

Personal method for predetermination the implants abutment angulation, before the surgical stage

Augustin. T. Mihai¹, Bogdan Vladila¹, Corneliu Amariei², Dragos Totolici²

¹ Implantology department, Faculty of Dental Medicine, "Carol Davila" University of Medicine and Pharmacy, Bucharest Romania

² Oral Health Department, Faculty of Dental Medicine and Pharmacy, "Ovidius" University Constanta, Romania

Summary

Our method consists in the determination before the surgical stage of the implants angulation's in which the implant will be positioned.

The article describes the clinical-technical stages for to make the implant by using the CT Scan and the models of the radiology guidance.

Having in view the small number of solved cases is necessary to continue the research and the evaluation of results on a bigger number of patients.

Keywords: implantology, CT Scan, implant abutment angulation.

The implantology Bucharest School stages the implant/prosthetic treatment depending upon both the economical and social possibilities of the Romanian patients and the long-term results of the different method presented by some authors.

Thus, the first stage is represented by the general medical examination achieved by the help of the anesthetist which will realize the patient sedation during surgery. After that, oral hygiene is achieved using the method of bone structure preservation.

The next stage is the oral perimplantary rehabilitation in which the prosthetic device in the self-balanced centric relation, position which is neuromuscular, determined by the patient. The concepts stated by the Prof Sami Sandhaus are used, who has realized the N.O.R system which is differentiated by the others systems in the world by the high level of the physiologic approaching. So, at the articulator level, the mandible is the

mobile element, not the maxilla as in the other systems.

The reference plan is chosen after the anthropological analyses, which have demonstrated that the plan given by the lowest points of the maxillary tuberosities and the correspondent point of the retroincisal papilla is always parallel with the ground.

In the N.O.R. conception the periimplantary classical prosthetic device must be kept in place several months to check the neuromuscular response. (Figure 1,2)

The positive response demonstrates the use of a correct vertical dimension and occlusal scheme.

Also during the period of self-balance periimplantary rehabilitation it is possible to check the patient's capacity to keep the oral hygiene, which is a very important factor for the treatment prognosis.

The self-balance centric relation is recorded with a hard silicon key, which will

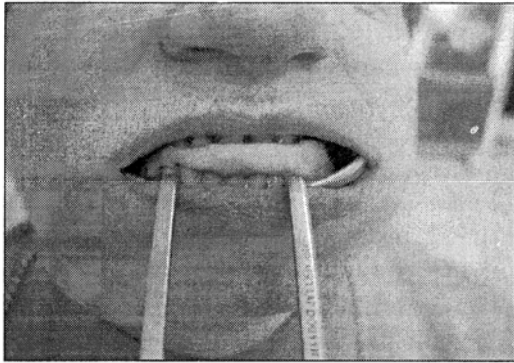


Figure 1

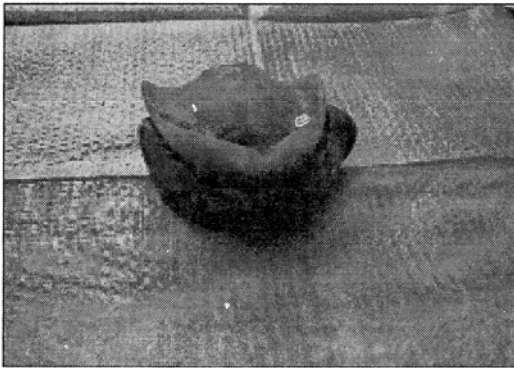


Figure 2

be used for mounting the models in the articulator. The stage of the complementary examinations follows, a very important role being played by the C.T. (Figure 3)

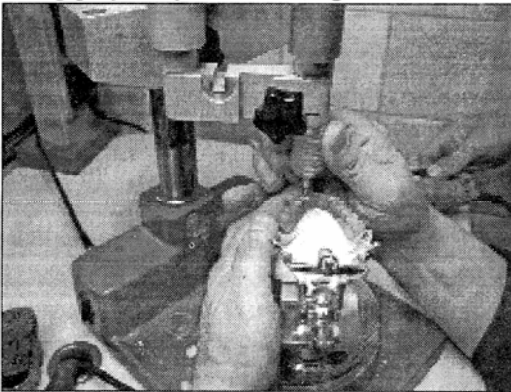


Figure 3

Before the surgical stage, the radiological and C.T. Scan evaluation are realized using an X-ray guide, made by transforming the periimplantar denture into a transparent acrylic denture. The maquette of the radiological guide is firstly made.

In the center of each tooth of the radio-

logical guide maquette, holes are made using the parallelograph, having 3.4-4mm in diameter (the standard diameter of the

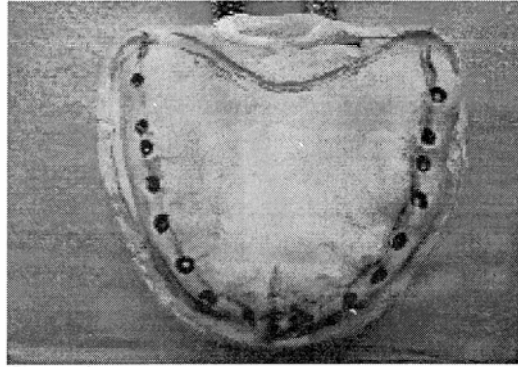


Figure 4

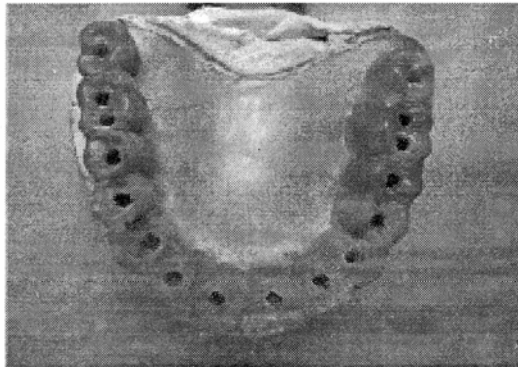


Figure 5

majority of implants). (Figure 4, 5)

On the models, the corresponding area of the inscription rod of the parallelograph is marked. (Figure 6, 7, 8)

The maquette is transformed into the radiological guide, which will have correspondent holes with the implants insertion axes. Inside of these holes gutta-percha is introduced because this does not distort the

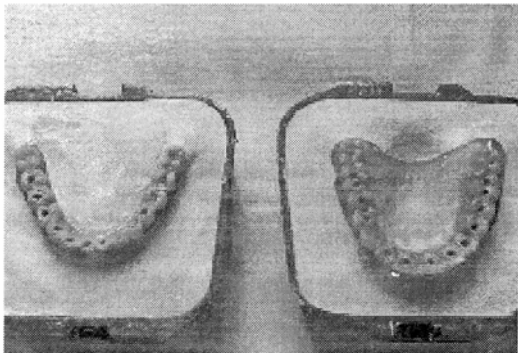


Figure 6

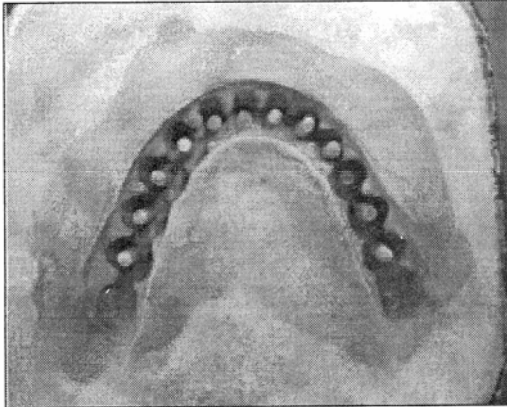


Figure 7

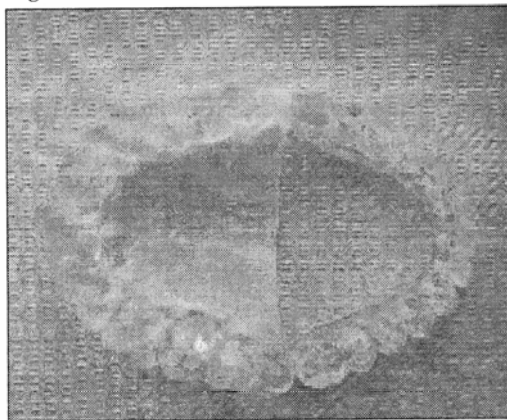


Figure 8

C.T image and does not produce unpleasant noises during the C.T. examination. For the maxilla, the area corresponding to the palate vault is removed, to allow the radiological guide to be easier used during the C.T. examination and the using of the surgical guide during surgery. (Figure 9)

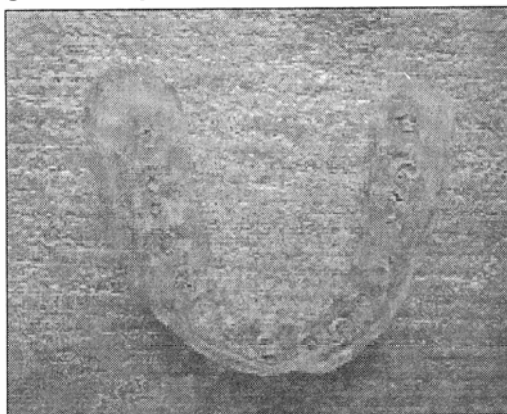


Figure 9

With the radiological guide in position the C.T examination is realized, selecting

the sections of the holes filled with gutta-percha in the clearest positions.(Figure 10)

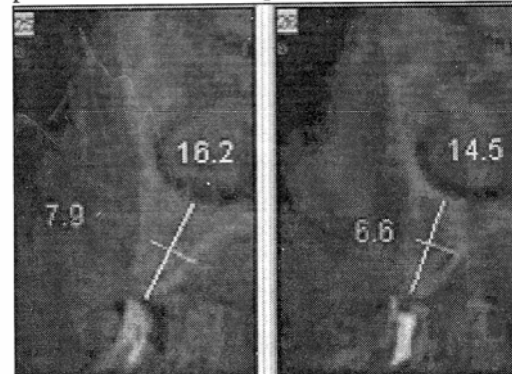


Figure 10

The obtained sections give us the proper dimensions in height and width of the edentulous ridge, followed by the decision to perform the bone graft or to introduce directly the implants with diameter and length which can ensure proper resistance of the rehabilitation.

In the day of the surgical intervention the venous interception is realized in order to be able to introduce antibiotics, anti-inflammatory drugs and to realize a conscious sedation. (Figure 11)

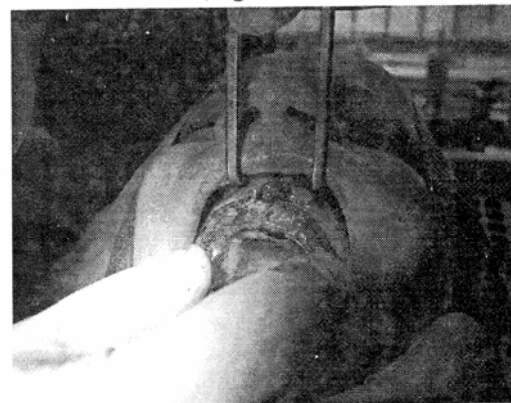


Figure 11

The local anesthesia is realized by using one of the classical techniques.

The radiological guide from which the gutta-percha was removed is repositioned on the alveolar ridge, and by using the driver drill the positions of the new alveolar sockets are marked through the correspondent holes (these will be measured only in

mesio-distal direction).

On the C.T. section we can see if an implant of 4 mm width can be correctly introduced (keeping a sufficient bone on the buccal and oral side) with an ideal inclination obtained on the parallelograph (the implants are parallel with the gutta-percha strip). If we observed that on the C.T. section the bone size is not enough bone augmentation can be used or preangulated abutments. The last ones do not transmit physiological forces and force us to use longer implants. Thus we know the inclination of the prosthetic abutments before the surgical stage and we can predict the force transmission at the implant-bone interface.

Practically, the sections from the C.T. scan are analyzed before surgery with the best clear image of the gutta-percha rod. Clinically, the same mesio-distal sections are obtained by positioning the surgical guide on the alveolar ridge and using the driver drill we marked the position on the cortical bone. (Figure 12)

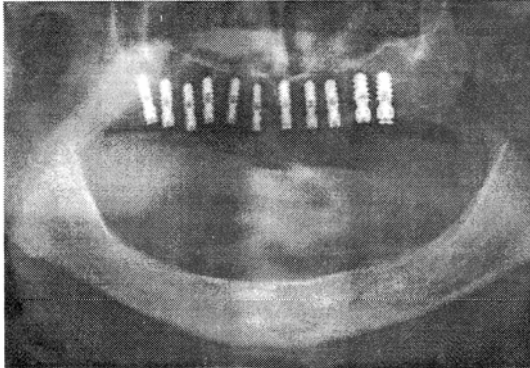


Figure 12

This radiography presents a clinical case, which was solved by using the above described techniques. (Figure 13)

After the end of the first surgical stage the patient will wear the periimplantar dentures, which were modified on the mucosal side by creating unloaded areas around the implants and by rebasing it with elastic materials.

The patient is examined every week to avoid the pressures on the implants or

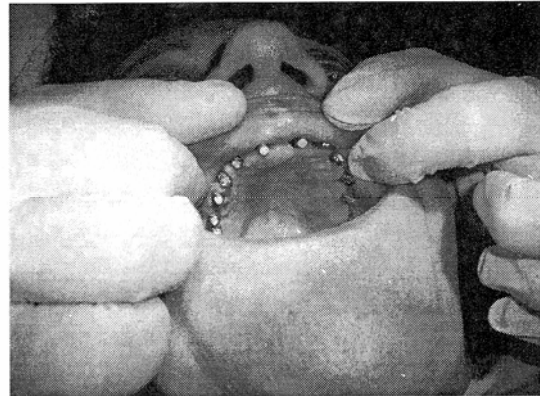


Figure 13
occlusal interferences due to the changing in the periimplantar denture support.

After 3 to 6 months (the period of physiological integration) the prosthetic abutments will be mounted with the proper angulation known before the first surgical stage (a few degrees difference, which can appear due to the modifications shown in the stage of implant insertion, can be corrected easily in the office and in the lab). (Figure 14, 15)

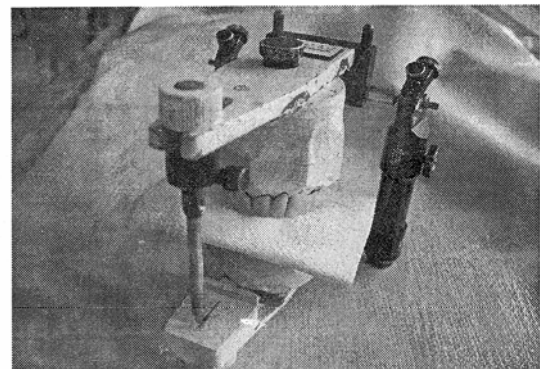


Figure 14

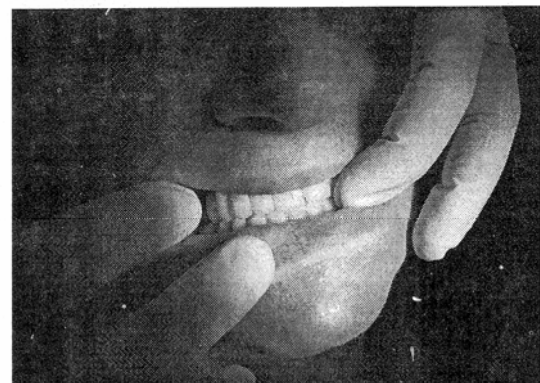


Figure 15

A radiological control is made concerning the abutment adaptation on the implants and the first acrylic denture with progressive loading is realized. The denture will be used 6-12 months depending upon of the bone quality that has been clinically determined during the making of the new alveolar socket. After the functional integration by progressive loading of the implants we can perform the final porcelain denture. This is made in a medium programmable articulator, the final adaptation being realized in the patient's mouth.

The occlusal forces should be directed perpendicularly on the occlusal plan without interferences.

The patient survey follows, which consists in the correction of the oral hygiene and also of the occlusal contacts; in the first year - once every three months and after the first year, every six months.

The technique presented allows, before the first surgical stage, the prediction of the relation between the occlusal plan, insertion

axis and the optimal dimension of the implant that will be inserted. Thus, it will remove the unpleasant situation caused by the overloading on the angled implants that are introduced in areas in which a bone graft should have been done first. It is considered that for the resistance of an angled implant, the implant should have a minimal length of 12 mm and 4 mm width for the maxillary implant and 10 mm length and 4 mm width for the mandibular implant. The dimensions increase with the angulation of the implant.

When the C.T. Scan sections predict that the bone support is not enough and the possibilities of bone implant are reduced it is preferable to use overdenture in order not to risk overloading the implant and compromise the treatment.

By the help of the above presentation I hope I succeeded to explain the importance the C.T. examination, using the periimplant denture transformed in surgical guide, stage that should be mandatory.