Maxillo-facial surgery

Oral bone tissue reconstruction using both marine or non-marine substitutes: a review

Giulia Amoroso, Luca Fiorillo, Francesca Gorassini, Roberta Mastroieni, Cristina Maria Rosa Scoglio, Stefania Marino, Floriana Lauritano, Roberto Lo Giudice, Gabriele Cervino, Marco Cicciù

Department of Biomedical and Dental Sciences and Morphological and Functional Imaging, University of Messina, Italy

Aim: The aim of the present investigation was to systematically analyze the literature on the reconstruction of facial bone defects using marine collagen or not and to evaluate a predictable treatment for their clinical management.
Methods: This systematic review also aimed to evaluate the potential of reconstructive marine biomaterials used like scaffolds for growth factor in order to provide better results in comparison to others. The review was performed searching MEDLINE and EMBASE databases from 2007 to 2017. Clinical trials and animal in vitro studies that had reported the application of bone substitutes or not for reconstruction of bone defect and using marine collagen or other bone substitute materials were recorded following Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The first selection involved 1201 citations. After screening and evaluation of suitability, 39 articles were added at the revision process. Numerous discrepancies among the papers about bone defects morphology, surgical protocols, and selection of biomaterials were found. All selected manuscripts considered the final clinical success after the facial bone reconstruction applying bone substitutes.
Results: Nowadays, collagen is considered the major constituent of the extracellular matrices of all animal and metazoans. For this reason, collagen derived from marine sponges can be evaluated as available substitute for uses like scaffolds in the bone regenerative procedures for facial large bone defects regeneration in order to have a substantial quantity of material and to avoid a second surgery site. Marine species present a distinct advantage as a lower known risk of transmission to humans of infection-causing agents and are thought to be far less associated with cultural and religious concerns regarding the human use of marine derived products. Marine organisms like coral or sponge are rich in mineralized porous structures and their microstructures seem to replace the human bone features. Recently, Lin et al. developed a novel scaffold, derived from fish scales, as an alternative functional material with sufficient mechanical strength for medical regenerative applications. Fish scales, which are usually considered marine wastes, were acellularized, decalcified and fabricated into collagen scaffolds. Marine collagen seems to favor the dimensional stability of the graft and it could be an excellent carrier for growth factors. Authors concluded that the use of rhBMP-2 without concomitant autogenous bone grafting materials in large critical-sized mandibular defects secondary to a large mandibular tumor produced excellent regeneration of the treated area.
Conclusion: The scientific evidence regarding the advantages of the application of a biomaterial versus autologous bone still remains debated.

Temperature-controlled continuous cold flow device versus traditional icing system for the management of perioperative pain and

standard Poisson regression analysis. For each study, the estimated marginal bone loss (MBL) at five years was calculated by dividing the MBL reported by years of follow-up and multiplying for five.
Results: Thirteen clinical studies were included. The overdenture was the rehabilitation of choice for every included study. Overall, 316 patients received 1133 mini-implants. The identified narrow diameter implants had a diameter inferior to 2.5 mm. Follow-up ranged from one to 7 years. Eleven studies reported the type of surgical protocol, either flapped (5), flapless (5), or both (1). Reported survival rates ranged from 84.7% to 100%.
Conclusion: Clinical data, from this systematic review, suggest that mini-implants (diameter <2.5 mm) represent a valid alternative treatment option to bone augmentation procedures in the rehabilitation of edentulous jaw with limited width. Moreover, the quality and level of evidence are limited and present a high risk of bias, so caution is advised when interpreting these data. Further studies are required to determine predictability and possible applicability for mini-implants also in supported fixed full-arch restorations.

Dental implant rehabilitation in patients affected by cardiovascular disease: a prospective longitudinal study

C. Caravetta, G. Scavella, C. Ruscica, M. Todaro, P. Capparé

Department of Dentistry, IRCCS San Raffaele Hospital, Milan, Italy; Dental School, Vita-Salute San Raffaele University, Milan, Italy

Aim: The aim of the study was to analyze the frequency and the risk of bleeding episodes following dental implant surgery in patients with temporarily non-altered oral anticoagulant therapy. Do not interrupt the anticoagulation therapy is important to minimize morbidity risk for the patient. In addition, there is scientific evidence that embolic complications may occur in case of suspension, change or reduction of the anticoagulant therapy.
Methods: In this study were selected 70 patients with controlled cardiovascular disease, assessed by the cardiac care unit of the San Raffaele Hospital, which gave consent to the surgery. Patients included in the study had to be treated with oral anticoagulant therapy (WARFARIN) and had to present international normalized ratio (INR) between 2.5 and 3.5. Treatment consisted in the extraction of one or more teeth and the replacement of them through an implant-prosthetic rehabilitation. Hemorrhagic events were scheduled for each patient according to a classification that varied from mild, moderate and severe. A total of 252 teeth were extracted and 133 dental implants (CSR, Sweden & Martina) were positioned. Immediate prosthetic loading was applied after the surgery in 50 patients. Patients were placed in a postoperative care program that included professional oral hygiene sessions and home instructions. Implant osseointegration was evaluated by clinical examinations and the bone-implant level was evaluated with digital intraoral X-rays at 6, 12 and 24 months over time.
Results: Moderate intraoperative bleeding occurred in 15 patients. The slight postoperative bleeding detected were 8: three within 12 hours and two within 24 hours of surgery. Hospitalization was not necessary under any circumstances. Local agents such as bone wax and collagen sponge application, sterile gauze compression, and tranexamic acid mouthwash to stop all bleeding complications were used for each patient. The 2-year follow-up showed a 97.92% survival rate with 2 implants lost. The bone implant level was stable over time with an average crestal resorption value of 0.71 ± 0.42 mm at 2 years.
Conclusion: Nowadays there is no evidence in literature about the risk of hemorrhagic events related to dental implants surgery. Based to the results of this study, implant surgery can be performed safely in patients treated with oral anticoagulants if a minimally invasive approach, a specific implant design, anti-hemorrhagic agents and post-operative rigid recommendations are adopted.

Spiderimplant for treatment of atrophic maxilla: a retrospective clinical study after 5 years

Erminia Coccia[1], Marco Mascitti[1], Andrea Santarelli[1], Luca Aquilanti[1], Giorgio Rappelli[1], Maurizio Procaccini[1], Lorenzo Lo Muzio[2], Massimo Zanna[3]

[1]Department of Clinical Specialistic and Dental Sciences, Marche Polytechnic University, Ancona, Italy
[2]Department of Clinical and Experimental Medicine, University of Foggia, Foggia, Italy
[3]"Casa di cura E. Montanari" Private Hospital, Morciano di Romagna, Italy

Aim: Spiderimplant is a new minimally-invasive implant methodology for the treatment of atrophic maxilla without the need of any reconstructive surgical procedures (such as sinus augmentation, bone graft, and guide bone regeneration). This system consists of primary fixtures fixed in the bone with the additional of customized maxillofacial plates and screws or secondary fixtures. The aim of this study is to evaluate the safety of the Spiderimplant technique with regard to implant-related complications, prosthetic-related complications, immediate and long-term complications.
Methods: This is a retrospective case series of 5 patients (3 males and 2 females) with vertical and/or transverse atrophic maxilla. For each patient, medical history,

drugs, and smoking habit were collected. One patient (54 years-old, male) received 1 primary fixture, 1 customized plate (length 18 mm) and 2 secondary fixtures. One patient (71 years-old, female) received 2 primary fixture, 2 customized plates (length 18 mm) and 4 secondary fixtures. One patient (64 years-old, male) received 2 primay fixtures, 2 customized plates (length 24 mm) and 6 secondary fixtures. One patient (60 years-old, female) receives 2 primary fixtures, 2 customized plates (length 42 mm) and 6 secondary fixtures. The last patient (67 years-old, male) receives 2 primary fixture, one 3D-customized plate (12 mm x 12 mm) and 2 secondary fixtures. All primary fixtures have the following characteristics: length 6 mm and diameter 2.9 mm. All secondary fixtures are length 6 mm with a diameter 2.9 except for two secondary fixtures having a length of 11 mm with a diameter 2.7. All patients have been followed from 53 to 62 months (mean 58.8 months). Clinical data have been collected to evaluate immediate and long-term complications of implants or prostheses. Moreover, 3D CT images are used to verify the correct position of implants and to verify the long-term success of the Spiderimplant systems.

Results: The patients were scheduled for follow-up every 3 months. All patients did not have any implant and prosthetic short-term complication and 3 of them did not have any long-term complication. 2 patients had partial exposure of plate; one of these two patients are a heavy smoker. Nevertheless, all patients maintain good aesthetic and functional results. 3D CT images confirm the correct formation of bone both on primary and secondary fixtures.

Conclusion.This new surgical technique seems to be safe and accurate, confirmed by absence of clinical or radiographic changes and the maintenance of good aesthetic and functional results after a 5-year follow-up. Future prospective studies are needed to verify the excellent performances of this new implant system.

A minimally invasive approach using an immediate loaded 4-mm-short implant without extraction of an impacted maxillary canine: 1-year results

Carlotta Del Principe, Lorenzo Breschi, Carlo Barausse, Salvatore Di Simone, Pietro Felice

Department of Biomedical and Neuromotor Sciences, University of Bologna, Bologna, Italy

Aim: To describe a successfully minimally invasive approach to rehabilitate a site with a residual deciduous tooth along with an impacted canine by using a 4-mm-short implant.

Methods: A 46 years-old systemically healthy female patient was referred requiring the rehabilitation of her maxillary left canine. The patient suffered from pain in the area of her deciduous left maxillary canine. Clinical and radiographic baseline data revealed the presence of a fixed bridge between left canine and left second premolar, the impaction of the permanent canine and a resorption of the deciduous canine root. The cone beam computed tomography preoperative scans showed a palatal position of the impacted canine with about 5 mm of residual bone height. All possible treatments were explained to the patient.The orthodontic solution was denied due to long treatment times and to the possibility of an ankylosis. Also the extraction of the canine, the grafting of the area in order to place a standard-length implant were refused. Considering the available bone below the impacted canine, the suggested approach was to extract the residual deciduous canine, to place in the same surgical session a 4-mm-short implant and to immediately load it. The implant insertion torque was about 55 Ncm allowing for an immediate loading procedure. Sutures were removed after 14 days. The patient was examined clinically every month for the first 6 months, when a definitive crown was delivered.

Results: This kind of approach provided a successful rehabilitation with uneventful healing, from an aesthetic and functional points of view with stable results till 1 year after immediate loading.

Conclusion: Within all the limitations of this case report, a 4-mm-short implant associated with an immediate loading protocol may represent an alternative treatment for a fixed rehabilitation in cases of edentulous sites due to upper canine impactions in adult patients. This approach could reduce operative times, possible complications and postsurgical morbidity with respect to conventional rehabilitations, which can include orthodontic procedures or more invasive surgeries. Accurate case selection and good maintenance programs could be key factors for long-term success. However, randomised controlled clinical trials with longer follow-ups are required to assess whether this simplified approach can be predictable and to evaluate the long-term behavior of the impacted canine left untouched below the short implant.

Observational study on the preparation of the implant site with piezosurgery vs drill: comparison between the two methods in terms of post-operative pain, surgical times and operational advantages

Federica Dotto, Michele Maglione, Lorenzo Bevilacqua, Fulvia Costantinides

Department of Medical, Surgical and Health Sciences, University of Trieste, Trieste, Italy

Aim: Piezosurgery has long been applied in implantology