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INTEGRATED SURGICAL AND PROSTHODONTIC APPROACH IN OSSEOINTEGRATION

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INTRODUCTION

Osseointegration as described by Branemark, has been established as a very well experimentally documented and clinically successful approach for prosthetic reconstruction in both fully and partially edentulous patients. In most cases a long term favourable biologic response can be observed in the interphase between vital bone and pure titanium fixtures. However, the final result occasionally can be compromised functionally or esthetically due to fixture malpositioning. This may be caused by the fact that during surgery the existing bone dictates a placement position that does not favour the prosthetic treatment, indicating that there is a strong need for an intimate cooperation between the surgeon and the prosthodontist. Moreover, occasionally the treatment procedures involve other specialists such as the periodontist or the orthodontist and in some cases the general dentist as well.

The aim of this paper is to describe a well coordinated approach and underline the conducting role of the prosthodontist in all different fases of the treatment with osseointegration.

DIAGNOSIS - TREATMENT PLAN

Before discussing the case with the surgeon a potential patient for osseointegration has to be prepared both dentaly and pshycologically. Periodontal therapy and plaque control should proceed any prosthetic treatment. The esthetic and functional needs of the patient during the transition period will have to be met. Therefore, a preliminary treatment plan should be layed out. The incisal evaluation for osseointegration is done by consulting with the surgeon. It mainly involves a panoramic x-ray evaluation along with study casts that eventually have been modified by diagnostic waxing if required. Based on this evaluation the transitional prosthesis (fixed or removable) is fabricated. Thus the correct position of the teeth is determined and verified.

RADIOGRAPHIC EVALUATION

An acrylic duplicate the transitional prosthesis is used as a radiographic stand. The stand bears metal stiluses that represent the potential position and direction of the implants.

The radiographic evaluation of the supporting bone is then related to the stiluses. Panoramic x-ray, lateral cefalogram, simple and computerised tomography is used according to the specific needs of the patient. CT scans may involve direct coronal tomograms of axial tomograms that are going to be used either for simple or three-dimentional image reconstructions. The choice of the radiographic method is made during the initial consultation with the surgeon.

IMPLANT SURGERY

The radiographic stand is then modified and it is used as a surgical guide stand during implant insertion. In case that the radiographic evaluation has indicated certain modifications on the initial plan, these should be incorporated on the surgical stand. Nevertheless, in many occasions the exposure of the supporting bone after raising the flap, might reveal a situation that obliges the surgeon to act independantly. In that case the presence of the prosthodontist in the operating room is important in order to offer his input in deciding the necessary changes.

ABUTMENT CONNECTION

Many types of abutments are available, that aim to facilitate the insertion of the superstructure and enhance esthetics (standard cylindrical, angulated, conical, etc). The prosthodontist must evaluate different parameters and suggest the type of the abutment to be used before implant exposure, if possible. The height is also important in order to accommodate the superstructure in the existing maxillomandibular vertical height that is available and minimise the visible metal surface in the base of the prosthesis. During surgery it is rather difficult to evaluate the final thickness of the soft tissues and choose the right height of abutments. For this reason, the surgeon can use healing abutments initially. Ater healing is accomplished and the height of the soft tissues is stabilized, the prosthodontist can replace them.

BONE GRAFTING

Certain patients in order to receive implant therapy require ridge augmentation with bone grafting. The authors prefere the use of iliac crest cancelous bone graft because it is rich in osteoblasts and it is easily shaped to the required form. Diagnostic waxing will determine the three dimensional position and form of the ridge to be augmented. An acrylic tray is then fabricated and is used during surgery. The cancelous bone is mushed, the tray is loaded and stabilised on the occlusal surfaces of the remaining teeth. After removal of the tray the shape of the graft is maintained by the flap that is sutured to the periosteum of the residual ridge.

CONCLUSION

Osseointegration as a method of rehabilitation calls for a well integrated surgical and prosthodontic control. The prosthodontist should respond to the responsibility in planning ahead the final result and give the surgeon adequate information for favorable fixture placement. The surgeon on the other hand, should become more and more aware of the prosthodontic dimensions and take them into account during the surgical procedures.

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