POSSIBILITIES OF PROSTHETIC IMPLANT REHABILITATION USING VARIOUS BONE GRAFTING MATERIALS

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Abstract

In clinical situations where the insufficient bone offers a contraindication for insertion of dental implants, bone augmentation can provide the necessary structural or functional support.

This study aims to individualise the possibilities of implant-prosthetic rehabilitation for different clinical situations, identifying the system chosen accordingly to the grafting prosthetic version.

The study group included 65 patients in the private practice of dentistry in Baia Mare, and those within the discipline of Prosthodontics and Oral Implantology of the Base for Clinical Education of the Faculty of Dental Medicine Iași, who were diagnosed with different types of edentation and who will benefit from reconstructive techniques based on different grafting systems.

However, despite the many changes made in the design and manufacture of metal abutments, they still exhibit the disadvantage of metal components that appear, when they are used. The grey line what occurs in the soft tissue impart an unnatural look.

For the clinical situations proposed for the implant-prosthetic rehabilitation characterized by insufficient bone volume for the implant placement one can make a series of interventions for bone ridge augmentation receivers, depending on the case during surgery for insert implants or separately.

Key words: implants, bone augmentation, grafting systems, prosthetic rehabilitation;
Introduction

The most important local factor is the amount and quality of bone remaining. Where the bone volume is insufficient for the implant placement, one can make a series of interventions to increase bone crest receiver, depending on the case during surgery for insert implants or separately[1,2].

The addition of autogenous bone is made with bone (patient’s own bone) or artificial bone; the doctor will choose the type of bone implant required by the augmentation and if necessary he will use a biological membrane covering the bone transplantation[3,4].

In clinical situations where the insufficient bone offers a contraindication for insertion of dental implants, bone augmentation can provide the necessary structural or functional support.

In implantology, edentulous posterior maxillary region is a clinical situation more difficult than in any other region of the jaw. Edentulous frequently causes a gradual reduction in the volume of alveolar process.

Aim

This study aims to individualise the possibilities of implant-prosthetic rehabilitation for different clinical situations, identifying the system chosen accordingly to the grafting prosthetic version.

Material and method

The study group included 65 patients in the private practice of dentistry in Baia Mare, and those within the discipline of Prosthodontics and Oral Implantology of the Base for Clinical Education of the Faculty of
Dental Medicine Iaşi, who were diagnosed with different types of edentation and who will benefit from reconstructive techniques based on different grafting systems.

There will be included in the study patients who met the scientific criteria of the predetermined methodology required to achieve compliance with the purpose and specific objectives of the proposed research.

Prior to enrollment, each subject undergoes an evaluation to determine whether it meets the criteria for inclusion, and to exclude patients with systemic or local contraindications.

The assessment will include a clinical examination, highlighting specific medical history and clinical-biological indices determine specific reconstructive implant therapy, using different grafting systems.

All subjects studied had clinical and radiological signs of atrophy and resorption of the edentulous ridge, which would be evaluated clinically and paraclinically in order to apply specific reconstructive techniques that use different grafting system.

**Results and discussions**

This study develops from the data selected and further analyzed of clinical and laboratory evaluations, therapeutic variants analyzed from the batch, there have been studied aspects that interfere with implant-prosthetic rehabilitation and the possibilities for different clinical situations.

Currently, the implant procedures increasingly take into account not only the functionality, but the aesthetics, too. In 40% of cases with implants, clinicians include regenerative techniques to restore the bone and soft tissue. The use of bone substitutes and membranes is today one of the standard therapeutic approaches (Fig. 1).

Larger defects, accompanied by a total alveolar atrophy of the alveolar ridge required augmentation with autologous bone, the needed amount of bone influencing the choice of the donor site (chin, jaw retro- region, or a transplant from the iliac crest).
All aspects of anatomical and physiological jawbone normally unaffected by the pathological processes (mainly edentulous) are important and also the ability to solve effects of the edentulous through various methods of treatment (implants endosseous inserted in various clinical situations, modern methods of bone augmentation).

We have no issues omitted on the soft tissue (epithelial-connective) related to the integration of endosseous implants and tissue augmentation.

A large area of interest in oral implantology is occupied by the use of ceramic materials for the manufacturing of abutments and dental implants. Current ceramic materials are represented by alumina and zirconia.

Dental implants are considered essential treatment options. Published data have shown high success rates for implants placed in the edentulous arches to replace a single missing tooth, but also for the lack of several teeth. With all this, the use of implants to replace missing tooth in the esthetic zone is quite challenging. The restaurations are subjective, especially when the patient has gum smile or a smile with a high line, leading to a direct visualization of the comparison of the restoration and the adjacent natural teeth (Fig.2, Fig.3).
Perfect positioning and dimensional superstructures are essential for well-designed to mime the appearance of natural teeth and to achieve optimal aesthetic dental abutments.

Usually, the implants and the abutments are made by pure commercially titanium, primarily because it is a material with mechanical properties with a well-documented Bio-compatibility.
However, despite the many changes made in the design and manufacture of metal abutments, they still exhibit the disadvantage of metal components that appear, when they are used. The grey line what occurs in the soft tissue impart an unnatural look. The grey coloration would be attributed to a thin gingival biotype, which is unable to block the reflection of light on the surface of the metal stump (Fig. 4). It was suggested the change of the gingival biotype change when using metal abutments to increase the thickness of the gum; this type of thicker gum would block the light that reflects off the surface of the stump improving the aesthetic result. However, the biotype change requires additional surgical procedures, which are not approved by the patients. In recent years there has been an increasing trend of improvement aesthetics with new implant material showing good results. To achieve optimal muco-gingival aesthetic there were developed the ceramic abutments.

Fig. 4 The final aspect of restoration

Today, most companies that realize the implants offer ceramic abutments. The abutments are available in pre-prepared forms or can be adaptable and can be prepared by using manufacturing technics or computer aided manufacture. The preferred materials are ceramics sintered with high purity alumina (Al2O3) or ceramic containing tetragonal zirconia polycrystals stabilized by Yttrium (Y2O3). These ceramics with high resistance show improved mechanical properties. Alumina ceramic has a torsional force of 400 m² / m² to 6.5 MPa fracture resistant / m² and a modulus of elasticity of 210 GPa value. Compared with the ceramic alumina,
zirconium applied improves the resistance that could be explained by micro structural differences such as high density, and particle size reduction of the polymorphic mechanism against propagation. The main reason for the higher strength of the zirconium is given by the stabilizing effect of yttrium, which allows the processing of metastable tetragonal crystal structure of zirconium at the room temperature. The tetragonal phase at the room temperature allows the transformation of the monocyclic phase under stress and is a mechanism to prevent propagation[10].

**Conclusion**

1. In the choice of grafting the quality and the amount of remaining bone are essential.

2. For the clinical situations proposed for the implant-prosthetic rehabilitation characterized by insufficient bone volume for the implant placement one can make a series of interventions for bone ridge augmentation receivers, depending on the case during surgery for insert implants or separately.

3. The possibilities for implant-prosthetic rehabilitation are different depending on the patient's general condition, the status of local regional area.
References


