (at least 2 mm) is important in maintaining periodontal health. It guarantees to teeth a gingival stability in case of sub-gingival restoration, a prosthesis or a risky orthodontic movement. Similarly to teeth, also around implants a deficiency of keratinized mucosa leads to higher soft tissue inflammation, attachment loss and then mucosal recession (Lin et al., 2013). Several trials showed that soft tissue augmentation using FGG was effective in reducing mucosal inflammation, patient discomfort, and facilitating optimal plaque control around implants lacking keratinized tissue width (Roccuzzo et al., 2016; Oh et al., 2017). Moreover, Giannobile et al. (2019) has reported that peri-implant soft tissue thickness can also affect hard tissues by reducing marginal bone loss. Implants with less than 2 mm of keratinized tissue width were more prone to develop peri-implant biologic complications. Thereby, autogenous grafts is reported to be the most predictable technique to increase the width and thickness of keratinized tissues in order to maintain peri-implant health (Thoma & al. 2018).
Conclusions: Despite the fact that other effective techniques have been developed, the free gingival graft is still an effective treatment option for several situations. The success rate could reach 87% and the predictability rate may attain 90%.

Modified VISTA (VISTAM) technique versus Coronally Advanced Flap (CAF) in the treatment of Class III or RT2 multiple recessions: preliminary results

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Aim: In order to increase the scientific evidence in the treatment of Miller Class III or RT2 multiple gingival recessions, this randomized clinical trial (CEISH UPV/EHU: M10_2017_042 / ClinicalTrials.

gov: NCT03258996) was designed to compare, in terms of the percentage of root coverage achieved at 6 months, two mucogingival surgical techniques: the Coronally Advanced Flap (CAF) and the Modified VISTA (VISTAM) adapted from the original technique of Zadeh (2011).

Materials and Methods: Sixteen subjects with no active periodontal pathology and with multiple (more than 2) Miller Class III gingival recessions (≥ 2 mm deep and with interdental papillae above the cementoenamel junction) were treated in the Dental Clinic of the Master's Degree in Periodontics and Osteointegration of the University of the Basque Country (UPV/EHU). After signing an informed consent, they were randomly assigned to one of the groups, concealing the allocation by an independent clinician and not knowing until the end of the study which technique they had received. The surgeries were performed by the postgraduate students, using in every case a connective tissue graft from the palate, with a thickness >1 mm. A trained, calibrated and blind examiner assessed the clinical parameters at baseline and 6 months, also recording the central sensitization severity-level score of the subject with the Central Sensitization Inventory prior to the intervention. In order to assess post-surgical pain and patient's aesthetic perception at 6 months, a VAS scale was used. Also, the patient filled a Pain Diary specifically designed by our team. Finally, a blind statistician analyzed the results, taking the patient as the unit of analysis.

Results: Eight subjects were allocated to the control group (CAF technique) and eight subjects to the test group (VISTAM technique). There were 6 male patients (control: n=4, test: n=3) and the mean age was 50.16 years (control: 52.15 years, test: 54.42 years). Thus, 55 Class III or RT2 recessions (control: n=24, test: n=31; $p<0.05$) were treated, with a mean baseline recession of 2.98 mm (control: 3.04 mm; test: 2.91 mm), mainly located in the mandible (26 premolars [control: n=11; test: n=14), 7 molars (control: n=2; test: n=5)]. Six months after the surgery, a mean percentage of root coverage of 63.48% (control: 70.28%; test 56.68%) and a complete root coverage of 38.75% (control: 50%; test: 27.50%) were achieved, with no statistically significant differences between groups. Also, a clinical attachment level gain of 1.96 mm and 1.52 mm and a gain in the keratinized gingiva width of 1.04 mm and 1.13 mm were observed in the control and test groups, respectively. The distance from the contact point to the interdental papilla was increased in 0.04 mm in the control group and decreased in 0.91 mm in the test group. The VAS score for patient's esthetic perception was similar for both groups, while pain measured 2 hours after the surgery was statistically higher in the test group. It should be noted that the Central Sensitization Inventory severity-level score was higher for subjects in the test group, where 3 patients also suffered some kind of post-surgical complication.

Conclusions: Even though not very experienced surgeons carried out the surgeries, at the 6-month follow-up, good outcomes were achieved concerning root coverage in these Miller Class III or RT2 multiple gingival recessions, with no statistically significant differences between the control (CAF technique) and the test (VISTAM technique) groups. More clinical trials, with higher sample sizes and longer follow-ups are needed, in which these recessions should be treated with different mucogingival techniques, while using the same kind of graft. Moreover, the patient's perception should also be recorded.

Multiple RT1/RT2 gingival recessions and non carious cervical lesions: combined restorative-periodontal treatment. A randomized clinical trial

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Aim: The main goal of this research is to evaluate the clinical performance of Coronally Advanced Flap used with or without a Connective Tissue Graft (CAF; CAF+CTG) for the treatment of combined defects (multiple adjacent RT1/RT2 gingival recessions associated with non-carious cervical lesions). The primary outcome is the complete root coverage (CRC) gained. Secondary aims are patient-related outcomes (PROM's) and the role of a residual NCCL area (after restorative treatment) as a prognostic factor.

Materials and Methods: All the subjects were consecutively enrolled at the Department of Medical Biotechnology of the University of Siena, at the Operative Unit of Periodontology, in accordance with the established inclusion criteria. The allocation of the included individuals in the experimental groups (test group=CAF+CTG; control group=CAF) was performed according to the software generated 1 to 1 randomization sequence. All clinical variables and the patient-centered outcomes were recorded at baseline, 3, 6, and 12 months postoperatively, by two masked and calibrated examiners. Firstly, a composite resin restoration of the whole portion of the NCCL coronal to the line of maximum root coverage, previously outlined, was performed. After a week, aesthetics and hypersensitivity were assessed through a VAS scale. One week thereafter, the surgical experimental treatment was deployed. The following pre-operative and intraoperative clinical variables were recorded: a) width and thickness of the keratinized tissue (wKT, GT), b) thickness of the flap (FT), c) thickness of the connective tissue graft (GrT). The intake of anti-inflammatory drugs, the discomfort related to the surgical procedure and the possible post-operative

complication were recorded one and two weeks after surgery. At the end of the experimental follow-up period, the aesthetic result obtained was evaluated both by the patient and by an experienced periodontist unaware of the previous experimental phases.
Results: The patients definitively included were 7, with a total number of 10 surgical areas. Among these, 8 received the control procedure (CAF), while 2 were treated with the test technique (CAF+CTG). The descriptive analysis of the collected data was performed. Only 3 patients, with their 5 combined defects, reached 1 year of follow-up. With regard to the main outcome variable (CRC), the CAF+CTG technique yielded better results (100% of the surgical sites) than the CAF procedure alone (50% of the surgical areas) ($p<0,05$) 1 year after the surgical procedure. Among the secondary outcomes, both surgical techniques were well accepted by the patients in terms of pain and discomfort during the early healing phase (2 weeks). Both the subjective and objective aesthetic assessments showed a marked improvement in all the included cases. The aesthetic score, indeed, was worse at the test group only after 3 months. At one-year follow-up no aesthetic differences were present between groups. In both groups dentin hypersensitivity drastically reduced after the combined restorative-periodontal treatment. Data about the impact of combined defects on the quality of life, collected by OHIP-14 questionnaires, showed that all the patients were less embarrassed, felt less uncomfortable to eat any food and had less difficulties to relax after treatment.
Conclusions: Within the limits of this still ongoing study, it is possible to speculate that the combined surgical-restorative approach is a valid procedure to obtain complete root coverage in the treatment of multiple gingival recessions associated with non-carious cervical lesions. The presence of a CTG seems to improve the clinical performance of the CAF alone.

Vertically- Coronally Advanced Flap (V-CAF) to increase vestibulum depth in the treatment of gingival recessions affecting mandibular incisors

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Aim: Treatment of gingival recessions affecting mandibular incisors is scarcely documented. Despite the shallow vestibulum depth (VD) is considered a poor anatomical condition, it has never been neither measured nor considered as a clinical parameter affecting the outcome of root coverage (RC) procedures. The aim of this study is to describe a Vertically-Coronally Advanced Flap (V-CAF) technique to obtain an increase in VD along with RC in the treatment of gingival recessions in mandibular incisors.
Materials and Methods: 20 single gingival recessions RT1 (in 20 patients) in the mandibular incisors with recession depth (RD) ≥ 3 mm were selected at Periodontal Department of Bologna University. Residual Vestibulum depth (RVD) was measured with a probe as the distance between the gingival margin and the muscles insertions at the bottom of the fornix (RVD), recession depth (RD), probing pocket depth (PD), clinical attachment level (CAL) and keratinized tissue width (KTW) were recorded at baseline and 1 year after surgery; VD was also collected immediately after surgery. The measurements were performed by an independent periodontist. Patient-reported outcomes (pain and discomfort) were evaluated based on the mean consumption of analgesics and on VAS questionnaire 1 week after surgery. All gingival recessions were treated by the same expert surgeon. The adopted surgical technique was V-CAf + CTG (Zucchelli et al., 2014). Sutures were removed after 14 days and patients received maintenance care until the 1-year examination. Descriptive statistics were computed for measurements at baseline, 1-week post-op and 1-year post-op. The RD, PD, CAL, VD and KTW parameters were expressed as mean ± SD. A 95% confidence interval was considered with $P < .05$ statistically significant.
Results: Healing was uneventful for all patients. The principal finding was the VD variation. A statistically significant difference was reported immediately after surgery with an increase of 5.9±1.2 mm of vestibulum depth compared to the baseline, remaining stable after 12 months (4.8±1.1 mm). The mean percentage of root coverage was 98.3±5.2 for all treated recessions and complete root coverage was achieved in 90% of the cases (18 out of 20). At 1-year visit, there was a statistically significant RD reduction from 5.9±1.4 mm to 0.1±0.3 mm. Similarly, there was a statistically significant CAL gain of 5.6 ±1.5 mm and KTW increase of 1.4±1.6 mm compared to baseline. The postoperative course, evaluated by means VAS-questionnaire scores and intake of painkillers, indicated a limited pain and discomfort in the first week after surgery (VAS: 2.5±2.0; mean painkillers consumption: 3.7±2.1).
Conclusions: Within the limitations of the present case-series, it could be concluded that V-CAF+CTG is a successful technique in terms of Vestibulum Depth increase and CRC for the treatment of single gingival recessions in the mandibular incisors. In particular, VD reached a significant improvement, increasing immediately after surgery and remaining stable up to the 1-year follow up; therefore, disproving the empirical idea that CAF shortens the depth of the vestibulum. Surgical aspects of this technique might be considered as key factors for these successful findings: surgical papillae including as much KT as possible, frenulum disinsertion during split-thickness

dissections, CTG with a height equal to the VD needed to be recreated acting as a double barrier (stabilizing the flap and delaying early muscle insertion), submucosal tissue removal and the apical periosteal sutures to stabilize the vertical releasing incisions.

Three-dimensional biometric analysis on width and area of keratinized gingiva and width of attached gingiva using intraoral digital scanner in Korean population

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Aim: Gingival dimension, one of the most important parameters for periodontal health, has been linearly measured by periodontal probe. But such measurement may have a risk of error of estimation. Recent scanner provides 3D data with high resolution. Analyzing the data using graphic programs enables simple linear/dimensional measurement. The aim of the study was to measure the width and area of keratinized gingiva and the width of attached gingiva using intraoral scan data in Korean population.
Materials and Methods: Participants (n = 51) were enrolled (male n = 38, female n = 13), their mean age was 24.1 years (SD = 2.2, range = 20-32). The Ethics Committee of Dankook University approved the study (approval number: DKU-IRB 2019-06-005-001). Plaque deposits were scored using the plaque index score and gingival conditions were determined using the gingival index score systems. Mucogingival junction (MGJ) was highlighted by staining alveolar mucosa using 2.5% diluted iodine solution (5.0%, Gemstein solution, Kolmar Korea, Seoul, Korea). Buccal oral mucosa in entire dentition was scanned at centric occlusion using intraoral digital scanner (i500, Medit Corp., Seoul, South Korea). The scan data were evaluated using program (Geomagic Design X™, 3D Systems, Inc., Rock Hill, SC, USA). The width of keratinized gingiva was calculated by measuring the length of curve between midfacial point of marginal gingiva to MGJ parallel to the long axis of the tooth. The area of keratinized gingiva in each tooth was calculated by measuring the area surrounded by marginal gingival line, 2 lines bisecting mesial and distal interdental papilla, respectively, and MGJ.
Results: Fifty-one subjects were enrolled after excluding 1 subject with missing tooth and 2 subjects were lost during examination. In the maxilla, the width of keratinized gingiva and attached gingiva is larger (mean 1.2 mm) than the mandible. The width was largest in maxillary central incisor (5.6±1.4 mm, 4.4±1.5 mm), smallest in mandibular 1st premolar (4.5±1.1 mm, 3.3±1.2 mm). The area of keratinized gingiva was largest in the canine and 1st molar. Distobuccal oral mucosa of maxillary second molar was not exactly scanned due to lack of accessibility.
Conclusions: In conclusion, intraoral digital scanner enable biometric analysis of the width and area of keratinized/attached gingiva in Korean population. Further studies are needed to validate the accuracy of ability of scanning keratinized/attached gingiva using intraoral digital scanner.

Single gingival RT1 and RT2 recessions and non-carious cervical lesions: combined restorative-periodontal treatment. A randomized clinical trial

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Aim: The main purpose of this study is to evaluate the effectiveness of Coronally Advanced Flap (CAF) used with or without Connective Tissue Graft (CAF + CTG), in sites presenting a combined defect (single RT1 and RT2 recession + non-carious cervical lesion) in terms of complete root coverage (CRC). Secondary aims are patient-centered outcomes and the role of the residual NCCL area as a prognostic indicator.
Materials and Methods: The eligible patients were included at the Department of Medical Biotechnology of the University of Siena, at the Operative Unit of Periodontology, according to the inclusion and exclusion criteria of the present study. The allocation was performed according to the software generated 1 to 1 randomization sequence. Patients assigned to the control group underwent the CAF procedure, whereas the CAF + CTG procedure was performed on the patients in the test group. The clinical parameters and the patient-centered outcomes were recorded at baseline, 3 and 6 months after surgery, by two masked and calibrated examiners. The first part of the treatment consists in predetermining the position of the line of Maximum Root Coverage (MRC) according to Zucchelli et al. (2006), and to allocate the composite restoration concordantly. After a week, aesthetics and hypersensitivity values were assessed through a VAS scale. Two weeks thereafter, the surgical procedure was performed. Intraoperative clinical variables were recorded: width and thickness of the keratinized tissue (wKT, GT), thickness of the flap (FT), thickness of the connective tissue graft (GrT). After one and two weeks from the surgery, discomfort, pain and the use of anti-inflammatory drugs were recorded. The parameters

assessed at baseline and at surgical time, like the Complete Root Coverage (main outcome variable), were re-assessed at three and six months follow-up.
Results: 15 patients were evaluated, out of which 5 were excluded (2 did not meet the inclusion criteria, 3 refused to participate in the study). The eligible patients were 10; of these patients 7 reached 3 months of follow up (4 subjected to CAF + CTG, 3 subjected to CAF) and 5 reached 6 months of follow up (3 subjected to CAF + CTG, 2 subjected to CAF), the other patients are performing the previous follow up. The results were evaluated by performing a descriptive analysis. In both cases clinical and aesthetic improvements were obtained. At the third month of follow-up the CAF procedure is better in terms of complete root coverage than CAF + CTG (CRC= 50% for CAF + CTG; CRC= 66,7% for CAF; p<0,05). At the six months follow-up the CAF procedure is always better in terms of complete root coverage than CAF + CTG (CRC= 33,3% for CAF + CTG; CRC= 50% for CAF; p<0,05). Moreover, the procedure that use Connective Tissue Graft associated with CAF determines worse results in terms of discomfort perceived by the patient. The impact of combined defects on the quality of life was collected by OHIP-14 questionnaires, after both procedures all the patients were less embarrassed, felt less uncomfortable to eat any food and had less difficulties to relax after treatment.
Conclusions: Taking into account the limits of the study, such as the reduced sample size and the short post-surgical follow-up period, we can assert that the combined restorative-periodontal approach for the treatment of single gingival recessions associated with non-carious cervical lesions is demonstrated to be a valid procedure to obtain complete root coverage. Notwithstanding, the current interim evaluation, suggest CAF procedure to express better clinical performance in terms of Complete Root Coverage at both 3 and 6 months of follow up.

Epidemiology of mid-buccal gingival recessions: Prevalence, severity, extent and risk indicators

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Aim: Despite their clinical relevance, mid-buccal gingival recessions (GR) have received only little epidemiological attention. In particular, only few population-based studies are available and none of them have distinguished among the different types (e.g., RT1, RT2 and RT3). This study aims to: 1. provide estimates on the prevalence, severity and extent of mid-buccal GR, and 2. identify the risk indicators associated with the presence of RT1 GR in a representative sample of the U.S. population.
Materials and Methods: A total of 10,706 subjects representative of 144 million of adults were examined. Gingival recession (GR) was measured as the distance from the free gingival margin to the cemento-enamel junction at six sites around each tooth (ICCs: 0.91-0.96). Part 1: Prevalence of GR. GR prevalence was defined as the presence of at least one mid-buccal GR ≥1 mm. It was reported at both participant and tooth-level, considering separately the entire mouth and only the esthetic zone (15-25). Moreover, we reported the prevalence of GR according to the Cairo classification (RT1, RT2, RT3). Finally, we reported the prevalence of multiple GR defined as the presence of mid-buccal GRs in at least 2 adjacent teeth.
Part 2: Severity of GR. GR prevalence was reported according to different severity cut-offs: ≥1 mm (mild), ≥3 mm (moderate), ≥5 mm (severe) and ≥7 mm (profound).
Part 3: Extent of GR. GR extent was reported at participant level as the percentage of teeth affected by GR (≥1 mm), in participants affected by GR. These percentages were reported both as mean of the percentages and categorized in localized (<15% of teeth) or generalized (≥15% of teeth).
Part 4: Risk indicators for RT1 GR. Risk indicator analyses for RT1 GR were performed, among participants without periodontitis (AAP case definition), using 2 different approaches: 1. Survey-adjusted multivariate logistic regressions (participant-level); 2. Multilevel multivariate logistic regression (participant- and tooth-level).
Results: Part 1 & 2: Prevalence and severity. The prevalence of GR (all types) was 91.6%, while it decreased to 70.7% when considering only the esthetic zone. When focusing on RT1 GRs, the prevalence (whole mouth) was 12.3%, while it was 5.8% considering only the esthetic zone. The majority of RT1 GRs was to be considered as mild (1-2 mm), as the prevalence of RT1 moderate GRs was 1.1%, while severe and profound RT1 GRs were almost 0%. Multiple GRs affected 71.7% of the population. However, RT1 multiple GRs were present only in 3.1% of the subjects. At tooth-level, the prevalence of GR was 37.4%, but most of them were RT3 GRs (21.0%): RT1 GRs were present in only 0.9% of the teeth.
Part 3: Extent of GR The mean percentage of teeth involved in participants with GR was 43.4%, while it decreased to 7.4% when focusing on RT1 GRs. Accordingly, 83.9% of the subjects with GR had generalized all-types GRs, while 8.7% of the participants with RT1 GR had generalized RT1 GRs.
Part 4: Risk indicators for RT1 GR. According to the survey-adjusted multivariate regression, age (35-49 years), gender (female), ethnicity and last dental visit (more than 6 months before) were associated with the presence of RT1 GR. The multilevel analysis confirmed 3 of the 4 patient-level variables (age was not more significant) and identified 2 additional, site-specific

factors associated with RT1 GR: the tooth type and the arch (highest ORs in incisors and in mandible).
Conclusions: According to this national representative sample, mid-buccal gingival recessions affect almost the entire population. When focusing to the RT1 ones, the prevalence is reduced to 12.3%. RT1 GRs, when present, have the tendency to be mild and to accumulate in the same participant (8.7% of participants with them had more than 15% of teeth affected). In the 3.1% of the subjects, they present as multiple GRs on adjacent teeth. Age, gender, ethnicity, dental caries exposure, tooth types and arch were identified as risk indicators for RT1 GRs.

Xenogeneic collagen matrix or palatal connective tissue graft with a coronally advanced flap for the treatment of Miller Class III gingival recessions: 6 months results

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Aim: Connective tissue graft (CTG) with coronal advanced flap (CAF) is the gold standard therapy, but it is often associated with increased patient morbidity, prolonged surgical time and limited supply. So, many efforts have been made to develop new materials in order to avoid them. The purpose of this multi-center study is to compare the effectiveness of xenogeneic collagen matrix (CM) vs CTG in combination with CAF for treatment of Miller class III gingival recessions
Materials and Methods: Twenty patients with a total of 111 Miller Class III gingival recessions were included in this study. Recessions were randomly treated according to a split-mouth design in collagen matrix (CM) + coronal advanced flap (CAF) (test) or connective tissue graft (CTG) + CAF (control). The following measurements were recorded, by a single calibrated examiner, blind with respect to the treatment assignment, at all center, at baseline, 6 months (T1) and 12 months (T2): gingival recession depth, gingival recession width, probing pocket depth, clinical attachment level, keratinized tissue width and gingival thickness measured 3 mm apical to gingival margin with a periodontal probe (T2). Patient centred outcomes were analyzed with a visual analogue scale (VAS) about postoperative pain and satisfaction with the procedure (T2). The primary outcome variable was the percentage of mean root coverage (MRC) and the secondary outcomes were the percentage of complete root coverage (CRC) patient centred outcomes, gingival thickness (GT), gain in keratinized tissue width (KTW) , clinical attachment level (CAL), recession width (RW) and time of surgery.
Results: Healing was uneventful for all the patients. At 6 months (T1), the MRC measured was 59.60±23.53 mm at test sites versus 68.70±23.53 mm at control sites ($p > 0.05$). CRC was found at 16% of test sites and 26% of control sites respectively ($p > 0.05$). Mean KTW gain measured 0.69±0.85 mm at test sites and 0.57±2.08 mm at control sites ($p > 0.05$). CAL gain was 2.36±0.97 mm in test sites and 2.60±1.10 mm in control sites ($p > 0.05$). Duration of surgery and patient morbidity was statistically significantly lower in test compared with the control group respectively ($p < 0.05$). The differences in terms of MRC, CRC and CAL gain were statistically significant between maxillary and mandibular defects in both groups ($p < 0.05$). The maxillary test MRC was 71.58±12.89 and the mandibular MRC 49.79±11.50 ($p < 0.05$). In the control group the maxillary MRC was 82.20±12.50 versus the mandibular 57.64±25.05 ($p < 0.05$). The maxillary test CRC was 22.59±23.49 and the mandibular MRC 10.60±14.94 ($p > 0.05$). In the control group the maxillary CRC was 46.29±37.06 versus the mandibular 9.09±30.15 ($p < 0.05$). The CAL gain in maxillary test sites was 2.97±0.84 and the mandibular 1.85±0.77 ($p < 0.05$). The CAL gain in maxillary control sites was 3.24±0.96 and the mandibular 2.06±0.92 ($p < 0.05$). There were no statistically differences between control and test in maxillary and in mandibular defects in terms of MRC, CRC, CAL gain, KTW ($p > 0.05$).
Conclusions: Within the limits of the study, both treatment procedures result in significant reduction in Miller class III gingival recessions at 6 months. No statistically differences were found between both groups in clinical parameters. However, chair time and postoperative pain were statistically significantly lower inthe test group. There were differences statistically significantly in MRC, CRC and CAL gain between maxillary and mandibular defects in both groups. Miller class III gingival recessions may be treated successfully with both materials in the upper maxilla with high percentages of mean root coverage and even complete root coverage may be expected sometimes. The collagen matrix might represent an alternative to connective tissue graft in the treatment of Miller class III recessions.

The influence of tissue adhesive to palatal donor site healing. A prospective randomized controlled clinical trial

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Aim: Tissue adhesives (TA) are promising materials that

may improve the palatal donor site healing and patient comfort. However, there is no randomized controlled trial (RCT) evaluating the effectiveness of TA at donor site healing. The aim of this RCT was to evaluate the effects of TA on palatal donor site healing after de-epithelized gingival graft (DGG) harvesting.

Materials and Methods: The study included 60 patients who underwent PPS including DGG harvesting from the lateral palate. 30 patients were treated with TA+collagen sponge (CS) whereas 30 were treated with CS only. The variables of postoperative bleeding (BLE), pain scores (VAS), quantity of analgesics (QA), epithelialization level (EL) and sensation loss (SL) were evaluated during 28 days healing. In addition, graft height (GH), width (GW), thickness (GT), and operation time (OT) were recorded.

Results: The study was started with 60 patients. 10 patients (9 from TA+CS and 1 from CS groups) who did not attend follow-up appointments were excluded from the study. While TA+CS group showed higher GT ($p<0.001$), postoperative bleeding was less at first three days ($p<0.003$). Statistically significant difference was present between two groups in terms of VAS scores ($p<0.001$) and QA (CS; 0.31 ± 0.21, TA+CS; 0.10 ± 0.21 $p=0.002$). EL scores were similar at 7, 21 and 28 days whereas TA+CS group showed higher EL at 14 days ($p=0.042$). No significant difference was detected in terms of SL.

Conclusions: The findings of the RCT showed that TA+CS combination is an effective method for DGG donor site healing in terms of reducing postoperative pain, analgesic consumption by increasing the epithelization rate compared to CS.

Bioactive glass particles and deproteinized bovine bone mineral as scaffold in bone tissue regeneration: Effects of Minocycline-HCL

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Aim: The present study in rat was performed to determine if Minocycline could influence the behavior of Deproteinized Bovine Bone Mineral (DBBM) and bioactive glass particles when used as scaffold for Guided Bone Regeneration (GBR). Minocycline is a wide spectrum antibiotic with demonstrated effects on bone formation, bone resorption and connective tissue breakdown. We chose to investigate this molecule in relation with bioactive glasses and DBBM, both important classes of bone grafting materials.

Materials and Methods: Two completely occlusive titanium bone augmentation caps were placed on each side of the sagittal cranial suture of the rat calvaria. One was filled with bioactive glass particles (BioGran®-Biomet 3i, Plam Beach, FL, USA) and the second with DBBM particles (Bio-Oss®–Geistlich, Wolhusen, Switzerland). Bone filler particles were mixed with blood, collected from the animal's tail, and a drop of balanced salt solution in order to acquire a moldable consistency of the particles and a perfectly adapted fill of the regeneration chambers. In Minocycline-Cl group (n=10) bone grafts were additionally placed into a minocycline solution at 0.1 mg/ml prior placement. The study protocol included animal accommodation with water ad libitum, regular rat pellet with artificial light with a night and day cycle. All surgeries were conducted under strict aseptic conditions. For each observation time (4, 8 and 16 weeks) two calvaria were embedded in methyl methacrylate resin and cut in thin serial sections (100-200 µm), grounded and polished to a thickness of 20-40 µm. A Giemsa (Gross & Strunz, 1977), Paragon and a combination of Stevenel's blue with Van Gieson staining was used for light microscopy. The remaining calvaria were fixed, decalcified in an EDTA solution at 0.2 M (pH 7.4) for 30 days and dehydrated in ascending ethanol series for 96 h. The paraffin embedded blocks were sectioned (5 µm) and either hematoxylin eosin (H&E) or Toluidine blue stained for the histologic analysis.

Results: This study has confirmed osteoconductive and osteoinductive response of BioGran®. The addition of Minocycline has hardly influenced the result positively. In contact with blood, BioGran® underwent a surface modification in form of a calcium phosphate precipitate, quite similar in composition and structure to hydroxyapatite. Cracks in the outer shell were to be recognized and the silica core tended to disappear leaving a calcium phosphate pouch for future bone growth. Likewise, first signs of osteoinduction in the form of ectopic mineralization foci could be observed after just 4 weeks at some distance from BioGran® particles. These ossification islets were lined by a layer of osteoblasts for centrifugal expansion. The osteoconductivity and predictability of Bio-Oss®, are well documented. Some studies however found that Bio-Oss® inhibited new bone formation or interfered with new bone generation especially when used as an onlay graft under totally occlusive capsules in a GTR model. Our observations were similar: the major part of the biomaterial particles was embedded in connective tissue. Most of the new bone regenerated were lamellar bone formations in close contact and bonded to the DBBM particles. Islands of spontaneous ossification suggesting some osteoinductive activities could only be observed in Bio-Oss® sections treated with Minocycline. A possible correlation of these centres with the basal skull bone outside of our observation field, cannot be excluded.

Conclusions: The osteoconductive and osteoinductive properties of bioactive glass particles could be confirmed within the limitations of the present study. Minocycline-HCl may be considered as a promising complementary treatment approach and may add some osteoinductive properties to DBBM. Further investigations into the volume of the newly generated bone are needed to refine the present results.

Assessment of gingival tissue thickness using a novel ultrasound dental system

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Aim: The aim was to carry out assessments of gingival thickness (GT) with a novel ultrasound dental system (US) and compare to transgingival probing (TGP) and direct measurement with optical coherence tomography (OCT). Repeatability and reproducibility of measurements taken by US were assessed.
Materials and Methods: The study was carried out on ten porcine mandibles with a total of 160 measurement locations (ML) marked on the gingival surface 1 mm below the bone crest. At each of these sites, repeated measurements of gingival thickness (GT) were obtained by US followed by TGP. Lastly, vertical incisions were made through the marked points on soft tissues, and bone was partially exposed for OCT imaging for direct measurement. Comparison between measurement methods was tested by one-way ANOVA. Agreement between methods as well as repeatability and reproducibility of US measurements was assessed by Lin's concordance correlation coefficient (CCC) and displayed with Bland Altman plots. Interexaminer agreement of US measurements was also assessed by Intraclass correlation coefficient (ICC).
Results: Overall mean (±SD) values recorded by US, TGP and OCT were 0.804mm(±0.382), 1.526mm (±0.801) and 0.615mm (±0.228) respectively. Statistically significant differences were found between all three groups ($p<0.001$). CCC for US vs OCT, US vs TGP, and TGP vs OCT were 0.406, 0.141 and 0.061 respectively. Intraexaminer and interexaminer agreement of repeated US measurements were 0.840 and 0.484 respectively. ICC between examiners was also 0.484. CCC of repeated US and repeated TGP measurements at two time points were 0.604 and 0.530 respectively.
Conclusions: Within the limitations of this study, the novel US device obtained measurements of GT that were more accurate than a common conventional method (TGP). The repeatability of US measurements was also greater than TGP but the reproducibility could be further improved. There is great potential in the novel US device for non-invasive GT assessment.

CLINICAL CASE COMPETITION

A consolidated therapy utilizing concentrated growth factor (CGF) in membrane exposure incident: A 12 months clinical, radiographical and digital analysis

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Background: Replacing missing anterior teeth involves critical consideration for satisfactory function, aesthetics and phonetics. There are numerous disadvantages in rehabilitating anterior dentition such as case with deficiency of the buccal plate, thin gingival biotype and loss of significant alveolar bone volume.
Case report: This case describes a 45 years old woman who was missing upper right central incisor (11) due to history of trauma. The patient presented with thin ridges and fibrous tissue clinically and minimal alveolar bone on the buccal, detected by cone beam computed tomography (CBCT). Diagnostic wax-up showed possibility of elongated pontic on 11 due to insufficient volume of soft and hard tissue vertically and horizontally. The conventional approach is to add pink porcelain; however, this technique involves additional cost and rarely the prosthetic gingiva substitute can blend in well with the existing oral profile. Instead, Guided Bone Regeneration (GBR) was done on 11 using allograft (RegenOss, Neobiotech) and PTFE membrane. Upon review, exposure of the membrane detected and the size increased following reviews. Therefore, to avoid further complication, the membrane replaced with Concentrated Growth Factor (CGF) and sutured at the site of defect. After 12 months, vertical and horizontal bone with adequate soft tissue emergence profile were achieved clinically, radiographically and digitally.
Conclusions: The utilization of the CGF can be beneficial to enhance conventional method of surgical technique in GBR with almost non-existent biological cost, easily manufactured, safe technique with acceptable result. This case concludes that CGF can be a viable alternative material to enhance GBR outcome in replacing the exposed membrane.

The increase in bone's volume thanks to the use of a titanium grid fixed to the implant

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Background: The lack of appropriate bone volume for implant insertion is still a challenge in oral surgery. Dehiscence or fenestration may occur despite the achievement of a good implant primary stability. This report can support the effectiveness of a shield titanium barrier fixed to the implant, thanks to the engagement predisposed to the healing screw. This method can be considered as an alternative to vestibular or palatal fixing screws, providing a less invasive and easier surgical technique.
Case report: A 54-year old patient came to our observation for an implant rehabilitation at site 1.4. After evaluating the extension of the vertical defect the treatment involved the use of regenerative bone technique with biomaterial of bovine origin, a resorbable membrane and a titanium grid fixed to the implant and simultaneously inserted. Prior to local anesthesia with articaine-epinephrine 1:100000 a full thickness muco-periosteal flap was performed to expose the defect. Granulation tissue was removed followed by sterile saline rinsing of the site. Periosteal

releasing incision was performed to allow first intention healing with 4-0 monofilament suture. A Megagen Anyridge implant (4x8.5 mm) was placed with an insertion torque of 45N. A modified healing abutment that could support the dedicated I-GEN grid (Megagen) was inserted instead of the usual cover screw, thus stabilized the grid without any additional fixing screw. The defect was filled with deproteinized bovine bone, working as a scaffold under the grid, while preventing any blood or saliva contamination. A resorbable membrane was placed over the grid, to prevent epithelial and connective cells from invading the clot in formation. A healing period of 5 months was expected before the removal of the grid which only required the unscrewing of the dedicated healing abutment, after a small access flap without vertical release incisions. The element was then applied to the prosthesis. The follow-up is about 2 years.
Conclusions: At the two-year follow-up it was possible to evaluate the real bone augmentation obtained thanks to the use of this surgical technique. A 3 mm horizontal and 4 mm vertical bone augmentation was recorded. A titanium barrier fixed to the implant itself allows a bone augmentation given by a bovine and autologous bone graft, without having to use accessory vestibular anchoring screws. It also allows to be minimally invasive when removing the grid itself.

Chediak-Higashi syndrome: A rare cause of recurrent gingivitis

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Background: The Chediak-Higashi syndrome (C-HS) is a very rare autosomal recessive disease (Fewer than 500 individuals with C-HS have been reported worldwide in the past 20 years.) It's characterized by several systemic and oral features, such as early-onset periodontitis and premature loss of teeth. We report in this paper oral manifestations of C-HS in a 3 year-old patient and we discuss the role of platelet concentrates on gingival health because conventional treatment failed on all reported cases.
Case report: A 3year-old patient, from consanguineous marriage, had history of failure to thrive, psychomotor delay and serious recurrent infections, (ENT, lungs, cutaneous) since the age of 7 months. He had an oculocutaneous albinism (silvery hair and whitish eyebrows/eyelashes) and was diagnosed as C-HS syndrome. He was referred to our department for recurrent oral ulcers and gingivitis. Clinical examination revealed painful and erythematous generalized gingival and mucosal enlargement involving the entire maxilla and mandible. The gingiva was easily bled on touch. Despite the dental plaque control, no improvement was noticed, also in other reported cases. Treatment options are limited and the only definitive treatment is Bone Marrow Transplantation from a human leukocyte antigen-matched donor. In dentistry, platelet concentrates, took an accepted rule in facilitating wound healing, and was described to have significant effect in treating gingivitis not due to dental plaque. The understanding of their mechanism and the pathogenesis of CH-S can help finding future gingival treatment, or at least stopping the evolution that lead always to teeth loss.
Conclusions: Early death in CHS occurs due to infection or bone marrow failure. The prognosis is good if bone marrow transplantation is done before the setting of accelerated phase. The dentist has to know their oral manifestations to help to an early recognition and so an early management of C-HS, because it still the only way to prevent the preterm morbidity associated.

Multidisciplinary approach to management of multiple marginal tissue recessions associated with trauma from occlusion

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Background: Endo-perio lesions are common conditions that are often difficult to diagnose and undiagnosed trauma from occlusion can be a contributing factor. It is also essential to correct the periodontal defect simultaneously in these cases to prevent recurrence, and to improve the functional status of the tooth. Root coverage surgery must be carried out whenever concerns such as aesthetics, sensitivity, susceptibility to root caries, pulpal symptoms exist.
Case report: A 45 year old female patient reported to our OPD with chief complaint of pus discharge and bleeding gums from lower anterior teeth since one month. She gave a history of multiple endodontic therapies, apicectomies and soft tissue grafting to cover the defects. There was discoloration and attrition in mandibular central and lateral incisors bilaterally with thin and pigmented gingiva. Assessment of occlusion revealed traumatic bite in the lower anteriors. Endodontic therapy along with orthodontic treatment was initiated. After completion of endodontic and orthodontic therapy, the teeth stabilized and there was no further discharge or discomfort to the patient. The challenge now was to reconstruct the lost gingival tissues to facilitate plaque control and stabilize the periodontium. Initially

free epithelial graft from the palate was harvested and placed in relation to lower incisors to augment the attached gingiva. 3 months after the initial grafting, a sub epithelial connective tissue graft was placed to cover the defects. Subsequently. the patient was taken up for final reconstruction after 8 months and connective tissue graft using lateral stretched flap was utilized to gain root coverage in the residual recession. There was an increase in width and thickness of the zone of attached gingiva following the staged reconstruction after a successful endodontic therapy.
Conclusions: This case was challenging not only due to the multiple contributing factors but also due to presence of trauma from occlusion. The persistent endodontic lesion contributed to the destruction of the hard and soft tissues around the four incisors Successful treatment in this case can be attributed to a correct diagnosis identifying trauma , successful endodontic therapy and an increased zone of attached gingiva was established using a staged reconstruction of the periodontium.

Immediate provisional restoration in the esthetic zone: A case report

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Background: Provisional restorations inserted at the time of implant placement have been used to restore esthetic and improve patient comfort especially in the anterior sector. It has shown benefit in the preservation of interproximal papillae. It improves the healing of peri-implant soft tissues and enhances the developing of the desired contour of marginal gingiva. Therefore, immediate provisional restoration prepares soft tissues for an accurate impression and the placement of final prosthesis.
Case report: A 33 year-old non-smoking female patient diagnosed with rheumatoid arthritis (RA), treated with methotrexate and corticoids, presented to our department of dental medicine of military hospital for the esthetic rehabilitation of the missing first maxillary premolar 14. Clinical examination revealed sufficient keratinized gingiva. The radiological investigation showed an adequate bone support in height and width for an implant placement. So we have opted for implant supported prosthesis proceeded by immediate previsualization. The implant was placed with adequate primary stability. A prefabricated polycarboxylate mold was adapted to the gingival profile using acrylic resin making a customized provisional restoration. It was screw-retained out of occlusion with no centric contact or lateral excursions. After one year of uneventful osteointegration and soft tissue healing, the provisional crown was removed and the customized definitive prosthesis was placed. At the 3 years follow-up, the interdental papilla was still well supported with a stable crestal bone level.
Conclusions: Minimal invasive surgical procedures and temporary immediate restorations are steps particularly important in patient with RA to guide the healing of pre-implant tissues and avoid discomfort and complications. Meanwhile, it requires rigorous planning with careful clinical and radiological examination.

CAD/CAM full arch implant supported fixed prostheses: About a clinical case report

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Background: Total edentulism constitutes generally a handicap represented by dysfunctions of the masticatory system. Conventional complete removable prostheses allows limited functional rehabilitation, in particular to the mandible. Indeed, the masticatory capacity is weak, stability and retention are often unsatisfactory. With the advent of implantology, the implant-supported fixed prosthesis has become today the "Gold Standard" in the treatment of the complete edentulism for both arches.
Case report: A 65 year-old male patient presented with a complete edentulism on both arches. He was complaining about his ill-fitting conventional removable complete prostheses. The examination of soft and hard tissues was shown well favorable ridge on both arches. The decision was to do implant supported fixed prostheses for both maxilla and mandible. A total of eight threaded root form implants (Easy® Implant, France) were placed on each arch. the second-stage surgery was conducted and healing abutments were placed. The pick-up impressions were made using custom open trays with silicone impression material. Due to the high numbers of implants in each arch and the divergence of their axes especially on the maxilla, the transfers should be splinted with a low shrinkage acrylic resin, but the problem was the impossibility to remove the impression. This could be related to deep and solid connection of this kind of implants. In the laboratory, the titanium implant abutments were placed and adjusted regarding to their height according to the available interocclusal space and then trayed on patient. After recording the maxillomandibular relation, the titanium frameworks were designed using CAD/CAM technology, and then were processed using milling machine. Once the Ti frameworks were milled, the ceramic was applied individually to each crown substructure. Finally, after

ceramic glazing, the crowns were cemented to the abutments using a definitive cement.
Conclusions: Full arch implant supported fixed prosthesis is considered the best choice for treatment of complete edentulism. Its main advantages are less bulk, excellent patient comfort, chewing efficiency, stability, longevity of the prosthesis and positive psychological impact. However, it requires a sufficient bone level in the vertical direction and practically high cost. The use of CAD/CAM technology allows to overcome some possible errors during the different stages of laboratory and to facilitate the task of the technician with providing more security. The upkeep of rigorous hygiene and follow-up are the keys to ensure longevity of implant-supported fixed rehabilitation.

CBCT and optical 3D images fusion-based 3D planning for implant placement and root coverage treatment in esthetic zone

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Background: Comprehensive periodontal and implant surgery treatment planning results in optimal selection of appropriate surgical technique and consequently in better treatment outcomes. Fusion of cone-beam computed tomography (CBCT) and optical 3D images is routinely used in implant treatment planning aiming to provide accurate implant placement. While fused 3D image could also be used for evaluation of soft tissue thickness (Kuralt et al. 2019), this has not yet been used for treatment planning.
Case report: 42-year-old female patient was referred to Department of Periodontology, UMC Ljubljana. Examination revealed missing upper right central incisor with moderate horizontal ridge atrophy and deep gingival recession defects at both upper canines, classified as RT1 (Cairo et al., 2011). Patient was subjected to CBCT and optical 3D scan of the oral tissues. Several treatment plans were presented to patient, using Digital smile design protocol (Coachman et al., 2012). Implant placement at missing area and root coverage at both upper canines was performed. CBCT and optical 3D image were registered and virtual implant placement performed in BlueSkyBio. Additionally, 3D model from CBCT image was created. The surgical guide with the embedded sleeve was designed and 3D printed inhouse. Implant bed preparations and implant insertions were done through the surgical guide in accordance with the manufacturer's surgical protocol (Straumann BL implant, 4.1x12 mm SLActive). Buccal bone wall defect was treated with a mixture of autogenous and xenogenic bone particles (Bio-oss) and covered with a resorbable collagen membrane (Jason membrane). Initial soft-tissue thickness was evaluated aiming to select most appropriate surgical technique and palate donor site with registered 3D models in GOM Inspect 2017. Recession defects were treated with bilaminar technique (Zucchelli et al., 2007). Postoperative 3D evaluation of dimensional changes at treated recession defects and implant site was performed.
Conclusions: Comprehensive implant treatment planning using 3D approaches, i.e. Digital Smile Design and fusion of multimodal 3D images, and implant guided surgery provides highly accurate implant placement and predictable esthetic outcome. Fused 3D image further expands the possibilities for precise measurements of soft tissue thickness and dimensional changes over the areas of treated gingival recessions defects and implant sites.

Maxillary full arch: Immediate loading of six implants with guided bone regeneration

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Background: Immediate placement and immediate loading both known a craze the past fifteen years and many clinical studies have validated these two protocols. From a decade, some teams have combined the two concepts to develop the immediate placement with immediate loading. However, replacing multiple teeth can be especially complicated due to the loss of surrounding structures, often making it necessary to use additional procedures to solve the problems that arise as guided bone regeneration.
Case report: A 58 years old patient with no systemic disease consulted in our department for prosthetic rehabilitation in maxillary arch. We told him about the different therapeutic possibilities; conventional immediate prosthesis, removable and fixed implants retained prosthesis. Clinical and radiological exams showed that patient present a generalized periodontitis with lack of bone around the teeth. After prosthetic analysis and oral consent of the patient we decided to put 6 implants on the maxillary arch with guided bone regeneration and immediate fixed provisional bridge. Firstly, the preparations for surgery were performed according to standard protocols. Surgical procedures were performed under local anesthesia. Then residual teeth were extracted. Next, six implants were placed in the residual bone and in the extraction sockets, achieving primary stability. Subsequently, a mixture of autogenous bone derived from the drilling of the

implant beds and a xenogeneic bone graft was inserted at the level of the concavity present in the alveolar vestibular table. Finally, the mucoperiosteal flap was adapted and sutured with primary closure to allow healing. the patient received antibiotic therapy, anti inflammatory agents and mouth rinse were prescribed for 1 week. after 24h we put in place the immediate provisional fixed prosthesis.
Conclusions: The extraction of residual teeth and placement of implants in the same surgical procedure represents a successful approach to minimizing the treatment time without reducing predictability with regard to standard protocols, especially in the rehabilitation of patients with full fixed prostheses. Moreover, for those patients who refuse to go through a removable prosthesis and a period of complete edentulism, aesthetics is a very important factor from which we must firstly ensure an aesthetic result and keep it over time. This is ensured by a good management of hard and soft tissue. Finally, good management of hard and soft tissue using proper surgical procedures are the keys for the success of our aesthetic results and the sustainability of our immediate implant.

Treatment of periodontitis: When is it time for mucogingival surgery?

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Background: Periodontits is an inflammatory disease characterized by the destruction of the supporting dental tissues. The objective of periodontal surgery is the creation of an easily maintained periodontal environment. This condition is often associated with unaesthetic and functional tooth migration requiring orthodontic treatment. The use of periodontal plastic surgery improves aesthetics and corrects defects in the morphology that can accelerate the course of periodontal disease.
Case report: A 44-year-old woman was referred to the periodontal office of our hospital in 2013. The patient's chief complaint was her dental appearance, impaired function and the loss of the lower central incisor. Generally, the patient was suffering from systemic lupus and taking Plaquinine®, she was no smoker. Clinical examination revealed an atypical deglutition. The 31 was extracted following grade III mobility. Based on a complete periodontal examination the diagnosis was stage II grade A periodontitis. The patient has a thin biotype with multiple recessions. Treatment planning included anti-infective periodontal treatment followed by orthodontic treatment to correct the secondary migration of the anterior teeth. Orthodontic treatment was started after the stabilization of the periodontal lesions. Astringent hygiene care regimen was enforced to control bacterial contamination. supra and sub-gingival debridement of the whole dentition was delivered before active movement intervention throughout the orthodontic treatment phase monthly. During orthodontic treatment, sites with reduced attached gingiva received a free gingival graft. After 3 years of treatment, the appliance was removed but the periodontal treatment continued and type 2 (Francesco Cairo an coll. 2011) maxillary recessions were treated with the Zucchelli Technique to perform the thickening of the periodontal biotype and to cover the gingival recession associated to non-carious cervical lesions.
Conclusions: The treatment outcome highlights the absence of periodontal disease progression between the beginning and the end of treatment. This result was achieved through a closely controlled and fully planned multidisciplinary therapeutic process requiring meticulous periodontal monitoring throughout orthodontic treatment. When there is insufficient available keratinized tissue, orthodontic treatment on a reduced periodontium would increase the risk of periodontal destruction. Thus thickening of the periodontal morphotype is needed before orthodontic treatment. Whereas gingival recession coverage is done after the orthodontic treatment because the correction of tooth migration can lead to bone increase and consequently enhance the results of tooth coverage. Zucchelli's technique is effective for the treatment of multiple adjacent recessions in terms of both root coverage and keratinized tissue gain.

Subepithelial connective tissue graft in combination with enamel matrix derivative proteins for the treatment of multiple Miller class III gingival recessions in anterior maxilla during orthodontic treatment in combination with piezocision-assisted technique

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Background: Today coronally advanced flap (CAF) with subepithelial connective tissue graft (SCTG) is considered the gold standard treatment to achieve complete root coverage and keratinized tissue width in gingival recessions. Recently, enamel matrix derivatives proteins (EMDs) have been used due to their regenerative potential. The addition of EMDs to the conventional therapy seems to contribute to the healing of soft tissue without scarring or at least to minimize them.
Case report: A 32-year-old female, with no systemic pathology, presented an anterior open bite, bilateral

posterior cross bite and multiple Miller class III gingival recessions. In the periodontal examination, according to the clinical symptoms (high probing depths with bleeding on probing) and radiographic signs (bone loss, furcation lesion), the diagnosis of periodontitis stage III, grade C was established After periodontal treatment the periodontal health was achieved and the orthodontic treatment began. In order to obtain a better vascularization of the soft tissues and subsequently of the surgical flap, 6 months were necessary until the interproximal conditions of the anterior superior incisors were improved. At this moment, a tunnel mucogingival technique was performed including SCTG harvested from palate by UPV/EHU technique and EMD proteins. Corticotomy have been proposed to reduce orthodontic treatment time and promoting tooth movement. A piezoincision-assisted technique was performed and in the same surgical procedure, a tunnel technique was again performed in the anterior maxilla to advance coronally the soft tissue previously obtained After 24 months of orthodontic treatment a stable occlusion was achieved with periodontal health. Concerning to the multiple Miller Class III gingival recessions, although complete coverage was not obtained, high percentage of root coverage with gain of keratinized tissue width was achieved.

Conclusions: The corticotomy was realized to reduce orthodontic treatment time and promoting tooth movement in adults; a piezocision-assisted technique was the election to reduce the morbility. In some cases previously to a mucogingival surgery orthodontic treatment is necessary to change the malposition of the tooth in order to improve the vascularization and so, improving the prognosis of the tooth. There are many studies about enamel matrix derivatives (EMDs) due to their regenerative.

Combination of periodontal therapy and orthodontic movement for root coverage in a Miller Class III recession

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Background: Gingival recession (GR) can compromise the esthetic appearance, leading to functional problems, hypersensitivity and root caries susceptibility. Several surgical procedures have been developed for its treatment. It has been widely demonstrated that root coverage of shallow Miller class I and II recessions is generally predictable, but the treatment of deep Miller class III recessions, especially those associated with lack of keratinized tissue, could make the root coverage challenging.

Case report: A 39-year-old, systemically healthy female attended at the Department of Periodontology, University of Hassan II, Morocco. She complained of dentine hypersensitivity and aesthetic involvement related to tooth 21. Upon clinical examination, a Miller Class III GR was detected on the buccal aspect of the tooth 21. After initial therapy, the treatment had consisted of a periodontal plastic surgery including a laterally positioned flap with connective tissue graft. Three months after surgery, the healing was sufficient to initiate orthodontic treatment. Throughout the duration of orthodontic treatment, the increased keratinized attached gingiva appears to provide continued stability, increased resistance to external injury and contributes to the stabilization of the gingival margin. Moreover, the orthodontic therapy improved the outcome of the connective graft technique under lateralized flap.

Conclusions: This case report illustrates the positive outcome of the multidisciplinary approach in the management of a class III GR. From a clinical point of view, the mucogingival surgery allowed increasing the width of keratinized gingiva band and the orthodontic treatment resulted in reduction of the GR. The patient, provided with periodontal and orthodontic procedures, was pleased with the outcome of this combined treatment.

Orthodontic extrusion with magnets of a hopeless tooth

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Background: Horizontal fracture of the tooth extending below the margin of the alveolar bone is prosthetically difficult to manage without preparatory procedures. In order to make a suprastructure on the root a ferrule has to be achieved by surgical crown lengthening, surgical root extrusion or orthodontic root extrusion. Simple and fast method is orthodontic extrusion of residual root using magnets. This type of extrusion is also suitable for implant site development of hard and soft tissues.

Case report: An example of extrusion with magnets is shown in a 34-year-old patient. Teeth 22 and 23 were treated after injury in 2001. They were provided with a fixed prosthetic construction under which a secondary carious lesion occurred on tooth 23. As a result the tooth fractured deep below the gingival margin what lead to defects both in hard and soft tissues between both teeth. Due to the long and endodontically well-filled fractured root 23 decision was made to try preserving the tooth

and put it to function. We opted for orthodontic extrusion using magnets. Treatment was divided in few appointments. Goal of first appointment was to achieve a biologically healthier situation of the area between teeth in order to cement the magnet to the root during the following appointment. Patient underwent dental hygiene procedure and received detailed instructions for performing mechanical cleaning and the use of mouthwash with 0.12% CHX. Next appointment included positioning of the magnet to the root, fibrotomy around the root and adjusting the second magnet with 1mm distance opposite from the first one, that was attached to an essix. The patient was instructed to wear it at all times. 7 days later magnets came into contact which meant the root was extruded for 1mm. With a help of a spacer a readjustment of the magnet was made so that there was again another 1mm to achieve by next 7 days. Further sessions were conducted in 7-day intervals until the desired extrusion was achieved.
Conclusions: In this case the extrusion obtained 4mm of bone in the apical region of the fractured root. The ferrule effect has been achieved and it was possible to finalize the treatment prosthetically with a post and crown. In addition, soft tissues followed the extrusion and are expected to maturate more. Hard tissues level improved since beginning of the treatment and is continuing to improve. Extrusion with magnets is safe and biologically sound procedure to extrude teeth. In cases where roots are strong and well endodontically treated it could give a tooth a second chance. In cases where roots are not strong enough to carry prosthetical part and stay in function, it can be a great tool to boost the bone foundation and soft tissues prior implantation.

Combined connective tissue platform technique and resective surgery for implant complication treatment in esthetic area

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Background: Post-extraction alveolar ridge deformities may complicate prosthetic rehabilitation around teeth and implant, compromising esthetic , function and localized oral hygiene. Soft tissue modification-augmentation is a key factor to compensate ridge deformities even more in pontic edentulous areas, where implant is not required. This case shows a combined use of two mucogingival techniques to treat a young patient with an implant failure in esthetic area.
Case report: At first visit a 19 years old patient came to our office for pain and swelling on a not restored implant placed by another colleague on upper left central incisor one year before: Implant showed bleeding on probing, purulence and movement, clinical evidence of integration lost. Patient wasn't happy about esthetic, showed an altered passive eruption, a wide mesio-distal prosthetic space in correspondence of upper left central incisor, vestibularization and rotation of the upper left lateral incisor and a soft tissue concavity and bone loss on the upper left central incisor. After implant removal, we treated patient with orthodontics in order to gain a correct prosthetic space on missing tooth and to modify upper left lateral incisor position. Two years after orthodontic treatment we decide to modify soft tissue thickness at central incisor site with double connective tissue graft and to treat altered passive eruption to improve the length of adjacent clinical crowns; In a first step we open a full thickness flap in correspondence of neighbors teeth and split thickness in the graft area; Due to the initial coronal displacement of the flap, after 2 months we reshaped gingival margin with a little diode laser gingivectomy to complete crown lengthening procedure and improve teeth esthetic appearance; 4 months after, a PMMA provisional Maryland bridge was placed and after soft tissue conditioning we inserted a zirconia-ceramic Maryland bridge restoration.
Conclusions: After final restoration insertion, patient was extremely satisfied; she showed a natural smile, with a good soft tissue blending and harmonic gingival margin; Ceramic Maryland bridge was very stable and patient liked color and shape. Modern adhesive techniques are not provisional solutions to replace missing teeth and due to the relationship modification between implants and teeth in esthetic area year after year (even more in young patients), soft tissue improvements and adhesive restorations are valid solutions to replace missing teeth in esthetic area. In this case the appropriate use of mucogingival techniques allowed us to treat simultaneously altered passive eruption and soft tissue gap, reducing number of surgeries and treatment time (probably less than implant placement with a bone and soft tissue reconstruction) and we improved esthetic appearance too, with high patient satisfaction.

Management of peri-implantitis with bone loss by soft tissue and prosthetic management

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Background: Peri-implant keratinized tissue is important in maintaining both functionality and esthetics. It enables good oral hygiene maintenance without irritation or discomfort, supports the long term implant stability, facilitates impression making procedures and provides

a prosthetic friendly environment. In this case peri-implantitis with bone loss around two implants was treated solely by creating a peri-implant wide zone of keratinized gingiva and subsequent prosthetic management.
Case report: Patient presented with a defective prosthesis and peri-implantitis with bone loss (evident from CBCT and probing) around two implants placed in the upper posterior maxilla. Total absence of keratinized tissue was noted. Probing depths of 7 mm at the anterior implant and 4 mm at the posterior implant with bleeding on probing as well as high frenal attachment were found. The implants were stable (ISQ= 90). A partial thickness incision was performed for creating a connective tissue bed for the free palatal graft. The partially incised mucosa was sutured apically to the underlying periosteum for sulcus deepening. Implantoplasty was done with a coarse diamond stone. A free gingival palatal graft was harvested and sutured to the underlying recipient bed and stabilized with horizontal mattress sutures. Healing demonstrated the creation of a wide band of keratinized peri-implant mucosa firmly bound to the underlying fixtures. Probing depths improved from 7mm and 4 mm to 2.5 mm on both implants after 2 months of healing. Fixtures and abutments were prepared to have the FP3 prosthesis margins on the coronal 2 mms of the fixtures.
Conclusions: Peri-implantitis is one of the most challenging conditions to deal with in dental practice. From this case we conclude that soft tissue and prosthetic management are enough for the management of peri-implantitis around non mobile implants presenting with lack of peri-implant keratinized tissue and other local factors such as high frenal attachments. We believe that if these issues are properly addressed, it might be possible to avoid the relatively more unpredictable bone grafting in peri-implant cases.

White and pink aesthetics obtained through a mucogingival surgery and prosthetic restorations performed by biologically oriented preparation technique

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Background: Modern dentistry aims to achieve functional and aesthetic results preserving healthy dental tissue through a minimally invasive approach. To achieve this goal, we set-up a treatment plan focusing on the harmony between white dental aesthetics and pink gingival aesthetics, to restore the best smile. After a correct diagnosis, we performed few steps using: a mucogingival surgical approach, gingival recontouring and prosthetic rehabilitation with a Biologically Oriented Preparation Technique.
Case report: A 55-year-old non-smoker ASA I male patient came to our dental office to improve the aesthetics of his anterior teeth. The extraoral and intraoral physical examination showed a fairly symmetrical face, a smile with a correct relation with the lower lip line, and the presence of multiple gingival recessions on teeth 12,11,21 and a deep one on an implant in the 22 position. Periodontal parameter registration, preliminary impression of the dental arches, optimal wax-up allowed the first provisional shell for teeth and implant. The substitution of the original metallic screw-abutment with a new individual and thinner one, was followed by the removal of the old metallic dental bridge. The teeth were prepared with the Biologically Oriented Preparation Technique (BOPT), directly rebasing the first provisional teeth. After the maturation of the interproximal gingival tissue around the new screw abutment in site 22, we performed a bilaminar coronally advanced flap (CAF+CTG) to improve the coverage of the recession. During the healing and the coronal creeping of the gingival tissue, a singular gingivectomy was performed on the 11 element to raise and improve this gingival parabola. A second better provisional crown rehabilitation with an optimal symmetrical distribution, obtained with a good tissue stimulation and a new correct emergence teeth profiles (BOPT), leads to a final prosthesis restoration with an optimal aesthetic successful result in eleven months.
Conclusions: Aesthetic success can often be achieved by multidisciplinary therapies, improving the morphology and spatial arrangement of teeth and gingival architecture. The balance between pink and white areas will be obtained with correct and symmetrical spatial architecture of all components: gingival color and surface, height of gingival parabolas, respecting of the biological width with an adequate quantity and thickness of keratinized tissue. Mucogingival therapy, started with a new implant abutment, the bilaminar technique (CAF+CTG) and gingivectomy for soft tissue management, is linked to an optimal prosthetic preparation (BOPT Technique). This preparation without finishing line allows the formation of a new anatomic crown and gingival sulcus, reprogramming and modulating the soft tissue and the emergence profiles. Only this complex therapy will bring the clinician to a functional and aesthetic optimal result, with full patient gratification.

The effects of erythritol and glycine air polishing in supportive periodontal therapy

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Background: Accumulation of bacterial deposits on teeth is the primary cause of periodontitis and the removal of such deposits is fundamental in the treatment of this disease. Bacterial deposits can be removed by "air-polishing", a technology that allows to clean or polish a surface with a jet of compressed air containing an abrasive powder. The main purpose of this case is to evaluate the effectiveness of repeated air-polishing with glycine powder or with a new erythritol powder during maintenance therapy.
Case report: The original material used in air polishing was sodium bicarbonate which could cause severe gingival erosion and substantial root damage. Contrarily, the more recent glycine has shown immunomodulatory, anti-inflammatory and cytoprotective effects on periodontal tissues, which makes it an excellent material for periodontal air polishing. Previous studies have demonstrated that glycine air polishing can save half the time of treatment and double the comfort if compared with ultrasonic scaling and polishing with rubber-cup. Erythritol containing 0.3% chlorhexidine can also be used instead of glycine powder. This newly introduced powder has a finer grain size and might be even more tissue friendly than glycine. Erythritol, a sugar alcohol (polyol), is a non-toxic, chemically neutral and water-soluble agent that is used as a food additive. The effect of one round of subgingival air polishing with erythritol powder on BOP+ has been evaluated. After 3 months, the bleeding tendency was significantly lower, however showing no difference compared to control treatment (standard ultrasonic scaling and rubber-cup polishing). No signs of inflammation, complications or allergic reactions in form of swellings or redness of the surrounding soft tissues has been observed, and the patient tolerated the test better than the control treatment.
Conclusions: Supra- and sub-mucosal debridement was accomplished using glycine and erythritol powder, which turned out to be less abrasive to soft tissues than sodium bicarbonate. In conclusion, it must be emphasized that air polishing wasn't associated with any collateral effects (e.g. emphysema formation), thus demonstrating clinical safety for debridement in mucositis and peri-implantitis sites. Furthermore, glycine and erythritol air polishing have been proved to be safe, comfortable and timesaving.

Hard and soft tissue regeneration in an esthetic area in peri-implant defect

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Background: Peri-implantitis is a pathological condition, characterized by inflammation in the peri-implant connective tissue and progressive loss of supporting bone. Recent systematic reviews have reported that regenerative surgical treatment can result in improvement in probing depth reduction, BOP and radiographic evidence of defect filling. As for the procedures to rebuild soft tissues, autogenous connective tissue graft is considered the gold standard.
Case report: 50-year-old female patient who periodically attends periodontal maintenance. In a maintenance appointment a longitudinal fissure is diagnosed in 2.3. Although the immediate extraction of the tooth is indicated, the patient decides to keep it. Two years later, an abscess is observed clinically in said tooth and an involvement of the implant on 2.4, that is diagnosed as a peri-implantitis. Extraction of 2.3 was performed. Two months later an implant was placed and at the same time a regenerative surgery of the implant 24 using a bone substitute (Bio-Oss) together with a double resorbable collagen membrane (Bio-Gide) was performed, releasing the flap through the incision of the periosteum to allow its coronal displacement. It was sutured with a non-absorbable monofilament (GORE-TEX). At 3 months the resolution of the peri-implant disease can be observed with a radiographic filling of the infraosseous defect and the exposure of the supraosseous spires. In order to correct the soft tissue deficiency, it is decided to perform a palatal connective tissue graft with a subperiosteal tunnel technique with lateral access. When evaluating the results at 12 months, it presents a favorable aesthetic appearance, achieving an equalization of the adjacent peri-implant contours and giving the patient high satisfaction.
Conclusions: This clinical case shows that that regenerative surgery using a xenograft with a collagen membrane, together with mucogingival surgery can be a successful alternative for the treatment of hard and soft tissue defects in the treatment of peri-implantitis, generating great satisfaction from the aesthetic point of view and integration of the neighboring pieces at 1 year of observation. The predictability of success at the level of health, function and aesthetics lies in making a correct diagnosis and executing a good treatment

plan. Therefore, we can conclude that the treatment of lesions associated with peri-implantitis in the anterior sector is a challenging situation for the clinician, who needs to address altogether the deficit of bone tissue and the peri-implant mucosa.

Biological Papilla Preservation Technique BPPT. Tunneling technique for periodontal regeneration: Case series

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Background: The objective of the study is an alternative surgical approach to improve the safe use of free incision technique used for periodontal tissue regeneration surgery. Tunneling technique for periodontal regeneration. Preservation of a sufficient vascular supply is essential to ensure survival of the elevated flap. An incision free flap and then a gently elevation flap for an improved esthetic outcome due to a minimized risk of prospective scar tissue formation.
Case report: Before surgery we waited at least 6 months after the non surgical periodontal treatment The use of magnification and micro instrument, mini micro blades, mini five curettes, tunneling surgery instruments, micro alveolar spoon, sonic and ultrasonic instruments and PTFE 6/0 sutures. The width of the interdental space is at least > 2 mm. The incision all around for the buccal part of the tooth near to defect and to elevate a gently full thickness flap with initial 4 mm and a spilt thickness flap at least 3mm until to have a passive flap without tension close to the intrabony defect. After elimination of inflammatory tissue and cleaning the defect, we can used biomaterial for periodontal regeneration. Enamel matrix protein and bone chips were used as biomaterials in these case series. The suturing phase is developed with a cross suspended suture to stabilize the surgery site with thick gingiva biotype, while in case of medium biotype it's better a double cross link suspended suture. In case of furcation we can use two concentric suspended sutures with peripheral different distance. Effect of tissue regeneration surgery with free papillary incision technique shows a preservation of blood vessels for a better healing and an immediately post the surgery comfort for the patient. After fifteen days we noted a better healing of tissues in the area of the surgery.
Conclusions: This technique with free papilla incision is a method to improve healing for periodontal regeneration preserving as possible the blood supply and improving esthetic outcome achievement of wound primary closure.

M-Mist Surgery: Case report

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Background: The M-MIST was designed to improve flap stability, maintain space for regeneration and preserve an increased portion of the blood supply at the level of the crest and the papilla. The aim of this study is to preserve a sufficient vascular supply that is essential to ensure survival of the elevated flap and show that an M-MIST flap and a gently elevation flap should be considered for an improved esthetic outcome due to a minimized risk of prospective scar-tissue formation.
Case report: Before performing surgery we waited at least 6 months after the non surgical periodontal treatment. We performed the preservation flap with the support of magnification and micro instrument, mini micro blades, Prolene 6/0 sutures, mini five curettes. The surgical approach consists of a limited interdental incision in which only a buccal triangular flap is elevated, while the papilla is left in place, connected to the root of the crest-associated tooth with its supracrestal fibres. The palatal/lingual tissues are not involved in the surgery. The Patient is female, 55 years, probing depth 9 mm. We performed the surgery with a M-MIST approach. An intrasulcular incision at tooth 3.2 was done, crossing the papilla at his base, because we have >2mm distance between the teeth, and again intrasulcular incision around the element 3.3 without vertical incision. We start the reflection of flap with micro instruments to clean and remove inflammatory tissue too. We used ultrasonic instrument and mini five manual curette. During the manual phases we used H2O2 solution and Clorexidine 0,2% to clean into the intrabony defect. We decided to use a mix of biomaterials: Enamel Matrix Protein and Bovine Bone, with some autogenous blood too. We performed a Laurell Gottlow suture with a Prolene 6/0 to close the wound.
Conclusions: Effect of tissue regeneration surgery with M-MIST papillary incision technique shows a preservation of blood vessels for a better healing and an immediately esthetics healing achievements during the following weeks. Radiographic control also shows a visible gain, as periodontal stability. The M -MIST is not always applicable, when a defect wraps around the lingual aspect of a tooth, elevation of the interdental soft tissues becomes necessary and a Minimally Invasive Surgical Technique (MIST) becomes the preferred approach.

Ortho-perio integrated treatment in a periodontally compromised patient: A case report study

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Background: Reduced periodontal support is a challenge that clinicians often face during rehabilitation of compromised dentition. The close and intricate relationship between the periodontal tissues and the processes of tooth movement suggest that adjunct orthodontic therapy may play an important role in overcoming these problems.
Case report: A 43-year-old patient is diagnosed, by clinical and radiographic examination, with a vertical 8 mm mesial defect to the element 11 and the presence of a diastema between the elements 11 and 21. The initial procedure is non-surgical periodontal treatment hygiene sessions, scaling (ultrasound) and root planing (root planing). Subsequently after three months periodontal regeneration is performed with modified papilla preservation technique (MPPT), since the interdental space is > 2mm. After the cleaning and removal of the granulation tissue of the defect, deproteinized bovine bone (DBB, Bioss S Geistlich) and derivative of the enamel matrix (EMD, Emdogain Straumann) have been applied. Primary closure was achieved with a 5/0 EPTFE suture. Six months after surgery, orthodontic treatment is performed, with the aim of promoting bone remodeling and improving aesthetic function. It was planned to close the diastema between items 11 and 21. A bone gain of 4 mm was obtained 7 months after the MPPT surgery with the current orthodontic treatment. Clear aligners (Invisalign®) was used for orthodontic treatment. Orthodontic treatment plan was carried out through intraoral scanners and 3D graphics software (ClinCheck®). A light treatment of 14 clear aligners of the upper arch only has been selected as suitable for the patient. The patient was instructed to wear them for 20/22 hours a day and replace the mask of the progressively next number every 14 days.
Conclusions: The therapy has given the desired results. The prognosis of element 1.1 is favorable thanks to the quarterly supportive periodontal care program (SPC) and the home oral hygiene instructions explained to the patient. Multidisciplinary therapies optimize quality of the final result in an increasing number of patients; In this area, the potential of orthodontic treatment, allows to achieve higher level of care goals thanks to the improvement of the condition of periodontal tissues, should always be evaluated. Orthodontic literature presents different types of treatment for the management of adult orthodontic patients with mild to moderate bone loss. All experienced clinicians agree that a well-aligned dentition may be more conducive to periodontal health than a crowded dentition.

Modified-Minimally Invasive Surgical Technique to treat multiple adjacent intra-bony defects: A 1-year follow-up case report

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Background: Regeneration of lost periodontal tissues has been the ultimate goal of periodontal therapy. There are recent advances in periodontal surgical techniques, the focus of surgical access has shifted to regeneration of lost tissues. With the popularity of minimally invasive surgery (MIS) in periodontics, numerous publications have evaluated the benefits of MIS with or without various regenerative biomaterials in the treatment of periodontal intra-bony defects.
Case report: A 44-year-old male patient, non smoker, sistematically healthy, was apply to the our clinic with a chief complaining pain and swelling. The clinical parameters were measured probing pocket dept, recession, and clinical attachment level. The patient was surgically accessed with the M-MIST. The M-MIST proposes an approach in which the access to the bone defect is gained through the elevation of a small buccal flap, without elevation of the interdental papilla. Only a buccal flap was raised while the interdental papilla was left in site. The granulation tissue filling the defect was removed, leaving the interdental and palatal tissues untouched. Root and defect debridement were performed by using hand and ultrasonic instruments. After then, application of the regenerative material with collagen membrane and xenograft material were performed. Primary closure of the flaps was attained with a single internal mattress suture. Results: Early wound healing was uneventful and primary wound closure was attained and maintained in this defect. Postoperative evaluations revealed significant reduction in PPD. The patient was evaluated at baseline, 2, 4, 6, and 12 months. CAL gain for #35 and #36 were 5mm and 6mm at the end of 12 month, respectively.
Conclusions: The result of this case suggests that the treatment with a combination of guided tissue regeneration and demineralized bone graft led to a significantly favorable clinical improvement in periodontal intrabony defect 6 month after the surgery.

Treatment of multiple recessions associated with infraosseous defect

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Background: Certain movements during orthodontic treatment may lead to root resorptions as well as future recessions in some patients. To prevent them or its progression and improve the prognosis of the affected teeth, as well as the stability of the soft tissues in the long term, different mucogingival surgical techniques can be used. The aim of this clinical case is to achieve root coverage of multiple gingival recessions associated with an infraosseous defect after orthodontic treatment.
Case report: We present a 26-years-old patient that shows a recession type RT2 associated with a infraosseous defect after orthodontic treatment in the upper right canine and in the upper right premolar. In addition, the canine present an external resorption which was treated previously to the surgery. In CBCT it can be observe that the canine has an excess of positive torque and without buccal cortical plate in the coronary third of the root. For the treatment of the recessions it was performed a coronal advanced flap without vertical incisions in combination with a connective tissue graft and enamel matrix derived proteins.
Conclusions: The use of a connective tissue graft in combination with enamel-derived proteins is effective in the long term in achieving root coverage and soft tissue stability, as well as for gaining clinical attachment level.

Periodontal regeneration with only EMD: SFA/M-MIST vs CTG Wall technique

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Background: After the clinical and radiographic examination, the following periodontal diagnosis was elaborated to a 49-years old woman: - Periodontitis, stage III, generalized, grade C - Multiple gingival recessions According to this diagnosis, the patient received OHI, full-mouth SRP and an antiseptic mouthwash (2 weeks, 2x day, CHX 0.12%+ CPC 0.05%). At the 6-weeks re-evaluation, still 2 PPD ≥ 6 mm or more (BoP-) were present at the distal aspect of #32 and #42, both associated with an intra-bony defect.
Case report: Tooth #32: SFA/M-MIST The defect interdental papilla was incised with a MPPT and the flap raised. The granulation tissue was then removed, and the tooth surfaces instrumented. Then, EDTA and - after rinsing - EMD were applied. Finally, a single modified internal mattress suture (6-0 Supramid) was positioned at the defect-associated interdental area. At 7-months, no increase in gingival recession neither a loss of interdental tissues was visible. A reduction of 5 mm of the PPD, a gain of 5 mm of CAL and almost a complete radiographic defect fill were present. Tooth #42: CTG wall technique A CAF was designed from #41 to #46, while the defect-associated interdental papilla was incised with a SPPT. The buccal flap was raised split-full-split. The defect-related granulation tissue was then removed, and the tooth surfaces instrumented. Then, EDTA and - after rinsing - EMD were applied. A CTG was then sutured with single interrupted 6-0 PGA sutures. Sling sutures were used to suture the CAF, while the defect-associated interdental space was sutured by means of a horizontal mattress suture at the base of the simplified papilla, a vertical mattress suture and a simple suture (6-0 Supramid). At 6-months, a reduction in recession was visible on #44 and #43. Moreover, there was 1 mm gain in the defect-papilla. A reduction of 4 mm of the PPD, a gain of 5 mm of CAL and a complete radiographic defect fill was present. Moreover, some supra-crestal radiographic bone gain seems to be present.
Conclusions: At the 6-months evaluation, both the surgical techniques showed very favorable outcomes for intra-bony defects treated with only EMD. The biological role of different flap designs and of the addition of connective tissue grafts should be further investigated to try to go beyond the current limits of periodontal regeneration.

Implant placement in alveolar ridge preservation (ARP) site: Clinical and histological finding

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Background: Reduced dimension of alveolar ridge following tooth extraction can increase complexity of implant treatment and negatively affect treatment outcome. ARP with open healing using hidden X suture was reported to minimize ridge resorption, loss of keratinized mucosa and change of mucogingival junction. Furthermore, innovative suture technique named 'flap-folding suture', which presses buccal mucosa apically, enables to keep thick keratinized

tissue and to stabilize the flap for the optimal healing.
Case report: The aims of the present report were to histologically assess the hard tissue formation after ARP with open healing approach and to clinically investigate the soft tissue alteration after hidden X suture and 'flap-folding suture'. A 58-year-old female patient visited to Dankook University Dental Hospital with swollen gum in #37 tooth and apically advanced periodontal lesion was observed. Extraction socket was grafted with demineralized bovine bone mineral (Maxpore®, SigmaGraft, Fullerton, CA, USA), covered with a native bilayer collagen membrane (Bio-Gide®, Geistlich Pharma, Wolhusen, Switzerland) in double-layered fashion, and secured using hidden X suture technique without primary flap closure. After 4 months, crestal incision was performed after trephination of tissue specimen. Bone-level implant (Luna, Shinhung Co., Seoul, Korea) was placed with healing abutment connection. The flap was closed using 'flap-folding' suture technique. The tissue specimen was stained using Masson trichrome staining for histologic observation. The patient was followed up 1-year after delivery of final prosthesis.
Conclusions: Histological analysis of trephined tissue specimen shows dense collagenous tissue formed under the epithelium. Newly formed bone appears to sprout from the underlying native bone and surrounds particles of bone grafting material. Clinically, hidden X suture in combination with ARP maintained buccolingual width of alveolar ridge and keratinized mucosa for implant placement. Also, 'flap-folding suture' was helpful for pressing buccal flap and ultimately increasing volume of buccal peri-implant mucosa. In conclusion, ARP in combination of suturing technique such as hidden-X suture or 'flap-folding suture' is effective for maintaining hard and soft tissue after extraction for implant placement.

Comparative histological and radiographic evaluation of alveolar ridge preservation in esthetic zone using Concentrated Growth Factors associated with denaturated albumin (Alb-CGF) and albumin-coated bone allograft

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Background: Post-extraction alveolar ridge resorption present a challenge in upper anterior esthetic zone. Anterior maxilla present higher degrees of resorption. Socket grafting have been widely used and many studies have been conducted to examine the effectiveness of several biomaterials. Searching for available, cheap and effective biomaterials to be used in ridge preservation and regenerative represent a great field for investigation and research, especially in blood extracts and platelets concentrates.
Case report: A 33 years old patient presented with remaining roots of maxillary central and lateral incisors. Upon radiological examination, we found there was labial bone dehiscence in both sockets (type II socket). He asked for delaying the implant placement for a while. Upon his wish, we delayed the implant placement and preserve the socket to compensate and to regenerate the labial bone dehiscence. Extracting the remaining roots and preserve sockets by albumin coated bone allograft for the central incisor and concentrated growth factors associated with denaturated albumin (Alb-CGF) for the lateral incisor socket. We augmented the left central incisor socket with allograft bone while the left lateral incisor socket with Alb-CGF only. After 4 month, clinical, histopathologic and radiographic evaluations revealed clinically excellent soft tissue healing. A flap was elevated and two bone specimens were harvested using trephine drill for histopathologic evaluation and then the drilling sequence for implant placement were carried out. Histologically, section of allograft site examined under light microscope revealed considerable cancellous bone formation, resulting in relatively wide bone trabeculae with numerous viable osteocytes. The bone marrow spaces revealed proper vascularity. The other extraction socket where Alb-CGF was applied revealed still favorable cancellous bone formation. Thin bone trabecules are formed around relatively large red bone marrow spaces with viable vascularity.
Conclusions: The Alb CGF is a promising biomaterial, which was proved that it is capable of both immediate and prolonged release (after 1 week) of important GFs related to tissue regeneration such as PDGF, VEGF, and FGF. It may also represent an important step toward the development of autologous moldable and stable biomaterials for use as soft tissue barriers and potential for different applications in the oral cavity, as in periodontal regenerations.

The adjunctive effect of a connective tissue graft on single immediate implant placement: A case report

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Background: Immediate implant placement (IIP) leads often to inadequate aesthetic outcomes. Placement of a connective tissue graft (CTG) concurrent with IIP may contribute to the stability of gingival level and the augmentation of soft tissue contour. However, it

is unknown whether CTG can compensate for bone resorption and maintain the buccal bone plate over time. This case report describes the assessment of volumetric hard and soft tissue changes 6 months (6M) after IIP with CTG.
Case report: A 38-years-old woman was referred to the Department of Dentistry of San Raffaele Hospital with a history of trauma and fractured maxillary left first premolar, where the fractured coronal segment was lost. Intra-oral clinical and radiographic examination (CBCT) revealed a vertical root fracture line below the cementoenamel junction, adequate alveolar bone and absence of periapical pathology. So, it was decided to extract the tooth and to place an implant immediately with an adjunct of a CTG. A split-full-split thickness envelope flap was elevated, the tooth was extracted and the IPP procedure was carried out. A CTG, harvested from the palate, was sutured to the base of the anatomical papillae. The buccal flap was coronally advanced and adapted to the healing abutment. A temporary Maryland bridge was delivered to the patient and follow-up evaluations were performed at 7, 14, 30, 90, 180 days after surgery. An assessment of buccal bone changes was performed by matching DICOM files of the CBCTs taken before tooth extraction and at 6M. The evaluation of buccal soft tissue contour changes was performed by matching STL files resulting from digital intra-oral impressions taken before tooth extraction and at 6M. After 6M, there was a horizontal buccal bone loss ranging between 1.35 and 1.98 mm. In contrast, there was an increase of horizontal buccal soft tissue contour ranging between 0.06 and 0.46 mm and the soft tissue thickness, 2 mm below the gingival margin, increased 4 mm.
Conclusions: Within the limits of this case report it can be concluded that the adjunction of a CTG during immediate implant placement may compensate the soft tissue dimensional alteration that usually occur after tooth extraction, maintaining or increasing the buccal volume over time. Moreover, an increase in soft tissue thickness may be beneficial for the biological, functional and esthetical stability of the peri-implant mucosal margin.

Stepwise replacement of missing and ankylotic central maxillary incisors after traumatic dental injury in young adult

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Background: Negative aesthetic sequels of tooth loss or ankylosis after traumatic dental injury in children include vertical tissue defect due to arrest of alveolar growth and alveolar ridge resorption. It is however imperative to postpone dental implant placement by the end of skeletal growth in early adulthood to prevent implant infraposition (Andersson et al., 2012). Additional problem when placing adjacent implants in the esthetic zone is to achieve reconstruction of papillae (Tarnow et al., 2003).
Case report: A 13-year-old girl with a gummy smile and difficult psychological behavior experienced dental trauma after crashing into schoolmate while water sliding. The collision resulted in avulsion of teeth 11, 21, subluxation of 12 and uncomplicated enamel-dentin crown fracture of 11 and 12. There was 3-hours delay in replantation of tooth 11 and tooth 21 was never found. Tooth 11 was treated endodontically with Ca (OH)2 paste and crown fractures restored with a composite. Missing tooth 21 was replaced with provisional removable prosthesis. After 2 years there were obvious signs of tooth 11 ankylosis and extensive horizontal resorption of alveolar ridge in the region of 21. Seven years after trauma, the first implant (Straumann NC/12 mm/SLActive) was placed on position of 21 with simultaneous guided bone regeneration (Buser et al., 2009) using composite bone graft (auto- and xenograft (Bio-Oss) and double collagen membrane (Jason and Bio-Gide). After six months, connective tissue graft was transplanted to the region of 21 for contour augmentation. One year after provisional restoration of tooth 21, ankylosed tooth 11 was drilled out of alveolar ridge leaving the buccal root lamina for socket-shield (Hürzeler et al., 2010). The second dental implant was inserted 6 months after extraction of 11 and three months later, soft tissue management followed ending up with aesthetically acceptable rehabilitation with two fully ceramic crowns.
Conclusions: Stepwise replacement of both missing central incisors with temporary retention of hopeless ankylosed tooth enabled preservation of natural gingival contour including interdental papilla. Nevertheless, soft tissue augmentation with connective tissue graft to further improve buccal contour in slightly underdeveloped region of formerly ankylosed tooth 11 is planned for the future.

Effectiveness of soft tissue augmentation procedure by means of porcine collagen matrix on peri-implant health

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Background: The presence of adequate keratinized

tissue (KT) around implants can influence peri-implant mucosa health. Xenogeneic collagen matrix has been applied for augmenting KT around teeth and implants, demonstrating its efficacy even in comparison to the free connective tissue auto-graft. The aim of this case report is to describe a surgical procedure for augmenting KT around implant and improving peri-implant health.

Case report: A 47 years old female patient with mucositis on implant in position 3.5 was treated with oral hygiene instruction, non-surgical treatment and supportive periodontal therapy. After 6 months plaque and bleeding on probing was still present at the vestibular aspect of the implant, due to difficulties and discomfort in self-performed oral hygiene. The width of KT around the implant was about 1 mm, so a surgical procedure to augment KT width was scheduled. After administration of local anesthesia, a split-thickness flap was elevated in the surgical site in order to prepare the vascular bed for a porcin-derived collagen matrix (CM). The minimal band of remaining KT around the implant was preserved. The coronal edge of the flap was apically moved and sutured with 6/0 absorbable sutures obtaining anchorage to the periosteum. CM was shaped, well adapted and sutured to the vascular bed with 6/0 absorbable sutures. Patient received the standards post-surgical advices and pharmacological therapy. She was checked after 1 week, sutures were removed after 2 weeks and healing was uneventful. Self-performed oral hygiene was started after 1 month and supportive periodontal therapy was administrated every 3 months. Results of the surgical procedure after 6 months show, the absence of plaque and bleeding at the vestibular aspect of the implant, 2mm increase of KT width and reduced discomfort for the patient during oral hygiene procedures.

Conclusions: Long-term survival of osteointegrated implants is largely demonstrated, but success of the implant therapy should consider functional, esthetic, hard- and soft-tissue stability, as well as patient reported outcomes. Plaque accumulation around implants may induce an inflammatory response with ulceration of the epithelial barrier with its apical migration, and random crestal bone resorption. Managing peri-implant mucositis is the key point in the primary prevention of periimplantitis. Some patients might experience pain and discomfort during brushing at implant sites with KT <2 mm, which could impair proper oral hygiene. The present case report demonstrated that augmenting KT width at the buccal sites of the implant may improve daily oral hygiene procedures, reducing plaque accumulation and inflammatory signs.

Autogenous soft tissue grafting and frenectomy for implant site preparation

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Background: Aberrant frenal attachment at the alveolar ridge can lead to shallow vestibule, reduced keratinized gingiva and promote plaque accumulation. Keratinized gingiva helps prevent recession and bleeding around implants. Soft tissue surgery can be done prior to implant placement to prepare ideal soft tissue dimension on the ridge to receive the implant. In this case report, frenectomy was indicated and free gingival graft was done to increase the width of the keratinized gingiva on implant site.

Case report: A 66-year-old healthy Chinese lady extracted #46 due to crack about 4 months ago. On examination, #46 extraction site healed uneventfully with an aberrant frenum attached to midbuccal of the ridge with a narrow zone of keratinized gingiva and shallow vestibule. Cone-beam computed tomography revealed adequate bone height for an implant. After obtaining patient's consent for the surgery and performing local infiltration anesthesia, frenectomy was done to remove the fibrous attachment on the ridge. A partial thickness flap was reflected at the recipient site to receive a free gingival graft. The graft measuring 6mm x 10mm was harvested from the upper left palatal mucosa and secured to the #46 buccal with Vicryl 6/0. Hemostatic sponge (Surgicel®) was placed on the donor site and sutured with Vicryl 5/0. The patient was advised to eat soft diet and refrain from brushing on lower right quadrant. She was prescribed with Etoricoxib (Arcoxia) 120mg once daily to relieve pain and 0.2% chlorhexidine mouth rinse to rinse after meal. The sutures were removed about 2 weeks after surgery. Post-operative review showed increase in width of keratinized gingiva from 1.5mm to 5mm and deepened vestibule on #46 buccal. After 3 months, a wide neck 4.8mm x 10mm Straumann SLA tissue level implant and healing abutment was placed on #46. Implant crown was issued 6 months after implant placement.

Conclusions: Frenectomy and free gingival graft procedure on #46 were performed prior to implant placement, as it is complicated to perform the two procedures simultaneously with the implant placement. Currently, the width of the attached gingiva on the buccal is about 5mm and the probing depth around the implant crown is 2-3mm. The implant is firm and not tender to percussion with no bleeding on probing. In occlusal view, we noticed a thick band of keratinized gingiva with convex gingiva contour around #46 buccal. This thick band of keratinized gingiva provides stability to the periodontium and good access for

cleaning around the implant on #46. In conclusion, periodontal soft tissue surgery such as frenectomy and free gingival graft can be performed to create an ideal soft tissue profile for implant maintenance by increasing the width of keratinized gingiva and deepening the vestibule at the ridge, subsequently providing good access for oral hygiene around the implant.

Free gingival graft to increase keratinized tissue

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Background: The use of soft tissue replacement grafts has become a substantial element in plastic surgery. Soft tissue graft has two different targets: Increase the width of KT and increase soft tissue volume. Free gingival graft around the implants also serves the purpose to improve oral hygiene reducing pain during brushing.
Case report: Patient woman, 60 years old, free gingival graft around the implant. Carved a split thickness trapezoidal flap sutured apically with anchorage to the periosteum, after taking the graft from the palate is stabilized with compression suture at the level of the flap. Healing at 15 days,6 months and 12 months
Conclusions: The "quality" of soft tissue around the implant seems to be able to improve the comfort during brushing, decrease the presence of plaque around the implants, less inflammation and seems less marginal bone loss over time.

Pre prosthetic periodontal plastic surgery of soft tissues: About a case of trauma

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Background: The gingival outline, which conditions dental morphology and contributes to the harmony of teeth and smiles, can be modified for aesthetic and functional purposes, through periodontal plastic surgery. The choice of a surgical technique is based on its simplicity and reproducibility for a given type of lesion. The objective of additive pre-prosthetic surgery is to compensate for tissue deficiencies or deficits that would affect the outcome of the prosthesis.
Case report: This work illustrates the case of a 16-year-old patient with changes in morphology by increased volume and distal displacement of the gum and alveolar mucosa and the position of the median brake on the right side, following trauma accidental fall that resulted in tooth loss (11, 12 and 13). The shape of the toothless crest is the result of the succession of stages of healing after the loss of the dental organ by trauma after one month, the date of consultation of the patient. During questioning, the child, accompanied by his father, informs us about the circumstances of the trauma. This is a direct trauma that occurred as a result of an accidental fall on a rock at the beach, which caused a laceration of the soft tissues on the right side of the upper incisive-canine block. In front of the clinical picture (mucous increase, after which trauma with distal displacement on the right side, following neglected laceration), periodonto- prosthetic rehabilitation requires additive preprosthetic periodontal plastic surgery. After the extraction of the 14, a "Transpositioned Lambeau" (Bahat et al.) was made. The transpositioned flap, a modification of the laterally moved flap, is a partial-thickness flap that prevents bone resorption and the onset of periodontal recession at the donor site. The removable prosthetic solution is considered a temporary approach. Depending on the age of the patient, the choice between a purely prosthetic and implant solution must be made.
Conclusions: The choice of a surgical technique is based on its simplicity and reproducibility for a given type of lesion. Transpositioned Lambeau is a surgical technique that does not require a donor site and vascularization is excellent. There should be no traction on the pedicled flap as it moves. If this is not the case, extend the two vertical incisions and make a periosteal discharge incision at the base of the flap. Treatment outcomes depend on the patient's cooperation and ability to ensure effective oral hygiene. Periodontal health is one of the key factors in the functional and aesthetic success of the prosthesis. The proper healing of the tissues depends in part on the quality of plaque control. The care of this young patient has enabled us to allow the patient to find a smile.

Optimizing peri-implant tissue: A 10 year follow up clinical case

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Background: Peri-implant soft-tissue is of the utmost importance in preserving healthy conditions and aesthetics around implants and prosthetics. In case of thin bio-type / pheno-type and immediate placed implants, there are a risk of dark translucency. It is known that a soft-tissue thickness of more than 2mm is able to mask these translucencies and thereby improve the aesthetics. Increasing the amount of keratinized tissue around implants will improve

healthy conditions.
Case report: This case report demonstrates techniques to improve soft-tissue condition around implants. 10 years follow up are shown. Two implants were placed immediate 1+ (2003) and +2 (2004) after extraction due to trauma. The implants were placed in the extraction sockets and because of the resorption of the buccal boneplate the aesthetics was impaired. The patients was referred for optimizing the soft-tissue aesthetics initially regio +2 and later regio 1+. The need for tissue thickening and covering the dark translucency regio +2 was treated with a coronal advanced split-flap (CAF) supported by a connective tissue graft from the palate (CTG). The increased thickness and keratinization of the tissue made it possible to create papillae next to the pontic at the porcelain to metal fused brigdework regio 1+1,2. After finishing the brigde a recession and dark translucency occurred at the implant 1+. The recession was then treated with a lateral rotated split-flap (LAF) supported by a connective tissue graft (CTG). The healing was uneventful. There was established healthy conditions and improved aesthetics. The patient was followed for 10 years. The result shows that during time there was a increased keratinization and maintained aesthetics. The patient measured outcome was highly positive.
Conclusions: The treatment of soft-tissue recessions around teeth has been an accepted treatment for many years. The treatment of recessions at implants has been considered a treatment with a more uncertain prognosis. This case report support the assumption that if the biological conditions are respected, implants can be treated in the same way as teeth. Well known soft-tissue augmentation procedures were used (CAF and LAF with CTG). Keratinized tissue was repositioned in a more coronal position (+2 CAF) and lateral repositioned (1+ LAF) and supported by transplants from the palate (CTG). The increased thickness of the soft-tissue and the improved keratinization secured a long term aesthetic outcome of the treatment. The patient satisfaction during the treatment and in the 10 years follow up period was excellent.

Coronally advanced flap with a double layered connective tissue graft to treat a peri-implant soft tissue deficiency: A case report

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Background: When delivering an implant supported restoration, the management of the peri-implant soft tissues is of outmost importance to achieve a functional and aesthetic result, that mimics the natural aspect of the tooth and gingiva. When these premises are not met, soft tissue deficiencies can occur. These can be related with: a) recessions of the gingival margin; b) lack of keratinized tissue around the implant abutment; c) lack of mucosal volume, resulting in a flat or concave tissue profile.
Case report: A 47 year old, systemically and periodontally healthy, female patient presented to the Periodontology Master at Complutense University of Madrid, referring some localized discomfort during oral hygiene measures at an implant restoration on tooth 13, and complaining about its aesthetics. The implant was placed 2 years before, presented no signs of mucositis nor relevant bone loss, and was associated with both a mucosal recession and a lack of volume, causing a concave gingival profile. The patient requested an intervention to improve the esthetics and function of the peri-implant soft tissues, but refused to change the implant supported crown. Thus, a trapezoidal CAF+CTG was delivered. Specifically, after the elevation of a split-full-split thickness buccal flap, the emergence profile of the crown was reshaped intra-surgically to reduce its convexity. Then, a de-epithelized free gingival graft was used to create a double layered CTG, which was stabilized in situ with simple interrupted sutures (PGA 8/0). The first, horizontal layer, was used to support the CAF at its coronal position, while the second, vertical one, was used to compensate for the lack of tissue volume and to mimic the root profile emerging from the alveolar mucosa. Finally, the CAF was sutured with a combination of sling (PGA 6/0) and simple interrupted sutures (PGA 6/0 periosteal and 8/0 intramural).
Conclusions: Healing occurred uneventfully and sutures were removed 2 weeks after surgery. At a 3 months follow-up, positive results can be observed, both with respect to the correction of the mucosal recession, and to the achievement of a concave buccal profile of the peri-implant mucosa. Results from this case report, suggest that the adoption of the CAF+CTG, especially if multi-layered, can represent a valuable alternative to address peri-implant soft tissues deficiencies, even at those cases in which the implant supported crown cannot be changed.

Soft tissue management around implant in atrophic site

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Background: Many times, in the atrophic sites, we need to obtain a good soft tissue contouring around implant and under the pontic, in order to improve aesthetic and hygienic results; We can increase the volume of

soft tissues through connective tissue grafts during the second surgical stage.
Case report: We positioned two implants in position 3.5 and 3.7, in order to replace three missing teeth. After three months, during the second surgical stage, we performed a connective withdrawal from tuber and we split in two smaller grafts to position buccally to the implants, suturing them inside a little split thickness envelop flap. After one month, we took an impression and the dental laboratory made a provisional restoration. We noticed that connecting the provisional restoration, its pontic had an exiguous soft tissue thickness and also the patient reported food stagnation. So we decided to perform a second tuber withdrawal with the purpose to thickening the soft tissue under the pontic. It was executed through two vertical parallel incisions to take a graft to suture in a buccal envelop flap; then we repositioned the provisional restoration. After four months we were satisfied of tissue management and we executed a zirconia screw retained bridge.
Conclusions: The amount of keratinised tissue around implant is very important for the maintaining of wholesome tissues, but also the thickness of tissues is fundamental for the prosthetic aesthetic result of restorations. In atrophic ridges, when bone thickness is sufficient to position an implant, the treads and thickness in soft tissues have a great importance in pink aesthetic but also in masticatory function, to avoid food stagnation.

Peri-implant mucosal recession coverage: A novel technique using Zucchelli's modification of coronally advanced flap with enriched bone graft matrix and PRF membrane

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Background: Peri-implant mucosal recession especially in the esthetic zone not only jeopardizes the functionality but it may affect the ultimate success of the treatment which is patient satisfaction. Even though its etiology is comparable to that of marginal tissue recession around teeth, but the prime requisite around implants is the bony dehiscence defect. The aim of this case report is to present a novel technique for peri-implant recession coverage and assess 1 year post-operative outcomes.
Case report: A 45 year old male with history of implant placement 2 years back following a traumatic injury to maxillary left central incisor. Two years after the treatment, patient reported with complaints of implant exposure and appearance of dark shadow along the gingival sulcus, leading to compromised esthetics. Clinical and radiographic evaluation was carried out which included evaluation of soft tissue around implant, radiographic assessment of bone and implant using radiovisography (RVG) and Cone Beam Computed Tomography (CBCT). A recession measuring 2 mm in maxillary left central incisor with very thin periodontal biotype and 1mm of keratinized mucosa was observed. Surgical intervention involved use of Zucchelli's modification of coronally advanced flap with guided bone regeneration (GBR) using enriched bone graft matrix and platelet rich fibrin (PRF) membrane placed over the graft. Flap was sutured after the coronal advancement using non resorbable e-PTFE sutures. Patient was evaluated for the outcomes following 1 month, 06 months and 1 year after the surgery. Post-surgical intervention revealed complete recession coverage along with significant improvement in peri-implant keratinized mucosa and periodontal biotype.
Conclusions: This technique which used a combined approach with GBR, carried out using enriched bone graft matrix with PRF membrane and Zucchelli's modification of CAF resulted in significant improvement in keratinized mucosa and periodontal biotype. Complete recession coverage was observed at 06 months which was stable over a period of 1 year.

Implant malpositioning treatment with customized angled abutment, coronally advanced flap with connective tissue graft, zirconia restorations and laminate veneers in case of lateral incisors agenesis

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Background: The agenesis of lateral upper incisors is one of the most frequent agenesis in the permanent dentition and permanent canines migrate mesially to fill the space. Even if the ideal treatment plan consists of an orthodontic approach to move the canines in their natural position, frequently, implants are placed in the canine position and the natural canines are modified with veneers. In most of the cases, the canine sites have no adequate hard and soft tissue to ensure a correct implant positioning.
Case report: A 35-years old female patient with the agenesis of lateral incisors had previously received two implants in canine position with immediate loading. At the moment of my first visit the patient showed the permanent canines in position 1.2 and 2.2 and two screw-retained resin restoration in position 1.3 and 2.3. The element in position 1.3 showed a inadequate soft tissue height in comparison with the contralateral site due to a too apical and too tilted implant positioning. In order to create a correct gingival margin with a

correct emergency profile a mucogingival surgery was planned. A customized titanium angled abutment for a cemented restoration was created before the surgery. The abutment was initially created in two pieces, the connection and the body, and then was welded after the insertion of an angled screw. This procedure was necessary to obtain a flat vestibular profile in the area that had to receive the connective tissue graft. When the abutment was placed a coronally advanced flap with connective tissue graft was performed on the titanium surface and a resin provisional restoration was cemented. After the maturation of the soft tissue elements natural canines in lateral position were minimally prepared to received two lateral incisors-shaped laminate veneers. The implant in position 1.3 was restored with a cemented zirconia crown and the element in position 2.3 was restored with a screw-retained zirconia crown.
Conclusions: The malpositioning of the implant in position 1.3, that created a mismatch the gingival margins of elements in position 1.3 and 2.3, was managed with a mucogingival surgery and a customized welded abutment. The abutment had specific features such as a flat vestibular convexity, the screwdriver hole shifted on the occlusal face, and a smooth surface. All these features ensured the stability of the soft tissue graft. At 12 months the gingival margin was stable and the implant supported crowns as well as the laminate veneers were well integrated in the patient smile.

Multilayered connective tissue grafting technique: Case description of a novel soft tissue augmentation approach at 16 months follow-up

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Background: Management of failed augmentation cases can be quite challenging to clinicians, because they might result in a more pronounced alveolar ridge defect. Therefore, management of failed augmentation cases requires enhancement of soft tissue quality through mucogingival procedures. In the present case report, we describe the application of a novel multilayered connective tissue grafting to perform a ridge augmentation in a Siebert class III defect after failed vertical guided bone regeneration.
Case report: A 38-year old patient visited the Dental Clinic of the Ospedale Maggiore Policlinico, University of Milan, Italy for a chief complaint of unsatisfactory aesthetics in the upper jaw. Dental history disclosed failed preimplant vertical bone augmentation with GBR procedure in the area of left maxillary central incisor resulting in severe gingival recession of adjacent teeth & compromised soft tissue quantity & quality & severe ridge atrophy (class III). Multilayered connective tissue grafting technique, in a two-step mucogingival surgery, was used to cover the gingival recessions & reach even gingival margin. In the first-step, 2 grafts were utilized: The 1st one was folded to form two layers secured on the occlusal side. The 2nd graft was cut in two parts; The 1st was sutured on the periosteum of the buccal side and the 2nd was sutured occlusally. The flap was then coronally advanced. The second-step surgery was performed 6 months after the first one, due to incomplete coverage. There was no probing around the area of the first surgery. Same flap design applied in the 1st surgery was utilized. After split thickness flap elevation, probing depth around anterior maxillary teeth was 2 mm. Six months after 2nd mucogingival surgery, frenectomy was done to relieve muscle attachment. Fixed bridge was cemented 16 months after the 1st mucogingival surgery. Clinical & radiographic satisfactory outcomes were reached.
Conclusions: Through this case report, we can conclude that: Multilayer connective tissue grafting technique might be successful in correcting soft tissues after failed bone augmentation procedures; Vertical soft tissue augmentation is possible with this technique; Soft tissue management through mucogingival surgery is fundamental in correcting failed GBR cases, especially in the aesthetic zone.

Hard and soft tissue management in immediate implant

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Background: Immediate implant placement is a technique in which the implant is placed at the same time of the dental extraction. Consequently, it will simplify and reduce the time of treatment by combining the time needed for osteointegration and socket's healing. Whereas to ensure the longevity of the results, especially aesthetic results, we must think about hard and soft tissue management to prevent bone resorption and gingival recessions.
Case report: A 41 years old patient with no systemic disease consulted our department for the replacement of the first right maxillary incisor which presents an unaesthetic prosthesis. We decided to carry out an immediate implant placement. After flap elevation,

the tooth showed significant root fracture and bone dehiscence reaching root's apical third. We made an atraumatic extraction followed by implant placement. An xenogeneic bone graft was used to cover the exposed implant threads associated with collagen membrane, and then we added a connective tissue graft to reinforced the periodontal biotype. After 3 months, when the patient came for the second surgical stage a second connective tissue graft was made aiming to ensure the longevity of the aesthetic results by preventing the mid facial recessions after the prosthesis sealing.
Conclusions: The aesthetic stability failure in immediate implant placement is caused generally by gingival recessions especially in cases with thin periodontal biotype in which that risk remains higher than thick one. Therefore, to guarantee a longevity of our aesthetic result, a connective tissue graft should be done in cases with thin periodontal biotype. Furthermore, we have to manage hard tissue using a bone graft to fill the gap between the implant and the vestibular cortical or to overcome a facial bone defect. Finally, a good assessment of periodontal biotype and a good management of hard and soft tissue using proper surgical procedures are the keys for the success of our aesthetic results and the sustainability of our immediate implant.

A novel approach for mucogingival esthetic surgery combined with periodontal ligament grafts: Case series

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Background: Periodontal regeneration with aesthetic results is the favorite subjects of periodontal surgery in periodontal destruction. Periodontal regeneration can only be confirmed by histological studies. We describe regeneration clinically with the difference in clinical attachment level. Pdl grafts have high regenerative capacity. The differentiation of PDL cells to the osteoblast and cementoblasts in vitro culture and the new PDL, cement and alveolar bone formation in these cells are shown in vitro.
Case report: Six patients who has got minimum one isolated recession were enrolled to this study. Bleeding on probing, pocket depth, clinical attachment level, thickness and height of keratinized tissues have been reported at the beginning of treatment. Root planing was done to recession area. Buccal flap was planned like a coronally positioned flap. Vertical releasing incisions were made and flap extents apicoronal for overtreatment because of minimizing the risk for recession. Flap design initiated with partial thickness flap in approximal parts and goes full thickness at submarginal part. Flap design finished with partially thickness flap. Saline was used to irrigation. Pref gel was used as conditioning and removal of smear layer on root surface. At the same time the tooth which has got extraction indication has been extracted gently. Important part of extraction was protecting periodontal ligament on root surface. Periodontal ligaments scraped from root surface with scraper and saved at moist gauze. These periodontal ligament grafts were used on prepared root surface. Natural resorbable collagen membrane used on grafted site and this surgical area was sutured.
Conclusions: Successful results in clinical attachment level, height and thickness of keratinized tissue has achieved together. PES score was increased. Periodontal ligament grafts can used for regeneration and excipient for gingival recessions. This study can evaluate with new researches and new surgical procedures.

Treatment of multiple gingival recession defects associated with carious and non-carious cervical lesions with a combined periodontal-restorative approach: A case report

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Background: About 50% of gingival recession defects (GR) are associated with defects of the exposed root surface, typically with the presence of carious and non-carious cervical lesions (NCCLs). In these cases, when the cemento-enamel junction is not identifiable due to the presence of a cervical lesion, the ideal treatment consists in performing a restorative therapy prior to mucogingival surgery, in order to satisfy patient expectations and increase its long-term success rate.
Case report: A 53-year old female patient presenting multiple RT1 type GR (#22-25) associated with carious and non-carious cervical lesions was treated using a combined periodontal-restorative approach. The worn/decayed dental tissue was reconstructed 1 week prior to surgery using a composite resin. The apical margin of the restoration was placed 1 mm apical to the estimated position of the CEJ. Gingival recessions have been treated using a multiple coronally advanced flap which was elevated with a split-full-split approach in the coronal-apical direction: the surgical papillae were elevated split thickness, the soft tissue apical to the base of the recessions was elevated full thickness to include the periosteum for 3 mm. Apical to bone exposure, the flap elevation continued split thickness

and muscle insertions were eliminated. A connective tissue graft, harvested from the palate, was applied in sites #23-24, presenting low quantities of keratinized tissue and/or a thin gingival phenotype. For the first 2 weeks after surgery patients rinsed with chlorhexidine 3 times a day and suspended brushing the operated area. Sutures were removed after 14 days. At the 6 and 12-month follow-up visits the following parameters were recorded: recession depth, thickness and width of keratinized tissue, probing depth, bleeding on probing and plaque index. Complete root coverage was obtained for all treated sites and there were no significant variations in periodontal parameters compared to baseline.
Conclusions: All treated defects reached complete root coverage at the 1-year follow-up visit, with an increase of keratinized tissue width. Furthermore, the evaluation of periodontal parameters during the follow-up visits showed the absence of gingival inflammation and plaque and the presence of physiological probing pocket depth values. Patient esthetic demands were also satisfied. This case report suggests that performing a partial composite restoration to restore the CEJ before mucogingival surgery, does not interfere with root coverage or negatively influence periodontal conditions at 12-months of follow-up.

Case report: Free gingival graft + laterally moved, coronally advanced flap

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Background: Gingival recession is a frequent issue. Sometimes, gingival recession present unfavorable local conditions for execution of a free gingival graft or a coronally advanced flap. For example if a deep recession is localized at the level of the first mandibular molar, without apical keratinized tissue and with shallow depth of the vestibule. In this area it is possible to use a variant of two-step technique: Free gingival graft + laterally moved, coronally advanced flap.
Case report: A 45 -year-old female, refers a gingival recession on tooth 46. Medical history is unremarkable and general physical examination don't evidence systemic problems. The patient reports that she has pain in her gums when brushing her teeth in the area of the element 46 and she doesn't like the esthetic of this part of her mouth. Treatment plan established a first surgical step where a free gingival graft is positioned apically to the keratinized tissue of the tooth adjacent to the one with the gingival recession (in this case is the element 45). After three months, it is possible to continue with the second surgical step where the grafted tissue is used for the radicular covering of the element with gingival recession through the use of a laterally moved and coronally advanced flap. In the first step the free gingival graft has been sutured to the periosteum bed with 6.0 Vicryl for 14 days with single stiches and with a compressive suture anchored to the apical periosteum to (of??) the graft and suspended around the crown of the tooth. In the second step the laterally moved, coronally advanced flap has been sutured to the periosteal bed with 6.0 Vicryl for 15 days with single stitches along the vertical intersection incision and with a suspended suture anchored to the first molar.
Conclusions: A first clinical evaluation has been made 3 months after the surgery and showed a good root coverage of the first molar. A clinically significant increase of gingival tissue was observed. These favorable results were accomplished with no change in the position of gingival margin or in the height of gingival tissue at the donor tooth/site. The laterally moved, coronally advanced surgical technique was efficacy in treating of this isolated gingival recession. It combined the esthetic and root coverage advantages of the coronally advanced flap with the increase in gingival thickness and keratinized tissue associated with the laterally moved flap.

Root coverage for single deep recession with a laterally moved coronally advanced flap and a de-epithelialized free gingival graft

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Background: A RT2 recession is presented, treated with a laterally moved coronally advanced flap aimed to root coverage, increase of the keratinized tissue and change of the phenotype. A 30-year-old women went to the periodontology clinic of the Complutense University, afraid of losing the lower central incisor. The patient was diagnosed as a stage I grade B periodontitis A RT2 of 7 mm depth was presented at number 41, without keratinized tissue and less than 1 mm of gingival thickness [3].
Case report: After the proper caused-related therapy, a restorative phase was proposed to the patient in order to resolve the mucogingival condition. The technique performed was the laterally moved coronally advanced flap. A split-full-split thickness flap was created distally to the recession in order to elevate the flap. Extending 6 mm more than the width of the recession, from the distal line angle, and connecting apically to the most apical part of the recession. Then, the de-epithelization of the mesial aspect was performed, extending up to 3 mm from the mesial line angle, eliminating at the same

time the frenulum. Root planing was carried out. At this time point, a connective tissue graft was harvested, with a mesio-distal length equal to the total recipient bed. In order to advance the flap and eliminate the muscle insertion, deep and superficial split incisions were performed with the elimination of the submucosal labial tissue. Once a passive advancement of the flap was achieved, de-epithelization of the papillae was performed, and the graft sutured with PGA 6/0 with simple and mattress stitches. The flap was laterally moved and coronally advanced with periosteal sutures in the apical aspect, in order to release tension, and with a sling suture in the most coronal aspect with a Polyglecaprone 6/0 adapting the flap to the new coronal position.
Conclusions: The final flap position was optimal after 1 week. After 2 weeks of healing, the sutures were removed, a little rebound of the flap was observed, leaving the connective tissue graft exposed. After a month and a half, healing was clinically complete with partial root coverage. The patient was completely satisfied with the results, expressing minimal morbidity during healing. A 62% root coverage, an increase of keratinized tissue and a change of the gingival phenotype were achieved.

The use of CTG and dermal matrix in reducing gum recession: A split mouth case with a 1 year follow up

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Background: Laura is 30, in good general health, non smoker. She came to my office asking for a solution to her gum recession due to high sensitivity and unsatisfactory aesthetics. Her periodontal status was healthy as well: no deep inflammation, good plaque control and no pockets were present. I explained to her that the main cause of her recession was the traumatic brushing. Thus, first of all, I instructed her on how to brush properly and planned the surgical correction of the two involved sextants.
Case report: In both sextants, Laura presented recessions type RT1, according to Cairo 2011. I started the surgical procedure from sextant 1 where Laura had a main recession on the tooth 1.4 (4mm in height with a step of 2 mm in depth) and two more recessions on the proximal teeth both of 1 mm in height. According to Zucchelli & de Sanctis, 2000 an envelope flap design with a split-full-split thickness approach was used to treat these recessions. Thus, in order to permit the coronal advancement of the flap, all the muscle insertions present in the thickness of the flap were eliminated and the exposed roots were gently planed. A CTG was harvested from the palatal side with a three-incisions approach (Trap-door technique by Langer & Langer, 1984), placed over the 2mm step present on the buccal aspect of the element 1.4 and sutured around the CEJ with resorbable 6-0 sutures. Finally, the flap was gently moved coronally and sutured 1 to 2 mm over the CEJ according to Pini Prato, 2005. In the 3rd sextant, I've designed a trapezoidal split-full-split flap with two beveled oblique incisions. After flap mobilization and gentle root-planning, I used an acellular tridimensional collagen matrix derived from porcine dermis in order to avoid the donor-site morbidity. The matrix was sutured a little over the CEJ and the flap was moved coronally and once again sutured 1 to 2 mm over the CEJ.
Conclusions: Laura has had two surgical procedures to reduce very similar recessions she had on both sides of her upper jaw, namely at level of teeth 1.3-1.4 and 2.3-2.4. Both procedures ended with complete root coverage and both, as you can see here, are 1 year on from their original surgery. The site treated with CTG has shown faster healing during the first weeks after surgery but Laura had been complaining of pain from the donor site for more than one month after surgery. On the other hand, she really liked not harvesting from palatal site during the surgery at the 3rd sextant. From a clinical point of view, after the first weeks in which CTG seemed to have a better performance, the tissues on both site appeared healed and stable, starting from the third month of healing. At 1 year from surgery, thanks to correct brushing from the patient, the tissues are still stable, healthy and completely covering the roots in both the CTG site and the dermal matrix.

Coronally advanced flap procedure for root coverage. Two case reports with 1 year follow up

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Background: Coronally advanced flap is consider a great technique to obtain a complete root coverage in the treatment o gingival recessions as demonstrated throughout numerous systematic reviews during its history.
Case report: In this study, we present two different cases in aesthetic zone with several gingival recessions. Both cases were treated by coronally advanced flap described by Zucchelli in his article published in Journal of Periodontology in 2000. We have a 1 year follow up of both cases and in this study we evaluate the results.-
Conclusions: Gingival recession with a great amount of keratinized tissue, correct CEJ position or reconstruction by restorative treatment and good quality of adjacent tissues, can provide that coronally advanced flap is a

stable, predictable and safe technique to solve this kind of gingival defects.

Treatment of multiple gingival recessions with the modified tunnel technique preceded by reconstruction of cementoenamel junction

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Background: A growing number of patients visit periodontal practices in order to treat gingival recessions, which coincide with tooth hypersensitivity and aesthetic issues, especially in the anterior region. Clinical occurrences of gingival recessions along with non-carious cervical lesions (NCCL) implicate interdisciplinary restorative-periodontal treatment. Achievement of the expected outcome is dependent on re-establishing the position of cementoenamel junction (CEJ) and adequate surgical method.
Case report: A systematically healthy 59-year-old female patient with multiple recessions, complicated by cervical lesions covered with composite fillings, was referred to a periodontal practice. Her main complaints were poor aesthetic and hypersensitivity of upper front teeth. A comprehensive periodontal examination revealed that the CEJ position on most of the teeth was not detectable due to poorly contoured composite restorations of cervical lesions. First, establishing and reconstruction of the CEJ using composite resin was performed. The position of new fillings was based on the maximum root coverage level (MRC) predetermined by measurement of the ideal papilla height. The subsequent mucogingival surgery using the modified tunnel technique combined with connective tissue graft within teeth 15-23 was performed to cover recessions. Follow-ups at 1 week, 2 weeks, 6 weeks, 6 months, 12 months and 30 months after the surgery have shown a stable clinical condition and satisfactory coverage degree, with an aesthetic effect fully satisfactory to the patient.
Conclusions: Placing composite fillings below CEJ, within root surface, leads, among others, to disharmony in pink-white aesthetics. It is indispensable to avoid iatrogenic complications by careful diagnostics and planning of treatment, focusing on causal treatment and restoration of function and aesthetics. Interdisciplinary restorative and periodontal approach allows to meet these assumptions. The results of treatment lead to the conclusion that the use of modified tunnel technique with microsurgical approach ensures good healing and predictable and optimal aesthetic outcome.

Mucogingival surgery after orthodontic treatment

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Background: Orthodontic treatments can lead to the appearance of gingival recessions, especially in those cases in which we do excessive movements of teeth inclination (Baterhost y cols. 1974, Joos-Vasalli et Al., 2010). Nevertheless, it should be noted that the appearance of recessions has a multifactorial origin, because of that, the hygiene, the presence of fine biotype also affects in the appearance of recessions after orthodontic treatment (Rasperini et al., 2015).
Case report: A 23 years old male patient comes to our dental clinic with multiple recessions in the maxilla and in the jaw after receiving orthodontic treatment. After the periodontal review, photographs and the radiographic series have been done, we notice that the patient has a fine biotype, his oral hygiene is good and there is no bone loss. In the upper jaw, recessions of the teeth 1.3, 2.1, 2.2, 2.3, 2.4 are treated with the Zucchelli technique and a palatine connective tissue graft. All recessions are Miller's type I. In the jaw, the recessions in the teeth 3.3, 3.4, 4.3 are treated with subperiosteal flaps with lateral access and a palatine connective tissue graft. In the third quadrant, we make only a vertical discharge in mesial of the recessions. But in the fourth quadrant, 2 vertical discharge are made to facilitate the detachment without perforating the gum. The recession of 34 is Miller's type I, but recessions in 33 and 43 are classified as Miller type III because the roots are outside the bone crest.
Conclusions: Gingival recessions after orthodontic treatment are frequent, so these patients need subsequent mucogingival surgeries. Miller's class I recessions, both single and multiple, are recessions with a good prognosis because using the correct surgical technique, a complete root covering can be achieved. Miller's class III recessions, as we observe in this clinical case, are not so predictable and therefore we cannot assure the patient that a complete recession cover will be obtained.

Treatment of multiple recession defects in the maxilla and mandible

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Background: This case describes the management of a 31-year-old female patient who was referred for

treatment of generalized gingival recession. Her main concerns were the appearance of receding gums affecting the upper and lower teeth, and increased sensitivity associated with tooth 33. At the time of presentation she was undergoing orthodontic treatment and reported having also had two previous courses of conventional orthodontic treatment. Medically she was generally fit and well and a non-smoker.

Case report: The patient had a high smile line, thin periodontal phenotype, generalized buccal recession and localized areas of inflammation. There was a lack of keratinised tissues associated with the lower anterior teeth. Following further clinical and radiographic examination the main diagnosis was generalized RT2 gingival recession from 15-25 and 36-46. Initial therapy included improving patient's oral hygiene with atraumatic brushing methods, supragingival debridement and management of sensitivity. The goals of corrective therapy were to improve aesthetics and reduce the risk of recession progressing in the future. FGG from 33-44 was provided first to increase the width of keratinized tissues in this area. This would reduce the risk of further recession by improving the quality of the tissues and provide keratinized tissues for coronal advancement in a second stage procedure. CAF with CTG was provided from 16-26 to improve aesthetics in the maxilla. The addition of the connective tissue grafts increased the thickness of the tissues in the most severely affected areas (13-14, 23-24) and improved the predictability of maintaining root coverage. Flap design was based on rotational envelope flaps using 13 and 23 as the centres of rotation. CAF with EMD was provided as a second stage procedure from 36-46 for functional reasons, again using rotational envelope flaps and the 33 and 34 as the centres of rotation. The addition of EMD was to improve the predictability of root coverage.

Conclusions: Reassessment performed at 6 months showed good outcomes overall. Subjectively the patient was happy with the improved appearance, reduced tooth sensitivity and improved comfort when brushing. Objectively, she was able to maintain effective plaque control and partial root coverage had been achieved in line with expected outcomes across all the sites included in treatment. The area which achieved the least improvement in root coverage was the lower incisors. This is likely due to the position of the CEJs in relation to the papilla tips. Despite this, the patient was not concerned as it was not visible and the increased band of keratinized tissue with more even gingival margins in relation to the adjacent teeth would improve her ability to clean effectively and reduce the risk of further recession. This case demonstrates extensive treatment of multiple recessions including soft tissue augmentation and root coverage procedures showing that favourable outcomes can be maintained at 6 months.

Root coverage and papilla reconstruction in RT2 & RT3 gingival recession defects: A novel surgical technique. A case report

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Background: Many authors have proposed surgical techniques aiming to reconstruct the lost papillary gingival complex; no technique thus far has treated the apical shift of the facial free gingival margin and the missing interdental gingival papilla at the same time. This preliminary report describes a new surgical technique, achieving both root coverage in RT2-3 recession type defects and interdental gingival papilla reconstruction by means of an envelope flap plus interdental connective tissue grafts.

Case report: Periodontal plastic surgery of the maxillary anterior sextant for simultaneous root coverage and papilla reconstructions by means of a novel flap design combining the modified multiple CAF and the simplified papilla preservation technique plus interdental sub-epithelial connective tissue grafts: two separate surgeries involved teeth 1.3, 1.2, 1.1, 2.1, 2.2, 2.3.. The first surgery involved the following teeth: 2.1 (RT3 A-), 2.2 (RT3B+), 2.3(RT2B+). The approach proposed by Zucchelli and De Sanctis was utilized. Secondly an intrasulcular incision was conducted interproximally in each interdental space, continuing towards the palate; lastly a bucco-lingual horizontal split-thickness incision was performed at the base of the papillae, providing a connective tissue bed that will later be used for suturing the graft. Then a palatal split-thickness palatal flap, including the preserved interdental papilla, was elevated. On the facial side, the flap was elevated in a split-full-split fashion according to the previously proposed technique. Then a SECTG from maxillary tuberosity, was shaped in order to fit each single interdental area, positioned beneath the anatomical papilla and secured to the palatal flap by means of an internal mattress suture then a single interrupted periosteal suture was placed on the buccal aspect, anchoring the graft to the recipient bed. Finally the anatomical papilla was carefully sutured to its original position and the buccal flap was close.

Conclusions: All the treated sites showed an increasing quality and quantity of the keratinized tissues over time: particularly the creeping of the papillae appeared to continue after the second year post-surgery, although more in depth evaluations are warranted in support. In conclusion to the best of our knowledge, this is the first proposed technique aiming to recreate papilla for the treatment of black triangles while simultaneously providing root coverage for gingival recession defects. A larger number of sites and patients is warranted and clinical measurements are necessary in order to confirm initial observations and clinical impressions.

Modified laterally positioned flap combined with a connective tissue graft as treatment of deep recessions. A case report

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Background: Laterally Positioned Flap (LPF) is one of the conventional approach for resolving single gingival recessions, it was first introduced in 1956 by Grupe & Warren, then followed by many modifications from the design of the flap to the sutures either in combination with or without subepithelial connective tissue graft (SCTG) to improve stability, thickness; clinical outcome and result predictability.
Case report: We report a case of 28years old male who had undergone orthodontic treatment. The patient presented multiple recessions and root exposure in lower jaw which caused hypersensitivity. Clinical examination released Cl III of Miler with 7mm vertical recession on the 41. First we did a complete periodontal treatment for all the teeth and improve the patient's oral hygiene. After the healing period a Modified laterally positioned flap was planned and operated for the root coverage, a SCTG was combined for more stability of the outcome but also it was used to protect the receiver site from further recession. After 10months 95% of root coverage (from 7mm to 2mm) was achieved with acceptable healing and esthetic results in the both donor and receiver sites.
Conclusions: Coronally advanced flap with SCTG is the most commonly used technique as a gold standard treatment for gingival recession but modified laterally positioned flap represent a good option and give acceptable results in advanced and deep recessions.

Versatility of tunneling techniques for soft tissue reconstruction around teeth in different clinical applications

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Background: Although current evidence reports efficacy of some surgical techniques to obtain root coverage, there is still a clinical demand to minimize postoperative complications such as dehiscence, graft necrosis, flap sloughing, and scar tissue formation. Tunneling procedures (TUN) can induce less vascular trauma, improve flap stabilization and postoperative healing. The aim of this report is to highlight application versatility of TUN techniques to a broad range of clinical indications around teeth.
Case report: 4 cases will be presented, regarding root coverage of Miller Class I and II (Cairo RT1) gingival recessions, in the following indications: multiple recessions in the esthetic zone (case #1); deep single recession in the anterior mandible (#2); lack of volume and attached gingiva prior to orthodontic treatment (#3) and combination with fixed prosthodontic rehabilitation (#4). Connective tissue grafts were harvested from the palate either by the single incision technique (#4) or en bloc and deepithelialized (#1-3). TUN was applied with slight technical variations according to case-specificities, either using the modified coronally advanced tunnel (#1 and 3), the microsurgical modified tunneling (#4) or the laterally closed tunnel (#2). The surgical design can incorporate distinct levels of flap elevation, mobilization and partial papilla detachment, and also different possibilities of flap and/or graft stabilization with complementary suture techniques. Cases presented recessions ranging from 2mm to 6mm depth. All cases underwent a favorable initial healing without adverse complications. A complete root coverage was achieved in the majority of teeth with a significant increase of thickness and width of keratinized tissue. For the first 3 cases, the follow-up period was 6 months and 20 months for the last case. Regarding patient's evaluation, all patients were very pleased with functional and esthetic outcomes and would have the same treatment again.
Conclusions: The tunnel technique is a versatile approach that allows the integration of different surgical steps according to case-specific scenarios. Nevertheless, it's a sensitive technique and a time-consuming procedure that demands advance surgical training, the use of specially designed microsurgical instruments and, preferentially, magnification aids. This surgical concept allows free papilla incision flaps, strict control of the gingival margin and optimal immobilization of the complex flap-graft on root surface interface. These are key aspects to respect blood supply and improve wound stability. Despite some positive scientific evidence for root coverage in multiple recessions, clinical experience shows that predictable and esthetic outcomes can be achieve with TUN techniques in a wider range of clinical indications around teeth. These results also encourage its potential use in soft tissue reconstruction around alveolar ridge and peri-implant defects.

Simultaneous treatment of RT2/RT3 gingival recessions and soft tissue augmentation of a

pontic space: A case report with a 6 months follow-up combining the connective tissue platform technique with the CAF + CTG and with the removal of labial submucosal tissue

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Background: Numerous techniques have been described for the treatment of gingival recessions and for the augmentation of the soft tissue volume at edentulous pontic sites. Irrespective of the adopted protocol, the absence of a fully maintained interproximal attachment (RT2/RT3 recessions), the presence of a thin gingival phenotype, and a limited vestibule depth, represent local complexity factors that may reduce the probability of root coverage and limit the achievable gains in soft tissue volume.
Case report: A 59 year old, systemically healthy woman, presented complaining about the aesthetics of her lower incisors. RT2 and RT3 gingival recessions were identified at 32 and 42, and at 31, respectively. Moreover, a Seibert class III volume deficiency was present at the pontic space 41. A periodontal plastic surgery was realized with the aim to increase the soft tissue volume at the pontic site, partially correct the gingival recessions at 32, 41, 42, and convert the local gingival phenotype from thin to thick. A connective tissue platform technique was realized at the site 31, combined with a trapezoidal CAF + CTG at 42, 41, 32. After elevating a full thickness lingual flap with periosteal fenestration, a split-full-split thickness buccal flap was raised and, the labial submucosal tissue of that area was removed. After de-epithelization of the soft tissue platform and anatomic buccal papillae, EDTA 24% and EMD were applied on the root surfaces. Then, two tuberosity CTGs were sutured to the occlusal aspect of the platform and a third CTG from the hard palate was sutured at the buccal aspect of the lower incisors. Finally, primary intention closure was achieved through the coronal advancement of the buccal flap and repositioning of the lingual flap. Closure was achieved with a combination of sling sutures (PGA 6/0) and simple interrupted sutures (PGA 7/0 & 8/0).
Conclusions: The patient healed uneventfully and sutures were removed after 14 days. Preliminary results at a 6 months follow-up, showed that partial root coverage was achieved at 42, 41, and 31, and a gain in soft tissue height and thickness was achieved at the pontic site 31. Moreover, the local tissue phenotype was converted from thin to thick, and a vestibule dept compatible with the execution of routine oral hygiene manoeuvres was maintained. A second provisional prosthetic rehabilitation providing an ovate pontic profile will be shortly delivered, in order to start conditioning the matured soft tissues at 31. Preliminary results from this case report, suggest the combination of a connective tissue platform technique with a CAF + CTG and removal of the labial submucosal tissue, is a valuable alternative for the simultaneous treatment of tissue volume deficiencies at pontic sites, and adjacent RT2 and RT3 gingival recessions.

Two root coverage approaches for the treatment of shallow recessions

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Background: There are a large variety of therapeutic approaches to treat gingival recessions with a different degree of success respectively. Decision regarding which technique is more appropriate for a specific situation may depend on the location of the lesion (maxilla or mandible), number of teeth affected, anatomical considerations, surgeon skills, etc.
Case report: A systemically healthy, non-smoker, 34 years old woman came to the periodontology department of the University Complutense of Madrid after being treated in other departments previously. The chief complaint of the patient was to improve her smile after a recent orthodontic and prosthetic treatment since her gums has receded. Multiple recession type II (Cairo 2011) were present at 1 and 2 quadrants. After a thorough periodontal and radiographic examination, a professional prophylaxis together with oral hygiene instructions was performed. A coronally directed roll technique was prescribed to minimize tooth-brushing trauma to the gingival margin. Re-evaluation was done in 1 month to check whether the plaque control was adequate and to measure precisely the root exposure once that tissues were not edematous anymore. Two different approaches were performed in each quadrant. In the first quadrant a minimally invasive treatment trough a vestibular incision and periosteal tunnel access (VISTA)(Zadeh et al 2011) was performed together with a CTG obtained through a single incision technique (Hurzeler et al 1999). On the other quadrant, a multiple CAF (Zucchelli 2000) together with a CTG taken by means of an epithelized graft that subsequently was de-epithelized was done. Patient was instructed not to brush their teeth in the treated area, but to rinse their mouth with chlorhexidine 2/day for 1 min. Two weeks after the surgical treatment the sutures were removed. 12 months follow up.
Conclusions: The two surgical approaches carried out to the patient were highly effective and predictable in obtaining root coverage of gingival recessions and improvement of the aesthetic. Regarding the former, which was the chief complaint of the patient, complete root coverage (up to the CEJ), perfect blending of the

tissues and no scars were obtained. It is interesting to note that different techniques may achieve the best results in terms of predictability and success so other considerations such as patient perception of the surgery, morbidity and surgeons skills may be taken into account

Connective tissue graft + CAF for complete root coverage: A case report

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Background: The principal goal of modern periodontal plastic surgery is to embrace the ultimate esthetic outcomes. Among several techniques, connective tissue graft-based approaches demonstrate the strongest potential of achieving complete root coverage, with better esthetic results. The graft acts as a biologic filler, improving the adaptation and the stability of the flap to the root. As a result, the gingival biotype becomes thicker and the potential of a complete root coverage is higher (Zucchelli 2019).
Case report: The 25-year-old patient present a thin periodontal biotype with a root exposure (Miller's class I). After examining the surrounding keratinized tissue, it was decided to use a connective tissue graft, placed on the root surface, and covered with a coronally advanced flap (CAF). After the exposed root planing, the design of the flap is drawn. Two horizontal incisions, extending 3 mm from the gingival collar to the adjacent teeth are produced. At the end of each horizontal incision, a vertical incision extended beyond the muco-gingival line, allow the elevation of a dissected flap, in partial thickness, in order to create a periosteal bed for the graft. A connective graft, about 1 mm thick, was taken from the palate. The harvesting approach was the trap-door technique. It mainly achieve a healing by primary intention, by preserving a primary palatal flap that is then sutured to the donor site after harvesting. This approach was initially considered the gold standard as it accompanied less postoperative morbidity. The connective tissue graft was fixed by sutures to the underlying periosteum and to the lateral banks of the site. The flap is moved to the coronary position so as to completely cover the grafted connective tissue. The position must be passive, without tension. The patient does not brush for 10 days. Chlorhexidine mouthwash and gel were applied. The sutures are deposited at 10 days; brushing is gradually repressed with a post-operative brush.
Conclusions: The ultimate result at 2 years shows perfect esthetic integration and complete root coverage. The biotype became thick and the functional and aesthetic appearance of the patient's smile have been restored. Over time, the phenomenon of creeping attachment has occurred. This may explain the trend toward stability of the gingival margin. The outcome Connective tissue graft + CAF for complete root coverage: a case report confirm that CTG under CAF results in increased probability of complete root coverage, specially at sites with thin baseline gingiva (Cairo and al. 2016).

Combination of tunnel approach with other surgical techniques for the treatment of adjacent gingival recession defects

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Background: The tunnel procedures for root coverage have the advantage of accelerated blood supply and uneventful wound healing. However, limited coronal pull is a potential limitation and has considerable influence on coverage of multiple gingival recessions with varying depths and keratinized tissue width. Therefore, it may be beneficial to combine tunnel approach with other surgical techniques to achieve improved surgical outcomes in adjacent recession defects which has not been previously reported.
Case report: Case 1: A 28 year old patient presented RT1 recession in mandibular right canine (deep-wide) and lateral incisor (shallow-narrow). Canine tooth was slightly rotated and had broad interproximal papilla. Considering the varying recession depths and papillary dimensions, a combination of two techniques was planned for coverage of exposed roots . A double papilla flap for canine and tunnel approach for the lateral incisor with connective tissue graft (CTG) was done. Flaps and CTG were stabilized with microsutures (6-0 & 7-0). At 6 months follow up, root coverage was achieved and maintained to maximum root coverage line. Case 2: A 34 year old male complained of receding gums and sensitivity in upper front teeth. Clinical examination revealed shallow RT1 recession defects in maxillary left incisors and cervico-enamel defect with gingival recession in canine. A combined surgical approach comprising of tunnel technique and coronally positioned flap with one distal vertical incision was performed to achieve root coverage. Papilla between teeth 21, 22 and 22,23 were raised as full thickness but not detached. Tunnelled flap was coronally advanced with double crossed suture anchored at splinted incisal contacts. Flap at canine tooth was coronally advanced after de-epithelialization of distal most anatomical papilla and stabilized with sling suture. Vertical incision was closed with interrupted 7-0 sutures. Complete root

coverage was achieved at 7 months follow up period.
Conclusions: It is difficult to achieve same degree of passive coronal positioning of mobilized tissues for mandibular recession sites due to high muscle attachments resulting in strong and constant tension in comparison to maxilla. Therefore, a combination of double papilla flap and tunnel approach in case 1 obviated the need for coronal positioning. Further, the double pedicle ensures revascularization of CTG on canine and exposed part of CTG on lateral incisor resulted in an increased keratinized tissue width. It is technically difficult to achieve root coverage of a deep gingival recession in terminal tooth with a tunnel only approach owing to limited coronal pull. In such cases (case 2), a combination of coronally positioned flap with vertical incision for deep recession in terminal tooth and tunnelling procedure for other teeth results in a passive closure on the exposed roots. Combination of surgical techniques can therefore be recommended for desired outcomes and needs to be investigated.

Coronally advanced flap (CAF) versus bilaminar technique (CAF +CTG) for treatment of multiple gingival recessions: A split-mouth case presentation with a 5 years follow up

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Background: The aim of this split mouth case presentation was to compare the clinical outcomes in terms of complete root coverage (CRC) and buccal soft tissue thickness between the coronally advanced flap (CAF) alone and coronally advanced flap plus connective tissue graft (CAF+CTG) in a 5 years follow up.
Case report: A periodontally healthy 30 years old female patient presented with multiple gingival recessions in the both sides of the upper jaw due to inadequate oral hygiene habits. All recessions fell under Miller 1 class. On the one side, the recessions were treated with coronally advanced envelope flap design (de Sanctis, Zucchelli), whereas on the contralateral side an autogenous connective tissue graft was also used in a bilaminar technique manner. The used connective tissue graft from the palatal donor site resulted from extraoral de-epithelization of a gingival graft (DGG). The patient reported minimal postoperative discomfort, swelling and bleeding at suture removal, two weeks postoperatively. An uneventful clinical healing was presented without any dehiscence and/or necrosis. The first follow up was done 3 months postoperatively, after which the patient failed to show up for follow-up visits until 5 years later. The clinical measurements taken at baseline and at 5 years follow up were recession depth (REC) and probing depth (PD) at mid buccal side. Clinical attachment level was also calculated (PD+REC). In the CAF side, the baseline mean gingival recession was 2.5 mm, while the final mean gingival recession was 0.8 mm. In the CAF+CTG side the baseline gingival recession was 3.0 mm, while the final gingival recession was 0.4 mm. A better coronal improvement of the gingival margin without apical relapse and greater soft tissue thickness was observed in the CAF + CTG side.
Conclusions: The conclusion limited to this split-mouth case presentation is that the clinical outcomes from the compared treatment modalities: CAF + CTG (bilaminar technique) and CAF alone, are better in the bilaminar technique side at 5 years follow up.

A combination of periodontal and restorative treatment of multiple gingival recessions associated with non-carious cervical lesions

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Background: Multidisciplinary approach is a key factor in up-to-date periodontal treatment. One of clinical cases which requires such a therapy is a concomitance of multiple gingival recessions with abrasion in the cervical area resulting in loss of cementoenamel junction (CEJ). Such condition complicates both diagnosis and treatment of recessions, therefore CEJ reconstruction must be performed.
Case report: A generally healthy 27-year-old female patient was referred to a periodontal practice after completion of orthodontic treatment with fixed appliances. Patient's concerns were teeth hypersensitivity and their aesthetics. No periodontal examination or treatment was conducted before. Following a comprehensive periodontal examination, causal therapy and conservative treatment were performed. Among teeth on which CEJ was not clinically detectable as a result of non-carious cervical lesions (NCCL), predetermination of maximum root coverage level (MRC) was conducted. It was based on measuring the ideal papilla height as the vertical distance between the tip of the papilla and the mesial/distal CEJ point angle (CPA). Afterwards surgical treatment was performed, with 3 months' intermission between treating the 1st and 2nd quadrant. Recessions coverage within 3rd and 4th quadrant are yet to be done–the treatment is scheduled for the 1st half of 2020. Surgeries using the multiple bilaminar envelope technique

(coronally advanced flap and connective tissue graft) were performed for both 1st and 2nd quadrants. The grafts were harvested as a de-epithelialized epithelium-connective tissue graft from the area distal to the second premolar to the second molar. Follow-up visits took place 1, 2 and 6 weeks, 6 and 16 months after the surgery. The outcome is clinically stable and the patient's expectations are fulfilled, both functionally (elimination of teeth hypersensitivity) and aesthetically.

Conclusions: Pre-orthodontic periodontal evaluation should be performed to assess and, if possible, decrease the risk of recessions development during treatment. The combined restorative-periodontal treatment in case of gingival recessions in association with NCCL defects is inherent to re-establish proper emergence profile of a tooth with cervical lesions and calculate the MRC to obtain the best possible clinical outcome. The bilaminar envelope technique provided stable conditions with augmentation of keratinized tissue and very satisfactory aesthetic effect.

Therapy of peri-implantitis with implantoplasty. A case report

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Background: Peri-implantitis is the most frequent cause of late implant failure. There are various treatment modalities to treat peri-implantitis, t. When a titanium implant surface has been exposed to the oral cavity and contaminated with bacteria, implantoplasty to completely flatten/smooth the exposed part of the implant using rotary instruments may be indicated. The aim of this case report was to assess the results by implantoplasty of the implant body surfaces in case with peri-implantitis.

Case report: A 63-year-old female, systemically healthy, patient, sought treatment to improve retention and chewing efficiency of his lower complete denture. So that, two implants were placed in the interforaminal region, followed by ovarian denture with ball holder. Two years later, the patient came to our clinic with pain and bleeding in one of the implants. Plaque was observed around the implant. periodontal probing depth and initial bone loss were detected, 7 and 5 mm, respectively. Patient was diagnosed as peri-implantitis. Full thickness mucoperiosteal flap was reflected following cevicular incisions around implant. Then tissue debridement was done with metal currets. Implantoplasty procedure was carried out with diamond grit polishing bur. The aim of implantoplasty is to produce a smooth and polished implant surface, thereby reducing the amount of dental plaque that attaches to it as well as remove the implant threads. Peri-implant bony defect was thoroughly washed with normal saline. The site was sutured with PTFE sutures. The standard post-operative instructions given to patient and recalled after 7 days for suture removal.

Conclusions: After 1 month during re-evalution, BOP was absent and peri-implant probing depths were measured 2 mm mesiobuccal, 2 mm distobuccal and 2 mm on lingual aspect.The present results suggest that success rates of peri-implantitis therapy with surgical implantoplasty are high. Implantoplasty can be effective method in the surgical resective treatment of peri-implantitis.

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