**SELF BONE GRAFT AND SIMULTANEOUS APPLICATION OF IMPLANTS IN UPPER JAWBONE**

P. VITTORINI VELASQUEZ*, G. FALISI**, M. GALLI***

* MDS, ** PhD, DDS
*** MD Professor Sapienza University of Rome

**SUMMARY**

Self bone graft and simultaneous application of implants in upper jawbone.
The implant supported rehabilitation of upper back sectors, sometimes, is conditioned to the pneumatization of the jawbone and so, reducing the possibility to apply the implants when the bone portion is inferior to 4 mm (important condition for the primary stability).
The great rise of the jawbone and the simultaneous application of implants is, surely, the condition to have the best success guarantees compared to the only application of filling material.
The surgical technologies used in the self bone grafts are various (ilium crest, calvaria, fibula) and so also for implant applications.

In this article we want to put in evidence a new technology in order to reduce at the minimum the invasive surgery of the removal and the patient morbidity.

It has been executed a longitudinal study on 21 consecutive cases and illustrated by a clinical one: the success was of 94.5%. The advantages of this technique are:
1) Functional and anatomical recovery of the jaw cavity
2) Immediate application of implants with a thickness of remaining bone in fervor to 4 mm.
3) Reduction of surgical times
4) Reduced morbidity of the patient
5) Local an anesthesia.

**Key words:** Self bone graft, jawbone surgery, simultaneous implants.

**Introduction**

The pneumatization of the jawbone is frequent when there is a loss of teeth elements, causing a reduction in vertical sense of the bone condition, limiting the insert of implants for prosthesis recovery aims.

The approach to this anatomic zone has been always disputed, for the surgical approach as well as for postsurgical complications.
Different techniques have been introduced in order to bypass this zone; use of pterygoid implants and transzygomatic ones, even though with this late technique the jawbone is anyhow invaded, to search the bicorticalism and obtain the primary implant stability.
When the bone surface is higher than 4mm, the international literature allows the filling of the jawbone and the simultaneous setting of implants, while in case the bone surface is inferior to 4 mm. Misch classification (4) is important to operate with a first reconstructive-regenerating phase, and then pass to a second surgical phase to insert implants. Some authors (5) suggest the possibility of implants in the same surgical moment with the use of an extraoral self bone graft (fibula or hip) in order to obtain the primary stabilization; this technique has, however, different disadvantages:

- The need of a protective environment, private clinic or hospital, in which it is possible to operate in total anesthesia.
- The removal of the giving zone must be effected by a qualified operator (orthopedist).
- The deambulation of the patient and his morbidity.
- The high cost, biological and economic.

Under these considerations, the authors want to present a new alternative surgical technique allowing the simultaneous insertion of implants where the bone height is inferior to 4 mm, with the removal of the graft in intraoral zone and local anesthesia.

### Materials

At the Clinica Dentomaxillofacciale Vittorini Sangueza, Cochabamba, Bolivia, between 2002 and 2003 about 400 patients were visited for the supported implants rehabilitation of superior back sectors. All patients have been studied according to our clinical implant protocol, for a successful prosthesis rehabilitation. During this period patients have been selected through the following standard of exclusion and inclusion in a group of study consisting of 21 patients.

**Exclusion standards:**
- Insufficient dental care
- Acute and chronic sinusitis of the jawbone
- Patient with high risk factors
- Patients undergoing Cadwell Luc treatments
- Patients having radiotherapy
- Patients with a bone height superior to 4 mm.

**Inclusion standards:**
- Bone height inferior to 4mm. by means of x-ray
- Bone disposal of the removal zone in jaw ramus-symphysis
- Permission of the patient to participate at study
- The will to submit himself to the clinical periodic follow up.

330 patients were excluded of the total 400. Among the selected ones, 30 have not consented the treatment, 19 have not submitted themselves to the follow up, the remaining group was composed of 21 patients.

Among the 21 ones, 13 were men of about 58.2 years old, and 8 women of about 59.8 years old. In all patients we have inserted cone implants and the surface was treated with Tps in combination with SLA (micro-porous surface and plasma spray). The total number of implants was 37, so distributed: 6 in zone 16; 3 in zone 17; 12 implants in zone 26; 11 in zone 27.

The length of inserted implants has been of 11.5 mm for 16 ones and for 21 implants of 13 mm with a diameter of 3.75 mm (schedule 1).

All implants have been submitted to a functional and progressive charge after 6 months from the insertion.

### Surgical technique

Asepsis of surgical portion: intraoral with mouthwash of clorexidine gluconate at 0.2% for 2 minutes, extraoral with Povidona (polivinilpirrolidona PVP). Isolation of surgical zone with sterile materials. Local anesthesia with mepivacaine chloride at 1:100.000 ui, in the troncular and plexus jawbone (retro-molar trigon, vestibular palatal and retro-incisor duct), troncular jaw and plexus vestibular.

### Preparation of the receiving site

Edge design, primary crestal incision and second release incisions in all thickness (trapezoidal edge). (Fig. 2).
Edge decollement by means of Freeman periosteal elevator (Fig. 2).
Exposure of vestibular cortical bone surface of the malar up to the retro molar tuberosity (Fig. 2).
Osteotomy of the vestibular wall of the jawbone by means of a vibrating saw (Fig. 3).
The detachment of osteotomized wall with the exposure of Snaider membrane. The bone fragment of the hole is placed in a sterile container in which there is physiological solution in order to prevent the dehydration (Fig. 4).
The Snaider membrane decollement is executed starting with the back portion and then front and inferior one with delicate movements to achieve the complete detachment exposing the bone portion of the medial wall of jawbone (Fig. 4).
Washing of oral cavity with an antibiotic solution (gentamicina 80 mg).

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It is also prepared the implantologic surgical tooth socket.
In order to maintain the new membrane position, a tnt gauze soaked in the same antibiotic solution used for washing, is inserted.

Preparation of donor site

Edge design, primary paramarginal incision following the fore board of the jawbone ramus, starting with the retromolar trigone and ending in the distal zone of 4.6 (Fig. 5).
Whole thickness décollement

Preparation of the surgical tooth socket in the same manner we want to place the implant executing all the passages of the cutters to prepare the tooth socket and the edging (as in the fit to fit technique) (Fig. 6).
The successive phase provides the use of trephine with a diameter of 8mm. to execute the osteotomy and the removal of the bone to graft (Figs. 7-8).
Under physiological solution jet, the implant with graft is proved and it is possible to value the friction level and the adaptation (Fig. 9).
Application of implant and graft in the receiving zone (Fig. 10).
Spaces filling with self bone or/and filling material (Figs. 11-12).
Repositioning of the bone hole (Fig. 13).
Suture with separated stitches.
Results

The test of results, obtained from the follow up enabled to carry out the following evaluations (list.2). The follow up has been executed following the clinician and radiographic dictates (OPT), to prove the osteointegration and stability as well as the empiric test of percussion and, also, the control torque of 30 newton one.

After three months among 37 implants, at the first clinical and radiographic control, in the grafted implants and surrounding tissues and clinical and radiographic modification was noticed.

Six months later, with the beginning of the implan-
Figure 12
Application.

Figure 13
Repositioning of the bone window.

Figure 14
Ray inspection.

Figure 15
Application of abutment after 6 months.

Table 2 - Follow-up.

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Due to functional reasons, 2 implants (5.5%) were lost, one because the patient has continued to wear a mobile prosthesis, the other because the implant has not been osteointegrated, while the remaining 35 patients (94.5%) had a good stability.

After the final rehabilitation of the 35 implants, in controlling them after 1-2-3-5 years, there were no radiologic changes but only the classical ones as those from function (marginal crestal reabsorption) and clinical with a negative perimplant probing.

Discussion and conclusions

The self bone intraoral graft, for the reconstruction of the jawbone and the simultaneous implants application, allows the reduction of surgical times in order to have a primary stability necessary for the osteointegration, and so for the prosthesis rehabilitation implant supported.

The disadvantages

1) The impossibility to use implants with a diameter superior to 3.75 mm; so because the use of superior diameters would involve a fracture of the graft during the screwing phase.
2) The bone graft can not be superior to 8 mm. of diameter for the anatomical structure of oral cavity.
3) Impossibility to use this technique when there is the need of the onlay graft.

The benefits are

1) Functional and anatomical recovery of the jawbone cavity.
2) Immediate application of implants having a remaining bone thickness inferior to 4 mm.
3) Reduction of surgical times.
4) Reduced patient morbidity.
5) Local anesthesia.

This method is surely a therapeutical alternative, appointed the clinical results comparable to other techniques described in medical literature, but it needs a histomorphometric study and a larger specimen.

Clinical case

A 53 years old patient, with the need of a prosthesis rehabilitation in the left superior sector, zone 2.6, with a bone surface in height inferior to 4 mm.

References


Correspondence to:
Dott. Giovanni Falisi
Via del Vivaio 19 - 00172 Roma
Tel.: 062304775
E-mail:g.falisi@tiscali.it