

ORAL REHABILITATION ON SMALL SUBSTANCE LOSS CASES

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Abstract: The purpose of this study consists of the identification of implantologic and prosthetic methods and techniques used in substance loss rehabilitation, associated with identifying the specific biomaterials in perfect accordance with each case particularities, without leaving aside the bone-tissue deficiency etiology. A representative number of clinical cases were selected, cases which are relevant for the chosen theme. The possibility of reconstructing the natural parameters of the edentulous alveolar ridge areas is various, starting with augmentation materials of the autogenous and heterograft type biomaterials (Bio-Oss, Grafton, Cerasorb si MBCP) including the mixing of these two types of biomaterials, and going to epitheses, which are the best choice for complex substance loss.

Key words: augmentation materials, biocompatibility, facial prosthesis, implanto-prosthetic therapy.

INTRODUCTION

The implantologic and prosthetic territory represents a domain of excellence in operations of complex oral-maxillar-facial rehabilitation, and it is materialised during a specific and very important stage included in this complex algorithm (1).

The causes of substance loss are represented by oral-maxillar-facial trauma, by cyst and tumour removal, etiologies which confer a high degree of difficulty to these cases (2).

The rehabilitation of the substance losses has an ascendant way starting from intra-orally limited defects up to aspects having a crescendo character with the perturbation of the functions of the stomatognathic system without eluding two well delimited forms, namely the mutilating resorption and atrophy processes triggering serious facial modifications and the absence

of a significant bony capital caused by the tumor ablation.

PURPOSE

The purpose of this study consists of the identification of implantologic and prosthetic methods and techniques used in substance loss rehabilitation, associated with identifying the specific biomaterials in perfect accordance with each case particularities, without leaving aside the bone-tissue deficiency etiology.

The scientific activity unfolded abides by the objectives provided in the initial plan aiming at finishing the mathematical modeling in full compliance with the real clinical situations of a group of patients diagnosed with substance losses, of different sizes anchored in the intra or oral territory, their solving and the biomaterials involved being different.

MATERIAL AND METHODS

For the three - dimensional reconstruction of different types of intra and extra-oral maxillofacial substance losses we used the universal programme Amira for 3D reconstructions for any type of Computer Tomograph.

A representative number of clinical cases were selected, cases which are relevant for the chosen theme. The reconstruction of substance loss is of critical importance in re-establishing the optimal parameters which characterise the edentulous alveolar ridge areas.

The possibility of reconstructing the natural parameters of the edentulous alveolar ridge areas is various, starting with augmentation materials of the autogenous and heterograft type biomaterials, including the mixing of these two types of biomaterials, and going to epitheses, which are the best choice for complex substance loss.

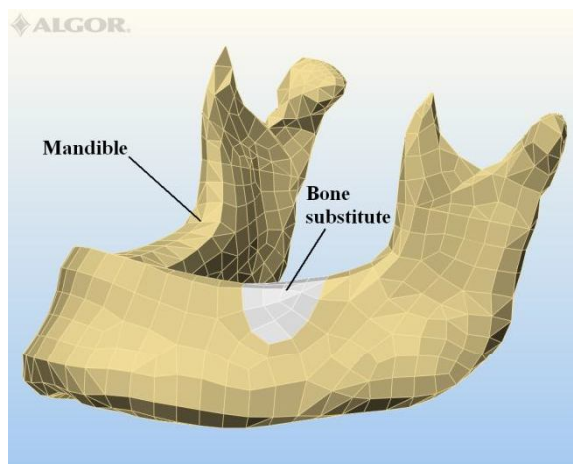


Fig. 1.

When it comes to the biomechanical and aesthetic reconstruction of the arcade, in the majority of the cases the implantologic variant was preferred, followed by the fixed

RESULTS

The dispersion of forces at the level of the mucous-bony support is fully linked to the masticatory force generated by the natural dentition, by diverse types of fixed restorations as well as by the mobile prostheses inducing low tensions at the level of the anatognostic arch, the presence of the silicon material proposed by us as lining material for these types of prostheses after the finishing of the adhesion mechanism between the two biomaterials being in full compliance with the biomechanical principle of reducing pressures at the mucous-bony level. A high frequency of the analyzed cases is represented by substance losses at the mandibular level, the analysis by finite element revealing tension concentrators at the level of the edges of substance defect (Fig. 1).

Aspects of mathematical modeling for a substance loss at mandibular level highlighting the influence of action of the muscular factor over the future reconstruction (Fig. 2).

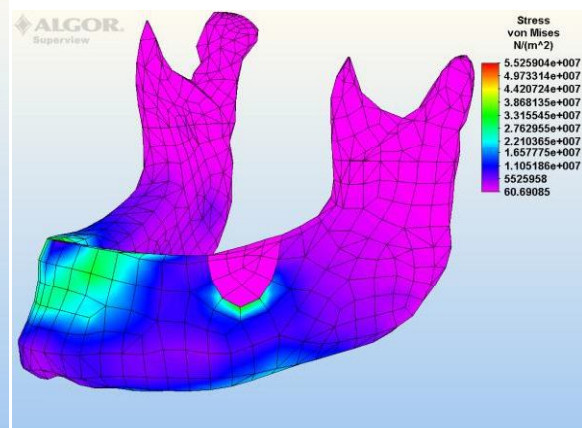


Fig. 2.

or removable prosthesis, which were realised either on a separate, post-augmentation stage, or in the same time with the augmentation stage (2).

The most frequent losses of substance are the intraoral ones, their immediate solution being shown in these two clinical cases - the loss of substance is a

consequence of the oral maxillofacial surgery intervention, the excision of pseudo tumor formations (Fig. 3).



Fig. 3. Aspects of intraoral losses of substance

In the both cases, we elaborated epitheses which aim the restoring of the alveolar and dental arch continuity, equally assuring aesthetic and functional rehabilitation by covering the loss of substance.

An important aspect of epithesis elaboration is the fidelity of the previous morphology restoring, which shows incongruence in both cases.

These fixed prosthetic constructions are the results of a rigorous technological

algorithm, the metallic frame will need special retentions in order to apply the aesthetic compound; the acrylic material can be flexible, protecting the muco-osseous support from traumatism of the aliments passing (Fig. 4).

The final retention of the epithesis is achieved by including the marginal teeth, assuring the restoring of the anterior dental arch, thus leading to the augmentation of the prosthetic construction stability (Fig. 5).



Fig. 4. The epithesis framework



Fig. 5. Final aspect of the epithesis

The morpho-functional and bio-mechanical characteristics of the clinical situation which ultimately resulted, after the

quantification of the clinical and para-clinical data, pleaded for the election of 11 Perio implants, type X class, represented

another cases, very important for this subject. The distribution of the implantations in the two dials was divided in 5 implants with a diameter of 3,3 and 4 mm, with lengths of 10, 11,5, 13 and 15 mm, with the full consensus of the dimensions of the bone support and of the

organic structures substituted in the dial 1:14, 15, 16, 17, 18. At the second dial's level 6 implantations were applied, having the diameter of 3,3 and lengths of 10, 13, 15 mm, corresponding to the dental elements 22, 23, 24, 25, 26, 27 (Fig. 6).



Fig. 6. The radiological aspects before and after implantation

The optimal results were obtained through the rigorous compliance with the bio-mechanical principals and the correlation of the increasing method in the same session with surgical insertion of the implantations, based on the usage of the

Cerasorb bio-material, having a granulation of 150-500 μm , with an inorganic, that reunites the derivatives of the calcium and phosphate, with a high degree of bio-compatibility (Fig. 7).



Fig. 7. Aspects of augmentation with Cerasorb

The confirmation from the images of the clinical and para-clinical jaws offer the radiography of a deficient jaw prosthetic field, the remaining odonotho-parodontal elements being characterized by negative clinical and biological parameters. The degree of the bone absorption, which stood at the basis of the pro-prosthetic preparation

stage, will offer the optimal for the prosthetic bed's design (3).

An important aspect in the case's success was represented by the increase of the ridge in the frontal zone, with the help of the Bio-Oss and of the Titan-made membrane. The manual labour was done at the same time with the implant, the

intervention pleading for the advantage of the limitation for the surgical timing.

The balance between success and failure had relatively limited lines, but for the present case the age and the reaction of the tissue were in favour of the post-operation evolution.

The Bio-Oss is substitute of the natural bone, osteo-inductiv that leads to the controlled bone increase at the level of the



Fig. 8. Aspects of augmentation with Bio-Oss

prosthetic fields characterised by a parodontic affection or by substance losses at the bone level (Fig. 8). This therapeutic selection was based on the inducement of the bone crest at the situs' level, where it was transplanted (4). This decision was correlated with the application of the metal membrane, which is going to adapt at the future volume of the crest (Fig. 9).



Fig. 9. Aspects of Titan mesh in rehabilitation of frontal ridge

The immediate prosthetic was an important stage after the implant and increase, the final prosthetic offering the facial harmony and the confidence of the patient itself (5).

CONCLUSIONS

1. The intraoral losses of substances is a sever mutilation and its elective immediate treatment indication is the elaboration of epitheses.

2. The importance of the substance loss rehabilitation – a stage which is precedent or concomitent to that of implantologic therapy – is reflected in the appreciation of

the resorption and atrophy process on the edentulous crest level and this appreciation has a definitory influence upon accomplishing the final stage of the clinical case.

3. The mathematical modeling of the real clinical situations offers optimal data to choose the treatment solution fully compliant with the parameters characterizing the substance loss, the type of biomaterial involved in the structure of the prosthetic substitute, and in the case of maxillofacial prostheses an important role is played by the fixing means.

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