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Research Article

Vanderlim Transnasal Implant Technique: Origin, Concept, and Analysis of 100 Cases in 9 Years of Postoperative Follow-Up

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Abstract

Recent technological advances have enabled the oral rehabilitation of a significant number of edentulous patients with atrophic maxillae. Immediate loading procedures (All-on-4 type and variations) have become required in implantology clinics around the world. However, there are some patients whose bone anatomy is completely unfavourable, restricting the execution of these procedures. In these cases, the Vanderlim Transnasal Implant Technique is an option for anchoring the anterior region of the maxilla, providing prosthetic stability and lower surgical risk, eliminating complications associated with the Quad Zygoma protocol and overloading of the zygomatic bone.

Objectives: To present the technical evolution and results of the postoperative clinical follow-up of oral rehabilitation patients who underwent surgery to install transnasal implants (Vanderlim Technique) as an alternative to the of Quad Zygoma.

Methodology: Observational, longitudinal, retrospective clinical follow-up, performed with 100 patients undergoing the Vanderlim Transnasal Implant Technique, with an average follow-up time ranging from 2 to 108 months.

Results: The severe maxillary atrophy combined with the incipient zygomatic bone structure led these patients to undergo surgery to install transnasal implants-the Vanderlim Technique. During surgical planning, it was decided to install two transnasal implants in the anterior region associated with two (or more) posterior implants.

Conclusion: After 9 years of regular use of the Vanderlim Technique and 100 patients treated at the Ciipo Clinic in Florianópolis, the results presented were quite encouraging, with a success rate of 100%. It is concluded that the Vanderlim Technique is a safer option compared to the risks associated with the Quad Zygoma procedure in patients with unfavourable anatomy, presenting itself conceptually simpler and more economical, allowing prosthetic stability, cantilever reduction, and greater patient comfort.

Keywords: Implantology; immediate loading; transnasal implants; vanderlim technique

Introduction

The technological revolution has reached dentistry. Over the past three decades, new equipment, techniques, and solutions have enabled diagnoses, treatments, and surgical procedures to be performed with a level of precision and safety never before seen. In implantology, this is no different. Innovative techniques and protocols are offering increasingly effective alternatives for patients who previously had to endure palliative, dysfunctional, and highly uncomfortable solutions [1]. A direct consequence of this progress is the growing global demand for immediate loading procedures. This trend is particularly evident among partially or fully edentulous patients with severe maxillary atrophy. Often dissatisfied with their current prosthetic solutions-typically mobile or removable dentures-these individuals seek definitive treatment in implantology clinics. Immediate loading has emerged as a promising solution, allowing for rehabilitation in a short period while eliminating the need for bone grafts. In addition to being fast and cost-effective, immediate loading restores function, aesthetics, and self-esteem, thereby enhancing patient safety and quality of life [2-4].

One of the most widely used immediate loading procedures worldwide is the All-on-4, which uses four implants to anchor a fixed prosthetic arch of 12 (or 14) elements. In its variations, the All-on-4 technique can be associated with two long implants in the zygomas (hybrid All-on-4) or four implants in the zygomas (zygomatic All-on-4). The types of implants to be used and the exact location of the installation will be defined after careful analysis of the patient's remaining bone conditions via imaging exams and simulation in biomodels. In cases of severe maxillary atrophy, the literature recommends the use of long implants with double or quadruple anchorage in the zygomatic bones. However, during the planning phase, the surgeon may encounter insufficient zygomatic structures, which make the procedure difficult or unfeasible. In these situations, the transnasal implant-Vanderlim Technique-is a surgical alternative to be evaluated by the dentist. In addition to providing quality anterior anchorage points, it reduces overload on the zygoma, enabling immediate loading with a lower risk of complications [5]. In this retrospective longitudinal study, post-surgical observation data were collected from 100 patients who received transnasal implants (Vanderlim Technique) over a period of 9 (nine) years.

The follow-up period ranged from 2 to 108 months. Surgical planning, surgery, prosthesis installation, evaluation of return, and regular follow-ups were performed by the same technical team in a private clinic (Ciipo, Florianópolis), under the technical supervision of Dr. Vanderlim Branco Camargo. For better evaluation and formation of evidence, preoperative health variables, surgical planning, implant characteristics, recovery history [6-9], and recent condition of the patients were collected. Technological evolution has provided more assertive solutions in several areas of science, including implantology. The All-on-4 immediate loading concept (and its variations) is one of these revolutionary innovations, as it offers a safer, more comfortable, aesthetic, hygienic, and definitive solution for patients with atrophic jaws, avoiding the discomfort of removable prostheses (dentures). The All-on-4 standard technique was developed by Portuguese dentist Dr. Paulo Maló in 1993, proposing a solution with immediate loading for patients with little maxillary (or mandibular) bone structure. The technique consists of installing four angular (inclined) implants distributed evenly in the remaining bone structure of the maxilla/mandible, two anterior and two posterior (first or second premolar region), with variations possible, depending on the clinical evaluation and surgical planning.

The conceptual simplicity of the All-on-4 technique, combined with its excellent results, quickly gained the trust of professionals worldwide. Professor Maló innovated by providing a definitive solution for numerous adverse clinical conditions that bothered a significant number of patients who were condemned to wear removable prostheses for the rest of their lives. The All-on-4 technique enabled faster oral rehabilitation, providing immediate loading and eliminating, initially, the need for bone graft surgeries. However, despite the immense success of the technique, over the years it was found that the standard All-on-4 immediate loading procedure had some technical limitations. Although it could solve a large number of clinical cases safely, practically, and economically, the technique could not be indicated for cases of severe maxillary atrophy. Patients with these characteristics did not have sufficient minimum conditions for anchoring the angular implants, preventing the procedure from being performed in its original form (standard All-on-4).

Thus, in the absence of options, bone grafts were once again required in these cases; however, they were known to be time-consuming, expensive and with uncertain results. Furthermore, from a technical point of view, the procedure would involve delicate areas, and the risks could outweigh the benefits. This technical bottleneck of severely atrophied jaws needed to be resolved, and new solutions were needed.

In the search for alternatives for these patients, the option of using more distant anchor points in the zygomatic bones with long titanium implants emerged. This technique had been developed a few years earlier by the Swedish orthopedic doctor Per-Ingvar Brånemark for the rehabilitation of accident patients, post-surgical patients for tumors, or patients with congenital malformations. This solution, although surgically more complex, began to be used in oral rehabilitation and, over time, proved to be effective. It became known as hybrid All-on-4 and its variant, zygomatic All-on-4. The hybrid All-on-4 technique has emerged as an option to overcome severe maxillary bone loss and avoid bone grafts, ensuring immediate loading. The combination of two angular (or regular) implants with two long implants anchored bilaterally in the zygomatic bones has become an alternative [10]. This procedure uses two different implant installation techniques, providing safety and stability for the prosthetic arch. The hybrid All-on-4 technique may undergo slight variations due to the characteristics and remaining bone anatomy of the patient and may evolve to five or six implants.

The zygomatic All-on-4 (or Quad Zygoma) is a variant of the standard All-on-4 and hybrid All-on-4 techniques for cases where there is no significant bone structure (for implant anchorage) in the anterior region of the maxilla. In these cases, two long implants are installed in each zygomatic bone, on both sides, for a total of four implants. Although it is considered safe and quite effective, this type of surgery requires advanced knowledge, a hospital team, and a rigorous prior evaluation of the procedure using software and simulation in bio models (resin prototypes). In implantology, surgical planning is essential. At this stage, key points are defined for the success of the patient's rehabilitation. The procedure for installing and anchoring implants in the zygomatic bones is not simple, nor is it free of risks. Tissue detachment, milling direction, the exact point of access and anchorage, as well as characteristics of the patient's bone anatomy deserve special attention from the professional. These issues must be reviewed repeatedly during the surgical planning phase.

Aiming to provide more predictable and safe surgical procedures, protocols were created and presented by Profs. Edmond Bedrossian (Maxillary Zones and Guidelines) and Carlos Aparício (ZAGA) based on years of research and observational studies. These protocols significantly reduce the risks associated with the procedure and are essential for defining with greater precision the patient's bone characteristics, the type of implant, the entry and anchorage site, and the technique to be applied. However, during simulation in software or prototype, the dentist may find that the trajectory of the anterior zygomatic implant is dangerously close to the orbital cavity and the infraorbital nerve [11]. In these cases, the procedure would be classified as high risk, and the execution of Quad Zygoma would be inadvisable. The immediate loading protocol would be postponed for a few months, and bone grafting would be the only solution for this patient's condition.

As a surgical alternative to these unfavorable Quad Zygoma situations, transnasal implants (Vanderlim Technique) are presented as a conceptually simple, safe, and highly effective option. In this technique, the implants are fixed in the remaining bone structure in the conchal crest region of the maxilla, emerging in Zone 1 anterior of the maxilla, providing high torque and considerable joint stability for the prosthetic arch, enabling rehabilitation with immediate load. The Vanderlim Transnasal Implant Technique was proposed by dentist Dr. Vanderlim Branco Camargo in 2016. The procedure is an alternative to Quad Zygoma in cases where the patient's bone structure is too small to accept two bilateral zygomatic implants, which can generate surgical risks and uncertainty regarding the results. This adverse situation can be detected by the dentist during surgical planning in software, prototypes, or even during surgery.

Factors such as high difficulty, surgical risks, and real possibilities of post-surgical complications are variables that, individually or together, lead to the decision to abandon the original plan (Quad Zygoma), encouraging the search for surgical alternatives that guarantee the patient's oral rehabilitation. In this scenario, the option for two zygomatic implants (in the posterior region) and two transnasal implants (in the anterior region) emerges as a less invasive surgical possibility. The Vanderlim transnasal implant technique, in addition to providing conceptual simplicity, has lower associated risks. The Vanderlim Technique ensures continuity in the patient's oral rehabilitation planning with the use of a fixed prosthetic arch (protocol) in immediate loading, providing quality anchorage in the anterior maxillary zone, delivering prosthetic stability, and comfort to the patient [12].

Figure 1) below shows a radiographic image exam (panoramic radiograph) where two transnasal implants (Vanderlim Technique) are found in the patient's upper arch in association with two zygomatic implants, presenting itself as a variant of the hybrid All-on-4.

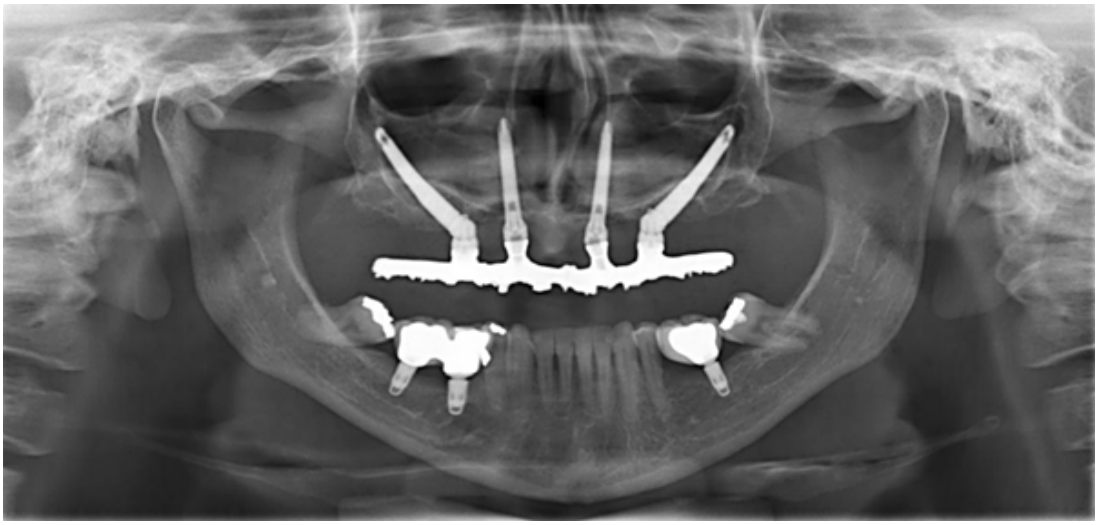

Figure 1: Transnasal implants in the anterior maxillary region and zygomatic implants in the posterior region. Kindly provided by Camargo et al. (2018).

From a surgical point of view, in the Vanderlim Technique, the implant enters the bone structure of the maxilla in the anterior region (canine, lateral, or incisor), touching the nasal cavity, resting on the lateral bone wall, and anchoring apically in the maxillary conchal crest. However, for the procedure to be performed, a bone volume of at least 3 mm is required in the maxillary conchal crest and a minimum bone height of 3 mm between the maxillary ridge and the nasal cavities. Procedurally, the surgeon should make two incisions distal to the first molars, with a slight palatal direction, one incision in the midline and one incision in the alveolar crest, totalling four incisions. The flap is raised to the palatal and buccal aspects up to the piriform aperture so that the nasal cavity, orbital foramen, and zygomatic bone are visible. The distal portion of the nasal mucosa should be carefully released, exposing the lateral wall and floor of the nasal cavity.

The implant installation process should follow the same procedure as for all surgeries, gradually alternating the burs until the thickness indicated by the supplier is achieved. After the installation of the transnasal implants, it is recommended to use a bone graft in particles in two locations: on the lateral wall and on the floor of the nasal cavity. This additional grafting procedure serves to cover the appearance of the implant spirals, which could lead to an increased risk of infection and resulting difficulties, and may affect the patient's breathing. In order to better guide procedures and reduce associated risks, a classification for the installation of transnasal implants-the Vanderlim Technique-was created: the N.A.S.A. classification (an acronym for Nasal Anatomic Systematic Approach) [13]. By using this classification to better conduct the surgical procedure, the surgeon must consider factors such as bone anatomy, the patient's remaining bone quality, and the type of implant to be used.

Figure 2 below shows the NASA classification and its scales from 0 to 4, illustrating the exact location of the implant in relation to the patient's bone structure. The height of the alveolar ridge, the shape of the nasal cavity, and the availability of bone tissue for anchoring the implant in the frontal process of the maxilla must be evaluated to indicate the best technique. In NASA classification 0, the implant emerges on the crest in the foramen region. In NASA 1, the implant is in the region of the central incisor. In NASA 2, on the crest of the lateral incisor. In NASA 3, on the crest of the canine, and in NASA 4, on the crest of the canine with exposed turns. The NASA classification provides greater security for decision-making regarding the best positioning of the implant. From the point of view of prosthetic results, the Vanderlim Technique distributes the load evenly between two transnasal implants in the anterior region and two other posterior implants (zygomatic), which may occasionally vary. The transnasal implants are between 20 and 25 mm and angled at 45º, providing good anchoring torque to, as a whole, safely support the prosthetic arch. Preliminary data on the Vanderlim Technique have been quite encouraging, attesting to its conceptual simplicity, lower associated risk, and prosthetic stability.

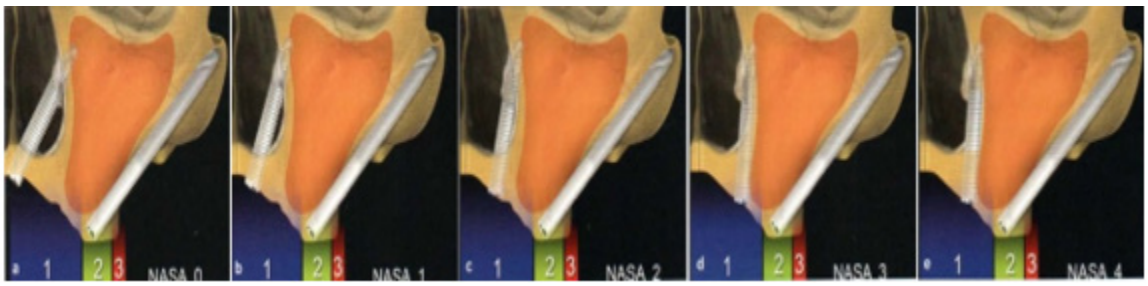

Figure 2: NASA Classification. Kindly provided by Camargo et al. (2018).

Among the main benefits, the Vanderlim Technique alleviates the overload generated by a second implant in the reduced structure of the zygoma (bone collapse), reduces the risk of transposition of the ocular orbit, paraesthesia, sinusitis, soft tissue retraction (exposure of splints), and equalizes the distribution of the load on the prosthetic arch, minimizing the cantilever. It is, therefore, a viable surgical alternative for adverse conditions where the zygomatic bone structure is insufficient to support the Quad Zygoma. As previously reported, the Vanderlim Technique emerged in mid-2016, the same year that the copyright registration process and its scientific dissemination began. Since then, the Vanderlim Transnasal Implant Technique has been propagated and used by a growing number of dentists around the world, providing oral rehabilitation for a significant portion of patients. Professor Vanderlim Branco Camargo has a postgraduate degree in implantology and has been teaching courses, training, and lectures in the area of implantology for over 30 years. He has a private clinic and provides regular consultations at the Ciipo Clinic, located in Florianópolis, Brazil.

Materials and Methods

Procedurally, clinical follow-up data were collected over 9 (nine) years in 100 (one hundred) patients who underwent the Vanderlim Transnasal Implant Technique. Patients aged between 30 and 83 years old who sought oral rehabilitation with immediate loading (fixed prosthesis). In common, these patients presented severe

atrophy of the bone tissue of the upper arch (maxilla) associated with small zygomatic bones, making the Quad Zygoma protocol unfeasible. All patients in this study were assisted and monitored by the same intervention team at the Ciipo Clinic facilities, located in Florianópolis, under the direct technical supervision of Dr. Vanderlim Branco Camargo. The postoperative follow-up time in this study ranged from 2 to 108 months, with an average time of 37.9 months, with scheduled return visits at 1, 3, and 6 months, followed by a regular follow-up protocol (for cleaning and control) every 6 months. Scientifically, this article is classified as applied research of the descriptive type in the area of dental implantology, belonging to the health sciences. Regarding the methodological procedure, it is classified as an observational case study of the retrospective longitudinal type, involving data extracted from the clinical follow-up of post-surgical patients. The data were selected, plotted, and subjected to statistical analysis. The final results of the study were evaluated by the qualitative-quantitative method.

Results and Discussion

Clinical monitoring was carried out on 100 (one hundred) patients undergoing oral rehabilitation who underwent the immediate loading protocol with installation of transnasal implants (Vanderlim Technique). It is important to emphasize that this alternative procedure was adopted due to the incipient anatomy of the zygomatic bones of these patients, which made it impossible to safely perform the Quad Zygoma protocol and, therefore, would make oral rehabilitation with immediate loading unfeasible. According to the data above, the patients were mostly female (69%), with a mean age of 63.1 years, and had been using removable prostheses for an average of 18.4 years. The percentage of totally edentulous patients in this study was 75%, and habitual smokers (smokers) was 11%. The mean period of postoperative clinical follow-up of these patients was 37.9 months (Table 1).

Table 1: Presents the general data of the population studied.

Total population	100 patients
Sampling	100 patients
Average study follow-up	37.9 months
Gender	Female (69%)
Average age of patients	63.1 years old
Average time of use of the previous removable prosthetic solution	18.4 years old
Fully edentulous	75%
Smoker (declared)	11%

General data of the population studied, including sampling, average follow-up, gender, average age of patients, average time of use of the previous prosthetic solution (removable), rate of edentulism, and smoke status. As shown, a significant portion of patients reported being hypertensive. Diabetes, hypothyroidism, high cholesterol, and anxiety were evidenced to a lesser extent, in decreasing order. With advancing age, it is common for some opportunistic diseases to appear. It is important to ask the patient to keep their medication up to date and comorbidities under control, especially in the days before and after the surgical procedure. For this analysis, it is important to emphasize that all patients had previous severe bone loss in the maxillary region and insufficient zygomatic structure to anchor two (or more) implants on each side. Many of them had already undergone other surgical procedures with unsatisfactory results, seeking a solution that would provide rehabilitation of mastication, safety, and aesthetics.

Table 2 presents the patients' health data prior to the procedure for the purposes of general analysis of the condition and documentation. Thus, according to Table 3, of the total number of patients evaluated in this study, 51% underwent the procedure with transnasal implants associated with zygomatic implants. Another 43% underwent hybrid procedures with transnasal implants, zygomatic implants, and pterygoid implants. Another 6% underwent surgery to install transnasal implants associated with pterygoid implants. The variation in surgical procedures and implant placement occurs due to the remaining mandibular bone structure, always seeking the best surgical alternative, weighing factors such as prosthetic stability, patient comfort, and associated risks.

Table 2: Patient's health data and declared comorbidities.

Declared Comorbidity	Percentage
Hypertension	27%
Diabetes/Pre-diabetes	16%
Hypothyroidism	12%
High cholesterol	11%
Anxiety	5%

Table 3 below presents the surgical techniques adopted for rehabilitation with immediate loading, showing the predominance of implants used. According to Table 4, of the total of 100 patients evaluated, bone loss was observed in two patients, in the regions of teeth 13 and 15. One patient reported feeling pain in the region of tooth 15 even 30 days after surgery. Regarding difficulty chewing and cleaning, taken after 30 days, no patient reported having this difficulty. Regarding loose or lost implants, after 1 year, there were no cases. All 100 patients obtained sufficient anchorage and continued to support the immediate load without complications. The results, in general, are very positive and quite favorable to the immediate loading procedure with the use of transnasal implants (Vanderlim Technique). Patients claimed that, if they could have (or had knowledge), they would have opted for fixed immediate loading prostheses earlier. The patients evaluated also stated that they would recommend the immediate loading procedure to acquaintances if they were asked about it.

Table 3: Surgical solutions adopted in 100 patients evaluated.

Surgical solution	No. of cases	Percentage
Transnasal + Zygomatic Implants	51 cases	51%
Transnasal + Zygomatic + Pterygoid Implants	43 cases	43%
Transnasal Implants + Pterygoid	6 cases	6%

Issues such as comfort when chewing, improvement in aesthetics (smile), improvement in mood (sociability), improvement in diction (phonetics), and improvement in self-esteem (self-love) were also declared by all patients, attesting to the benefits of Transnasal Implants-Vanderlim Technique as a safe alternative to Quad Zygoma in cases of patients with severe maxillary atrophy. Tables 4&5 below, presents data obtained from patients over the months of post-surgical monitoring, seeking to evaluate clinical aspects, radiological images, and adaptation.

Table 4: Variables considered for post-surgical follow-up.

Pathology	Cases	Location
Bone loss	2	#13 and #15 sites
Pain and/or inflammation at the surgical site after 1 Month	1	#15 sites
Difficulties chewing after 1 month	0	-
Difficulties in cleaning after 1 month	0	-
Loose or lost implants after 1 year	0	-

Table 5: Patient's statements during follow-up/maintenance.

Improved chewing/chewing safety	100 patients (100%)
Improved aesthetics/smile	100 patients (100%)
Improved mood/sociability	100 patients (100%)
Improved diction/phonetics	100 patients (100%)
Improved self-esteem/self-love	100 patients (100%)
If you could have had knowledge, would you have done it sooner?	100 patients (100%)
If asked/provoked, would you recommend it to someone you know	100 patients (100%)

Conclusion

Immediate loading protocols of the All-on-4 type have revolutionized implantology by providing a solution for oral rehabilitation without bone grafts, using inclined implants and fixed prostheses. After the surgical procedure, the patient uses a temporary prosthesis and, in two or three days, receives the definitive solution. Surgical procedures associated with immediate loading are proven to be faster, safer, and more economical, promoting gains in aesthetics, self-esteem, comfort, chewing, hygiene, and oral health. However, from a professional point of view, when planning the surgical procedure to be adopted for immediate loading procedures, the dentist must carefully observe the bone anatomy of each patient individually, looking for safer places to anchor the implants. Each patient is unique, and, in this sense, rigorous surgical planning is essential for the safety of the procedure and for the success of the patient's oral rehabilitation.

Although the option for zygomatic implants is quite common and has effective results, not all patients with severe maxillary atrophy have a zygomatic structure suitable for Quad Zygoma procedures. In these cases, it will be necessary to rethink the surgical planning, observing the remaining bone structures and seeking alternative and safer anchoring options. Thus, to avoid overloading the zygomatic bone, the Vanderlim Transnasal Implant Technique is a very safe surgical option. In addition to being conceptually simpler, the Vanderlim Technique involves less associated risk and offers quality anchorage in the anterior maxillary zone, providing a smaller cantilever and the stability necessary to support the prosthetic set (protocol) of 12 (or 14) elements. As verified in this post-surgical clinical follow-up of 100 patients who received transnasal implants-the Vanderlim technique-the numerical data were favorable, and the patients reported extreme satisfaction with the surgical procedure adopted. The results presented in this study attest to the conceptual simplicity, the efficacy of the procedure, and the safety of the Vanderlim Transnasal Implant Technique, attesting to its indication as a surgical alternative to the Quad Zygoma procedure.

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None.

Conflict of Interest

No conflict of interest.

Reference

1. Migliorança RM, Irschlinger AL, Penarrocha M, Fabris RR, Javier Aizcorbe-Vicente, et al. (2019) History of zygomatic implants: a systematic review and meta-analysis. DOMR 5(2): 1-9.
2. Maló P, Rangert B, Nobre M (2005) All-on-4 immediate-function concept with Brånemark System implants for completely edentulous maxillae: a 1-year retrospective clinical study. Clin Implant Dent Relat Res (Suppl1): S88-S94.
3. Maló P, Nobre Mde A, Lopes I (2008) A new approach to rehabilitate the severely atrophic maxilla using extramaxillary anchored implants in immediate function: a pilot study. J Prosthett 100(5): 354-366.
4. Maló P, De Araújo Nobre M, Lopes A, Ferro A, et al. (2015) Extramaxillary surgical technique: clinical outcome of 352 patients rehabilitated with 747 zygomatic implants with a follow-up between 6 months and 7 years. Clin Implant Dent Relat Res 17(Suppl 1): e153-e162.
5. STRAUMANN. Basic Information. Zygomatic implant systems.
6. Aparicio C (2011) A proposed classification for zygomatic implant patients based on the zygoma anatomy guided approach (ZAGA): a cross-sectional survey. Eur J Oral Implantol 4(3): 269-275.
7. Bedrossian E, Brånemark PI (2012) Systematic treatment planning protocol for patients with maxillofacial defects: avoiding living a life of seclusion and depression. Atlas Oral Maxillofac Surg Clin North Am 20(1): 135-158.
8. Camargo VB, Baptista D, Grossi JRA (202) 1Transnasal implants: Vanderlim technique as an alternative to the Zygoma Quad technique in atrophic total maxillae: series of 12 cases in immediate loading and follow-up of 2 to 26 months. Implant News 6(5): 674-683.
9. Camargo VB, Baptista D, Manfro R (2019) Transnasal implant (Vanderlim technique) as an alternative to the second zygomatic implant. Coppedê A, (Eds.,). Clinical solutions for total rehabilitations on implants without bone grafts. São Paulo: Quintessence PP. 198-214.
10. Camargo VB, Grossi JRA (2023) Transnasal implants as anterior anchorage abutment in atrophic total maxillae and anatomical classification. Rev Sul-Brasileira de Implantodontia & HOF 21(20): 74-77.
11. Trokhalin A, Camargo V, Bulgakova A, Uchadze G (2024) Full arch rehabilitation of patients with severe atrophy of the upper jaw using the transnasal technique of implant placement. Clinical Dentistry 27(2): 112-120.
12. Camargo VB, Grossi JRA, Andretti FL, Meurer E (2020) Transnasal Implant Protocol.
13. Grossi JRA, Perussolo L, Meurer E, Dalmolin C, Andretti F, et al. (2023) Digital planning and printed metal guides for orientation and installation of zygomatic implants. Napoleão Quintessence, Nova Odessa, SP, Brazil PP. 210-226.