

Maxillofacial Surgery

Onlay mandibular ramus bone grafts in rehabilitation of the atrophic maxillae: a 5 year-follow-up

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Aim: The present study is a 5 year-evaluation of the complication incidence applying a simplified graft surgical procedure for increasing the bone quantity prior to dental implant insertion. Briefly, this technique requires only three osteotomies with the subsequent mobilisation without the employment of any surgical chisel. Particular attention was paid to measure the bone volumes harvested during the procedure, along with the evaluation of the implant survival rate and implant success rate in the grafted sites.

Methods: 20 patients (14 females, 6 males) with severe alveolar cleft atrophy received 24 bone grafts harvested from mandibular ramus (20 vestibular onlay bone grafts, 2 combined vestibular and occlusal onlay bone grafts and 2 inlay bone grafts). Each patient underwent OPT and TC exams before the surgery. During the harvesting procedure, only 3 osteotomies were performed, and the grafts were indirectly fractured without the use of any surgical chisel. After the harvesting, volume and size of each graft were measured. 35 dental implants were inserted 6 months after the first surgery and each patient underwent clinical and radiological examinations in a 5 years follow-up. Finally, a questionnaire about the level of satisfaction obtained with the whole procedure was completed by each patient.

Results: The medium graft volume obtained was 1.29 ml. The medium length of the graft side facing the external oblique ridge measured 26.1 mm, while the

medium height of the vertical posterior side of the graft was 12.3 mm. After 5 years, all the 35 inserted implants met the survival criteria. In six patients, however, complications occurred after the harvesting procedure: 2 wound dehiscence in the grafted sites; 3 cases of dysaesthesia at the buccal nerve and 1 case of hypoaesthesia at the buccal nerve. In the 24 graft procedures no damage at the inferior alveolar nerve was reported. The average pain duration after the harvesting procedure was 7.4 days. 15 patients out of 20 stated that they would agree to repeat this procedure if necessary.

Conclusions: The execution of three osteotomies only, without involving any surgical chisels, offers various advantages: the reduction of operating times, greater comfort for the patient and a significant reduction of the risk to injure the inferior alveolar nerve, withdrawing at the same time equal volume of bone in comparison to the traditional technique. The procedure is not nevertheless exempt from risks: the great anatomical variability of the buccal nerve course still a challenge in the correct design of the flap by the harvesting site. Moreover, according to survival rates reported by literature, this study showed no difference between implants inserted in bone-grafted sites and implants inserted in native bone.

Prosthetic management of patients with maxillofacial defects after oncological resection

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Aim: Maxillofacial defect caused by cancer treatment represents a problem affecting the quality of life of patients. The post-surgical defects are devastating in many ways, leading to these patients retracting

from their family and society and living a life of seclusion and depression so after surgical resection, rehabilitation is needed. It is not always possible to reconstruct the defect with a surgical approach: in these cases, prosthetic rehabilitation becomes the first choice treatment. This retrospective study evaluated the successful of maxillofacial prosthetic rehabilitation after oncological resections, including both intra- and extra-oral prosthetic devices within the San Donato Hospital Group.

Methods: In this study were included 72 patients, who have undergone a intra or extra-oral maxillofacial prosthetic rehabilitation after an oncologic resection, treated by San Donato group hospitals. Tumors on the head and neck were analyzed and the defects of these resections have been divided in two different groups: intra and extra-oral defects. Patients with extra-oral lesions have been treated immediately after the end of the healing process with an epithesis: if possible, the final restoration uses a different anchor, through adhesives or implant supports. While for the intra-oral restorations, the palatal obturator has been realized after an impression in alginate; this solution does not optimally detect the defect, but it's a good starting point for the realization of a temporary prosthesis: when the healing process was complete, more accurate impressions were taken with polysulfide using the palatal obturator as a guide; the final restoration also contained the teeth.

Results: Sixty-nine patients were treated with maxillofacial prosthesis for post-oncological results of head and neck tumors.

Of the 69 treated for neoplastic disease, 43 received an intraoral prosthesis (palatal obturator) and 29 with an extraoral epithesis (18 with nasal prostheses, 8 with orbital implants and 3 with ear implants).

The group included patients with different types of tumors, respectively: - 36% squamous cancer - 20% basal cell carcinoma - 16% adenoid cystic carcinoma - 11% mucoepidermoid carcinoma - 17% others. In total 30 patients were treated with radiotherapy, 4 with radio- and chemotherapy, 10 were not treated with radiation and 28 are not available for the series. The radiation dose was calculated around 12-70 Gy.

Conclusion: Within the limitations of this study, after the use of obturator protheses patients feel more confident and self-assured. Obturator protheses are a good solution in order to improve the life's quality in patients with tumors resections.

Prosthetic rehabilitation after total resection of the nose and premaxilla for adenosquamous carcinoma

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Aim: Maxillofacial defect caused by cancer treatment represents a problem affecting the quality of life of patients. The prosthetic rehabilitation is a surgical alternative in functional-aesthetic facial reconstruction when the conventional reconstructive surgery cannot be applied either because of the psychophysical conditions of the patient or because of an excessive excessive loss of tissue. The aim of this study is to report an our technical approach to the rehabilitation of a complex oronasal defect by means of a implant-supported dental prosthesis combined with a nasal epithesis.

Methods: We present the case of a 82 years-old man, who had a maxillectomy and total rhinectomy defect because of a adeno squamous cell carcinoma of the tip of the nose. After the surgery, the patient presented a maxillary defect associated to the absence of the nasal pyramid. We hereby describe one prosthetic device rehabilitating two iatrogenic defects by means an overdenture supported to four implants with locator attack that extends throughout the oronasal communication: this offering nasal epithesis anchorage. Both dental prosthesis that epithesis are completely removable from the patient. After oncological surgery, temporary epithesis was necessary because the surrounding tissues are still in a healing process and they cannot excessively stressed. Six months later, four intraoral implants were placed in maxilla and they offer good anchorage in rehabilitating wide defects after oncological surgery and a good chance for patients to improve their quality of life.

Results: Since one year the patient has a prosthetic rehabilitation that allows good phonetics, proper nutrition and adequate social relationship. The patient well tolerated the prosthesis, and he was able to do a proper oral and nose hygiene. From an oncological point of view, there was no relapse of the pathology. The patient did not receive radiotherapy and was non-smoker, two factors that are known to influence the success of implant therapy.

Conclusion: The prosthetic rehabilitation offers a good chance to social reintegration because the aesthetic result and facial camouflage are good and then it allows a good retention of the nasal epithesis and an esthetic result which is satisfying for the patient. Despite the accurate professional and home care required by intraoral implants, prosthetic rehabilitation could be considered an effective and suitable method for rehabilitation of extensively resected head and neck cancer patients.

Maxillary bone generation using mesenchymal stem cells

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Aim: The aim of this work was to study the role of mesenchymal stem cells in bone regenerative procedures in oral benign maxillary lesions, and specifically, the time required to promote bone regeneration for dental implant. We compared the bone mineral density using the hounsfield scale before and after regeneration with MSC with autologous bone.

Methods: We performed, in 5 patients who underwent to biopsy of maxillary and mandibular lesion of non malignant dentigerous cyst, bone regeneration using Stem Cells Regent KIT and autolous bone and study bone regeneration calculating volume bone defect and bone density quality before implant rehabilitation. The eligibility criteria were maxillary or mandibular bone defect from osteolytic odontogenic benign tumors, volume defect > 2cm³ (calculated using osirix software), no comorbidity associated, no smokers patients. The 5 patients consisted of 3 women and 1 men with an average age of 49,4 (range 41-59). The resection methods consisted of marginal resection performed by the same maxillofacial equipe. In all patients was obtained from the superior posterior iliac spine bone marrow aspiration of 40 cc. We have used a RegenKit Extracell procedure (RegenLab SA Losanne, Swiss) to concentration of autologous Stem Cells. Preparation of autologous bone marrow harvested from the iliac crest: 1) list-behavior=enumerated prefix-word=mark-type=decimal; 2) 4 sampling points moving with the trocar; 3) filling volume in Regen THT tubes, 5 ml for tube, final volume before centrifugation approximately 20 ml; 4) only centrifugation 3400 rpm x 8 minutes (greater recovery of stem cells); 5) Centrifuge Regen Centrigel H-19 F. Gently resuspend the cells by separating gel, concentrated and put them in a basin for engineering, based on the final volume of autologous stem cells concentrate (about 14/15 ml) will added 5ml of gluconate calcium if the cells will need to be gelled. We perform a TC scan at 6 months were we evaluate: bone generated volume, bone density using HU scale (osirix software).

Results: The procedure was well tolerated, no dehiscence of surgical wound was observed; no infection of surgical site and well controlled pain. The patients underwent a clinical follow up every months that showed progressive improvement of mucosa layer. A CT scan was performed at 6 months with excellent bone generation. We evaluated the volume of new formed bone (average

volume 2,44 cm³) and bone density quality that showed a very high density restoration with an average of 1137 HU for this new trabecular bone.

Conclusion: Satisfactory bone formation has been observed in maxillary defects. The use of mesenchymal stem cells for bone generation is a new and safety technique without rejection of non autologous material for pre-prosthesis implant rehabilitation

The bat flap: reconstruction of a wide full thickness scalp defect following the excision of a malignant tumor**Bellini P., Salgarelli AC., Setti G., Magnoni C., Consolo U.**

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Aim: Scalp reconstruction following oncologic resections is still a great challenge due to the anatomy of this area and the nature of the disease, the extent of resection in order to preserve the surgical margins, the possibility of tumor recurrence and the requirement for adjuvant radiation therapy. Local, regional and free tissue transfers with or without the association of artificial dermis have all been described for the reconstruction of these complex full-thickness defects. We report the case of an old man affected by a squamous cell carcinoma of the scalp, in order to illustrate a new reconstructive technique for full thickness and wide scalp defects: the bat flap.

Case report: A 78 years old male presented a tumor lesion on the scalp, histologically reported as infiltrative squamous cell carcinoma. The patient underwent a wide local excision of the neoplastic tissue, resulting in a large scalp defect. The bat flap was performed to cover the wound defect. It is a local advancement flap: the anterior parietal part of the scalp was shifted backwards, with the result of two "ears" of redundant tissue which give the name to the flap. An artificial dermis (Integra) grafting was placed on the anterior scalp defect resulted after the flap. Three weeks later the outer layer of silicone was removed and a split-thickness skin graft from the upper leg was performed.

Discussion: The reconstructive techniques for large and full thickness skull defects are: local flaps, bone grafts, free tissue transfers and artificial dermis combined with a split thickness skin graft. These options are not always suitable because of the pre-existing morbidities of the patient, a previous radiation therapy, a distorted anatomy secondary a prior surgery or an ongoing bacterial infection. The techniques for the reconstruction of scalp defects are: healing for secondary intention, skin grafting, tissue expansion, local and regional flaps. However for the closure of large scalp surgical

wounds, free tissue transfer is the most common choice. Free flaps are durable, versatile and available from a variety of anatomical sites. However, this kind of surgery is complex, time consuming and patients require care in a specialist unit post-operatively. We propose a mixed technique that involves the use of the flap and the matrix in the first operative time and the empowerment of the flap and skin graft in the second operative time. This technique requires a two stages surgical procedure. The bat flap with the matrix positioning is an alternative to the free flaps for the reconstruction of large scalp defects following oncologic surgery. The matrix may be applied on the bone with or without periosteum avoiding to let discovered and creating a stable fabric for the next sequence coverage with skin graft. We believe that this technique is oncologically safe and easily feasible. Our preliminary experience with this flap showed no remarkable complications post-operatively and optimal esthetical results. However further evaluations and comparative studies are required to confirm this encouraging initial result.

Perineural spread of oral cancer: the role of preoperative biopsy in survival stratification

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Aim: Perineural invasion (PNI) and neural spread along major cranial nerves hinder the ability to establish surgical control of oral squamous cell carcinoma (OSCC). To date, neural spread can be assessed only after surgical excision evaluating specimen and not in preoperative biopsy material, rendering timely therapeutic planning impossible. The aim of the present study was to assess the preoperatively propension to neural spread by oral cancer using immunohistochemistry and quantitative reverse transcription polymerase chain reaction.

Methods: We examined a series of 60 consecutive

patients surgically treated for OSCC between 2009 and 2014 at the Maxillofacial Surgery Unit, University of Bologna. We evaluated insulin-like growth factor-II mRNA binding protein-3 (IMP3) and laminin-5 expression in preoperative biopsy material using immunohistochemistry and quantitative reverse transcription polymerase chain reaction. We sought to correlate expression of IMP3 and laminin-5 with PNI evident in surgical specimens. All clinical, pathological and demographic data were recorded and correlated with biomarkers expression.

Results: 84% of the cases classified as IMP3-positive on preoperative biopsy showed evidence of PNI in the postoperative surgical specimens, whereas PNI was detected in 12% IMP3-negative cases. The positive predictive value of IMP3 expression was 87.5% and the negative predictive value was 84.4%. Laminin-5 positivity was evident in 67.2% preoperative incisional biopsy samples. PNI was apparent in the surgical specimens of 76.7% cases. The positive and the negative predictive values of laminin-5 expression were 76.8% and 100%, respectively. Expression of IMP3 and laminin-5 in preoperative biopsy material appeared to be predictive of PNI in patients with OSCC ($P < 0.001$). Additionally, the results of multivariate analyses showed that IMP3 status was an independent predictor of death of patients with OSCC. The levels of mRNAs encoding IMP3 and laminin-5 were determined in all enrolled patients. The average number of IMP3 and Laminin-5 mRNA transcripts detected in all cases classified as PNI-negative were significantly different with respect to mRNA transcripts identified for PNI-positive patients ($P = 0.04$, Student t-test).

Conclusion: The present study demonstrates that IMP3 and laminin-5 expression in preoperative biopsy material correlate well with PNI status and may allow accurate preoperative risk stratification of patients with OSCC. In addition, our results suggest that IMP3 is a valid biomarker predictive of poor oncological outcome in terms of loco-regional failure in oral cancer patients. Moreover, according to the present study, the predictive value of IMP3 can be evaluated using preoperative incisional biopsies. The identification of IMP3 expression as a prognostic parameter distinguishing aggressive from more indolent OSCC cases may have important clinical implications, in relation to neck management, adjuvant therapy and follow-up strategies.