

Implant rehabilitation with Strategic Implant® technology in two stage implants – bone addition, sinus-lift failure (cases presentation)

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ABSTRACT

In this article, the authors want to present the possibilities of solving some difficult cases, treated in a conventional surgical and implant manner and which were a failure, as well as the possibilities of avoiding these failures using Strategic Implant® technology.

In the first case presented, the patient goes through bone augmentation procedures, without reaching the time of implant insertion and prosthesis, with the loss of bone addition on one side of the mandible, the case being later completed with corticobasal implants in immediate prosthetic loading.

The second case in which the patient successively loses the inserted two stage implants, without reaching their functional load, resorts to the treatment with corticobasal implants in immediate loading and the fixed prosthetic restoration of the mandible in 3 days postimplantation.

The last case in which the patient comes for the removal of a maxillary prosthetic work fixed on 4 two stage implants with bone addition and unilateral sinuslift, with mobility, and in which the treatment with corticobasal implants and fixed prosthetic work in 3 days was the optimal way of treatment.

These cases as well as the feedback of the treatment after a number of years show us that the treatment with corticobasal implants can be made much easier using only the native bone of the patient using implants that adapt to the morphology of the existing bone and a immediate loading protocol to allow the optimal functioning of prosthetic works; knowledge of surgical and prosthetic protocols of Strategic Implant® technology lead to predictable prosthetic results with minimally invasive surgery, without sinus lift and bone addition, in a short time of 3 days from the surgical step until the final oral rehabilitation.

Keywords: immediate functional loading, Strategic Implant® technology, bone addition, sinus lift, corticobasal implant

INTRODUCTION

Strategic Implant® technology represents the technique for inserting and fixing specific corticobasal polished implants, without gingival flap, in the second cortical bone (the second cortical being represented by the cortical opposite the entry area into the jaw bone) and/or the third cortical (represented by other than the jaws – zygomatic bone, sphenoid bone). Implant placement in strategic position in the

maxillary and mandibular bone (nasal cortical, sinus cortical, junction of the jaw with the sphenoid bone – pterygoid plateau, mylohyoid line, interforaminal area)

Along with the surgical phase, the prosthetic stage is essential in the long-term preservation of the surgical result. The implants can be parallelized, by bending the prosthetic head (abutment), in case of fixation in the corresponding cortices, and this

supports a better design and an easier insertion of the prosthetic lab work.

In case of marked atrophies, the compliance with the supporting polygon in the static and dynamic occlusion, represented by the area of fixation of the implants in the bone, is essential. Full arch rehabilitation on immediate loading implants represents in this case a better option than segments with regards to cross arch stabilisation and deviation of forces inside the supporting implants polygon. Removal from the area of occlusal interference of the frontal group, by overbite 0.5 mm and overjet 2 mm, leads to the preservation of masticatory forces only at the premolars and the first molar, the lever of tilting forces being thus avoided in the frontal area. Also, the use of distal implant support areas leads to the avoidance of situations in which the prosthetic distal area becomes a lever. In segments with immediate loading implants, the supporting polygon is dramatically reduced so the number of implants must be increased in order to support masticatory forces and also prosthetic occlusion must be of lingual type [1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16].

OBJECTIVES

This article highlights the benefits of using strategic implants in cases of major bone deficiencies, in cases where conventional dental implants or bone augmentation have failed. In the case of marked atrophies, both in the maxillary and mandibular bone, the technique of using strategic corticobasal implants is the main way of implant rehabilitation.

The patients were informed and expressed their consent according to law 46/2003.

CASES PRESENTATION

Analysing the following three cases, we can distinguish how the treatment with corticobasal implants strategically placed in the maxillary or mandibular bone according to procedures in accordance with the rules of evidence, consensus and scientific protocol S3, led to prosthetic restoration of these patients, by immediate loading with fixed prosthetic works, in 3 days, and the sustainability in time of this system.

Case 1

Patient, M.A., 50 years old, smoker 18-20 cigarettes/day, without associated diseases.

The treatment plan includes the rehabilitation of the posterior mandibular region with fixed prosthetic to restore masticatory function (Figure 1).

The initial treatment began with the extraction of root residue 34 and the addition of autologous bone, harvested from the bilateral mandibular branch which proved to be a failure on right patient side (Figure 2).



FIGURE 1. Panoramic radiography, June 2017. Prior to the bone addition, the premolar root 34 maintains the bone in that area



FIGURE 2. Panoramic radiography, October 2017. After post-extraction healing, bone support is lost in region 34, being replaced with bone addition; reconstruction is performed in both quadrants

In those two quadrants after our immediate loading treatment with Strategic Implant® protocol, there is no difference in the treatment of the area with the remaining addition compared to the one with the addition of lost bone. Moreover, marked atrophy can be observed in quadrant 3 first premolar, which could have been avoided by inserting a corticobasal implant immediately post-extraction (Figure 3).

The patient comes after more than a year of waiting, during which time the bone reconstruction in quadrant 4 is lost.

The treatment plan included the insertion and fixation flapless of 3 BCS implants, through the Strategic Implant technique, in each quadrant and the



FIGURE 3. Post-implantation radiography, April 2019. BCS corticobasal implants discipline no. 3 and 5 are used for implant fixation



FIGURE 4. Panoramic radiography, August 2021 – 2 years and 4 months after insertion of BCS implants and prosthetic completed

prosthesis with metal-ceramic works, definitively cemented 3 days after the insertion of the implants in both quadrants: 1 implant on each side fixed medially to the chin hole in the interforaminal area, discipline no. 3, 2 implants on each side at the mylohyoid line, discipline no. 5.

After insertion regarding the implant placement and torque (over 50 N.m), they were parallelized by bending to simplify the prosthetic step and grinding to let a sufficient space for prosthetic (Figure 3).

Through prosthetic rehabilitation, an equal number of masticatory units are obtained in the molar-premolar area, in both quadrants, so the patient regains the masticatory function and an occlusal height (DVO) corresponding to the facial planes (Figure 4).

Case 2

Patient M.I., 65 years old, presenting monitored hypertension, without other associated health problems.

The patient comes after two interventions performed in another clinic, in which, consecutively, the two stage implants that should have supported a mobile prosthesis are lost. The last implant (Figure 5) it is removed one month before rehabilitation with strategic corticobasal implants followed by fixed prosthesis in 3 days.

Due to the large bone loss in the post-implant interforaminal area and the risk of fracture of the mandible (Figure 6), an attempt was made to avoid this area, which is also the most used in terms of bone quality and quantity. Even in these conditions, 8 implants were inserted (Figure 7), and 3 days after the operation, a metal-ceramic prosthetic work was definitively cemented.

The implants were inserted as per the following protocol disciplines: 1 implant on each side in the canine area, interforaminal, discipline no. 2; 1 implant on each side in the second premolar area, be-



FIGURE 5. Panoramic radiography, September 2019. Initial situation; the last remaining implant with periimplantitis



FIGURE 6. Panoramic radiography, June 2020 – 1 month after removal of the last two stage implant

tween the lingual and vestibular cortex, discipline no. 6; 2 implants on each side distally in the second molar region, with insertion to the mylohyoid line, discipline no. 5.

After more than 1 year to the implant fixation and the prosthetic work cemented, bone healing can be observed in the interforaminal area, as well as the lack of negative changes in the corticobasal implants bone areas (Figure 8).

From a masticatory point of view, the patient opts for the continued use to the mobile prosthetic on the upper maxillary. This thing diminishes the quality of the mastication by decreasing the masticatory force.



FIGURE 7. Panoramic radiography, July 2020 – 8 corticobasal implants inserted in the 2nd cortex



FIGURE 8. Panoramic radiography, August 2021 – 13 months after implant fixation and prosthetic cementation; interforaminal bone recovery and implant position without negative radiological changes

Case 3

Patient P.D., 66 years old, no associated diseases.

The patient comes with peri-implantitis at the all 4 two stage implants, inserted both in the native bone and (in the premolar region) post sinus lift and bone addition (quadrant 1). Also, the fixed metal-ceramic work shows mobility (Figure 9).

After removing the two stage implants, in the same session the corticobasal implants are inserted in the strategic areas of the jaw (nasal cortex, sinus, sphenoid maxillary bone fusion area – pterygoid plate).

At the same time, the molar 48, the tooth in the extruded position is extracted. This tooth it may compromise the occlusal plane by interfering in lateral or anterior guiding movements.

The implant was fixed according to the protocol of the Strategic Implant® technique, as following: 2 distal implants on each side, in the maxillary fusion area, pterygoid plate, discipline no.10b; 1 implant on each side in the premolar area 1, fixed in the sinus cortex, discipline no. 8a; 4 implants in the frontal area, fixed in the nasal cortex, nasal spine, discipline no. 7a; 1 implant on each side in the canine region, fixed bicortically between the vestibular and palatal cortex, discipline no. 6.

The final metal-composite work is permanently cemented in 3 days (Figure 10).



FIGURE 9. Panoramic radiography, October 2019 – before the removal of compromised implants



FIGURE 10. Insertion of strategic implants immediately after removal of two stage implants



FIGURE 11. Panoramic radiography June 2021. After 1 year and 8 months, around the strategic implants the bone is stable, the occlusion is in the correct position

After 2 years, at the clinical and radiological examination, the patient does not show any negative changes (Figure 11).

The use of a metal-acrylic work, with prefabricated composite teeth, can lead in time to the modification of the initial occlusion, so that the front group can come in direct contact with the lower one, by losing the 1 mm overjet. This can lead to a functional overload of the frontal area, by turning it into a leverage. Prevention of this can be done either by using composite teeth with high Brinell index and/or occlusion checks with overjet restoration, by grinding, or by choosing metal-ceramic works.

DISCUSSION

Corticobasal implants with polished surfaces, fixed in the second cortical in immediate loading protocol in maxillary jaw with or without penetrating the sinus or nasal floor and mucosa are not prone to infections. In other studies overall survival rate of two stage implants into the sinus cavity was 95,6% without statistical differences according to the level of penetration.

In our clinic from 2014-2021 on 5,898 implants, 3 patient from 624 complained about sinusitis after implant treatment, provided that 80% from implants were corticobasal implants.

In 2019, the International Implant Foundation (Munich, Germany) published a consensus on Stra-

tegic Implant® technology, which is becoming a predictable discipline, and the large number of patients with difficult bone support conditions which was treated has increased. The surgical and prosthetic treatment planning are according with Wolff's law, only native bone is used.

Conventional dental implants have certain disadvantages, derived from the design, they need substantial quality and quantitative bone in order to be inserted. This leads to the need of bone reconstruction and sinus lift in some cases, which leads to a proportionate increase in the risk of failure.

The alternative bone addition and sinus lift increases the patient rehabilitation time with teeth from 9 to 12 months. The complications associated with maxillary sinuslift are diverse, only the rupture of this membrane in the sinuslifting protocol it is between 10-30% from the patients.

Bone augmentation with autologous bone is a successful procedure with only 9-10% failure ratio. This procedure however require two different sites operated (donor and acceptor site) with possible complications in each one. This surgical procedure is not required in Strategic Implant® technique.

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CONCLUSIONS

Strategic Implant® technology overcomes the major disadvantages of conventional implantology, as the implants can be placed immediately post-extraction, after removal of two stage implants, after loss of bone addition, in inaccessible areas with the restoration of the patient's function and aesthetics in just 3 days.

The treatments are usually performed in a functional immediate loading protocol and only native natural bone is used to fix the implants, therefore bone augmentations and sinus-lift are not necessary.

Initial use of Strategic Implant® technology with corticobasal implants in cases with moderate and advanced maxillary and mandibular atrophy, in which the use of two stage implants cannot be done under favorable conditions, can reduce the number of postimplant failures and avoided the sinus-lift or/and bone reconstructions. In fact, the latter are not required in the case of Strategic Implant technology, as evidenced by the cases presented above.