Romanian Journal of Rhinology, Vol. 1, No. 3, July - September 2011

CASE PRESENTATION AND ORIGINAL APPROACH

Immediate loading after external sinus lift on an osteoporotic patient - case study

Horia Mihail Barbu[1], Raluca Monica Comaneanu[1], Doina Lucia Ghergic[1], Adi Lorean[2], Ziv Mazor[3], Robert A. Horowitz[4], Constantin Dumitrache[5]

[1]Faculty of Medicine and Dental Medicine, „Titu Maiorescu" University, Bucharest;
[2]Tiberias, Israel; [3]Ra'anana, Israel
[4]College of Dentistry, New York University, USA
[5]University of Medicine and Pharmacy „Carol Davila", Bucharest

ABSTRACT

Today, oral implantology has become a vital part of prosthetic for partial and total edentulous patient rehabilitation1. Immediate loading in lower dental arch has, in most cases, a very good predictability2. Unlike the mandible, immediate loading of the upper jaw is possible only in few cases due to lower bone density at this level, which often requires a longer period of time for implant integration3. Using SimPlant software in implanto-prosthetic treatment planning allows for shorter treatment duration, fewer treatment sessions, a quick restoration of dento-maxillary functions, and last but not least providing the patient with a chance for rapid reintegration into society.

KEYWORDS: sinus lifting, dental implant, immediate loading, SimPlant, immediate provisionalisation, resonance frequency analysis.

INTRODUCTION

Immediate loading in the lower dental arch has, in most cases, a very good prognosis. Statistics from the literature show that a successful prosthesis in total edentulous mandible implant usually requires five implants longer than 11.5 mm and with at least 3.75 mm diameter.

Unlike the mandible, immediate loading of the upper jaw is possible only in few cases because of lower bone density at this level, which often requires a longer period of time for the integration of implants[3].

In the past, the maxillary sinus was considered as a region to be avoided in most prosthetic surgical procedures.

Indication for sinus-lift procedure is a trabecular bone with less than 10 mm height and less than 4 mm width, in circumstances where an associated sinus disease is not present.

General contraindications to this surgical procedure are: irradiation treatment of the maxillary region, sepsis, uncontrolled systemic diseases, alcohol and tobacco, drugs, mental illness, and **local contraindications** are: maxillary sinus infection, cysts, chronic sinusitis, postoperative alveolar scars, odontogenic infections, inflammatory or pathological lesions, severe allergic rhinitis[1,4,5,6].

MATERIAL AND METHODS

Patient: AB, aged 55 years, sub-total edentulous jaw without prosthesis (three mobile teeth on the arch in frontal region) has appeared in the dental office asking for specialty treatment. After analyzing the patient's history, the objective clinical examination and the imaging examination, the patient was informed about treatment options that may be considered in his case. It was decided to carry out extraction of remaining teeth on the jaw and placement of a prosthesis supported by endooseous implants after augmentation of distal residual ridges. For this pur-

Corresponding author: Horia Mihai Barbu, Bucharest, Romania,
email: horia.barbu@gmail.com

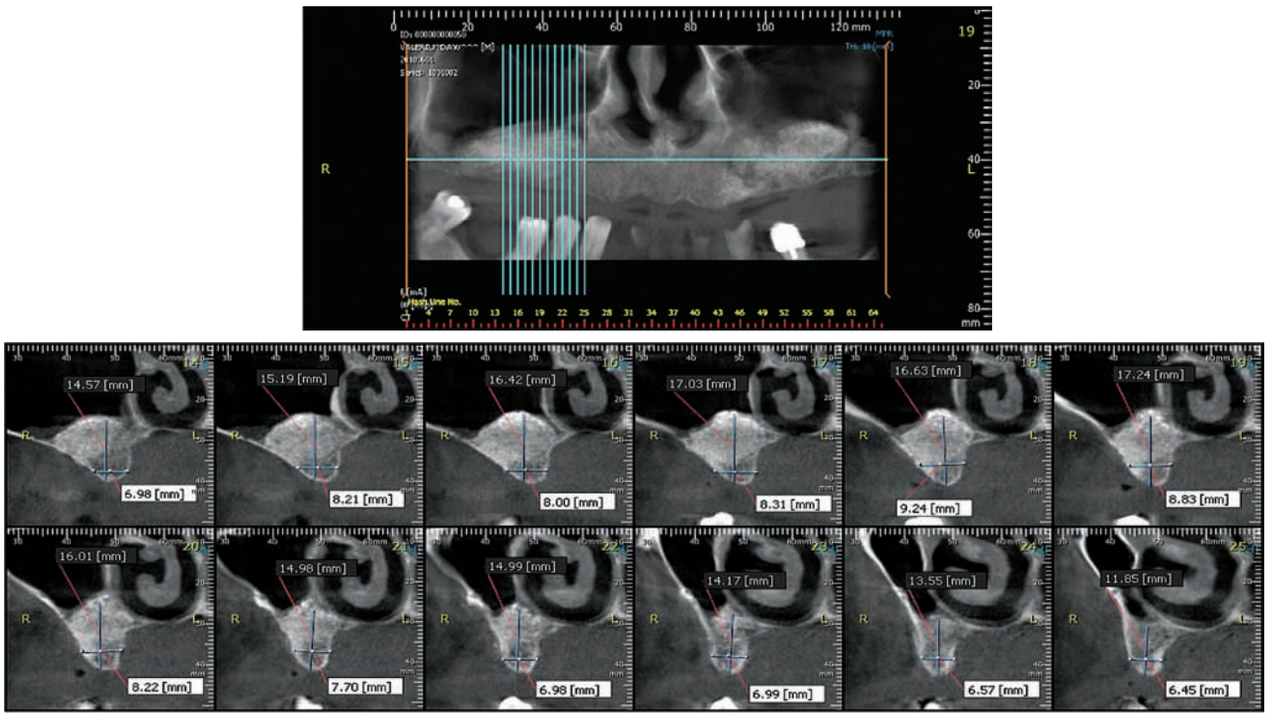

Figure 1 – CT 10 months after maxillary sinus lift.

pose a set of biological constants tests was recommended to the patient in order to see if long term prognosis and healing duration could be influenced. After tests, it was discovered that the patient had inactivity osteoporosis that modified treatment plan by inserting a greater number of dental implants and by prolonging the estimated healing duration.

Maxillary sinus lift was done bilaterally using, as supplementary material, Bio-Oss xenograft (Geistlich, Pharma AG) and Bio-Gide membrane (Geistlich, Pharma AG). Because of the reduced initial subantral availability and osteoporosis, dental implant insertion was delayed.

The patient was ambulatory treated for 10 months during which he received a total prosthesis that allowed him to reintegrate into society.

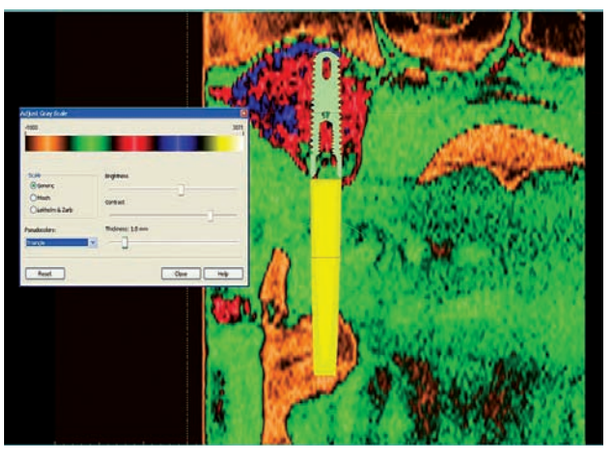

Figure 2 – Establishing bone density with SimPlant software.

Before inserting the dental implant procedure, a new paraclinical imaging exam was recommended, that would allow us a quantitative assessment of the new formed bone. For that purpose, we have requested a Cone Beam Computed Tomography (CBCT- Planmeca, Finland), which allowed us to measure the height and thickness of the jaw (Figure 1). To accurately determine bone density, needed to establish the correct indication of treatment, we used SimPlant software (Dental Material, Belgium). With its help, we were able to establish that bone density in sinus graft is type III after Zarb and Lekholm (type 4 after Misch) (Figure 2).

The density of the new formed bone obtained by grafting, allowed us to plan (Figure 3) the insertion of 10 implants in maxillary arch, 4 of which in anterior region and 6 in the maxillary sinus region (17-16-15-13-12 and 22-23-25-26-27 positions). We chose 3.75 mm diameter implants, eight of which were 13 mm long and two 16 mm long (23 and 26).

For effective treatment we decided to use SimPlant guide (Figure 4), which allowed applying, immediately after surgery, a temporary fixed prosthetic restoration (Figure 5).

To get a better primary stability, in 13-12-22-23 positions the implants were inserted as to be fixed bicortical, both at the edentulous crest and the nasal floor.

In order to prepare the new dental implants alve-

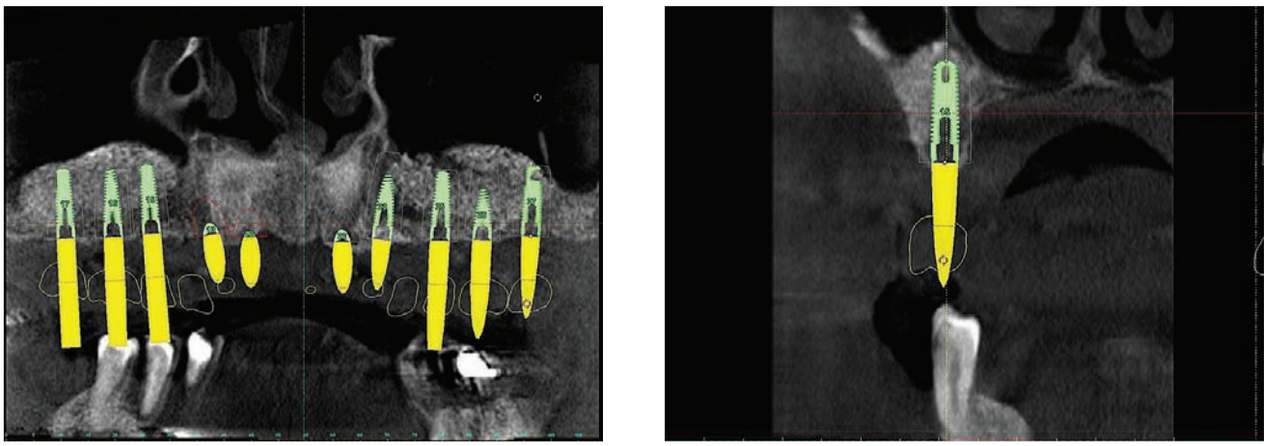

Figure 3 – Implanto-prostethic treatment planning with SimPlant software.

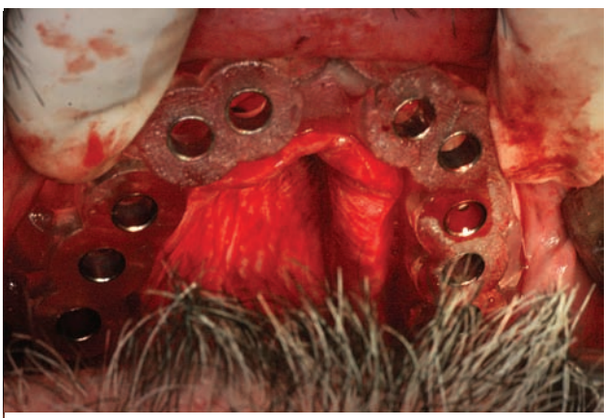

Figure 4 – Applying the surgical guide.

Figure 5 – Measuring the insertion torque.

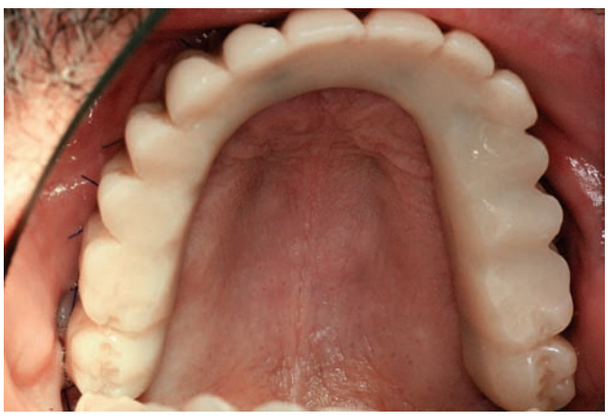

Figure 6 – Immediate provisional bridge.

Figure 7 – A second temporary bridge applied after sutures removal.

olus, an incision was made on the ridge crest, from a maxillary tuberosity to the other, elevating a full mucoperiosteal flap needed to expose the surgical field. The surgical guide was fixated anterior on the vestibular area of the crest with two 1.5 mm diameter and 10 mm long osteosynthesis screws (Aesculap, B. Braun, Germany).

After performing the ten osteotomies, the surgical guide was removed and the 10 dental implants (Touareg, Adin, Israel) were inserted. For each implant, primary stability was measured with resonance frequency analysis (Osstell AB, Sweden). Implant stability quotient has varied between 72-83 ISQ. These ISQ values associated with insertion torque measurements (45-70 N/cm) allow us for immediate loading of the implants.

During the same session, an impression of the prosthetic field was taken in order to manufacture a

second prosthetic provisional bridge, reinforced with a special metallic bar to obtain a better resistance, while reducing its buccal-oral dimensions. After the impression, 10 prosthetic abutments were placed on the implants (eight straight and two angulated at 15°) and immediate provisionalisation was performed using a special acrylic bridge that was delivered together with the surgical guide (Figure 6).

Seven days after surgery, sutures were removed and the immediate provisional bridge was replaced by a second temporary bridge reinforced with a palatal metallic bar (Figure 7). Final prosthesis will be placed 8 months after implant insertion.

RESULTS

The aims of modern dentistry is to restore functionality, physiognomy, phonation, comfort and patient's quality of life improvement.

As a result of continuous research in implant's design, surgical techniques, diagnostic features, implanto-prosthetic treatment success has become a reality for patient rehabilitation in many difficult clinical situations[1,3].

Oral implantology has become a vital part of today's prosthetics in order to rehabilitate total and partial edentulous patients.

Paramount importance in implanto-prosthetic treatment success is biological tissue response to mechanical loading. These pressures can vary dramatically in intensity, frequency and duration, depending on each patient's masticatory engram[3].

The current trend is to make possible the immediate loading of implants, so that healing is accelerated as a result of new bone formation stimulation by masticatory forces.

CONCLUSIONS

Using SimPlant software in implanto-prosthetic treatment planning allows for shorter treatment duration, fewer treatment sessions, a quick restoration of dento-maxillary functions, and not least providing the patient a chance for rapid reintegration into society.

REFERENCES

1. Misch C.E. – Implant Dentistry. Second Edition, Ed. Mosby 1999.
2. Davarpanah M., Szmukler-Moncler S. – Immediate Loading of Dental Implants: Theory and Clinical
4. Practice. Ed. Quintessence International, 2008.
3. Misch C.E. – Dental Implant Prosthetics. Ed. Mosby, 2005.
4. Khoury F., Antoun H., Missika P. – Bone Augmentation in Oral Implantology. Quintesscence Pub., 2007.
5. Jensen O.T. – The Sinus Bone Graft. Second Edition, Quintesscence Pub., 2006.
6. McDermott N.E., Chuang S.K, Woo V.V., Dodson T.B. – Maxillary Sinus Augmentation as a Risk
7. Factor for Implant Failure. JOMI, 2006,p21:3.