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CHIRURGIE ORALE

par

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Retrospective analysis of 217 Zygomatic implants in 73 patients with total Maxillary Prosthetic Rehabilitation treated between 2011 and 2020

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Table des matières

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Abbréviations

ZI : zygomatic implant

CI : conventional implant

OPT: Orthopantomogram

CBCT: Cone Beam Computed Tomography

L-K: Lanza and Kennedy survey

L-M: Lund-Mackay system

CSR: cumulative survival rate

Abstract

Background: Zygomatic Implant (ZI) is a reliable technique for the rehabilitation of edentulous maxilla. However, the evaluation criteria are not unanimous.

Purpose: This retrospective study analysed ZI in patients treated for maxilla atrophy or after failure of reconstruction. The aim of the study was to evaluate the success and the complication rate associated with ZI using the ORIS criteria.

Materials and method: The implants were placed using quad (4 ZI) or hybrid (ZI and conventional implants (Cis) in premaxilla) surgical techniques followed by immediate loading in edentulous patients. Clinical and radiographic evaluations were carried out at 1-year at least after implantation. This evaluation focused on implant survival, prosthetic offset, clinical and radiological signs of sinusitis, peri-implant soft tissues health and implant stability, thanks to ORIS criteria.

Results: A total of 73 patients, with 217 zygoma implants, were included in the study. The cumulative survival rate was 98.16%. There were four implant failures in three patients. One ZI fracture and two implant mobilities were noticed. Other complications included 21 sinusitis, 28 peri-implant inflammatory or infectious reactions and 6 implant stability loss. There were no drop-outs and the median follow up of the patients was 41,6 months (with a range of 12-118,2 months).

Conclusion: ZI surgery is an efficient procedure, with a low rate of complications and no severe injury compared to other treatment options in extreme upper jaw bone atrophy.

Keywords

Zygomatic implant, maxillary atrophy, oral rehabilitation, retrospective study, complications

Introduction

Various techniques have been described to treat the edentulous atrophic maxilla, including the use of grafting of the maxillary sinus floor, angled implants in the parasinus region, implants in pterygoid apophysis, short, wide implants and zygomatic implants (ZI) (1). For many authors, grafting procedure continues to be the 'gold standard', as well as autogenous bone the best grafting material (2). In addition to the risks and complications of the grafting procedure itself, it also involves a donor site with associated surgical morbidity, a two-stage procedure, a long time treatment and extra costs (3). The minimal bone height in the posterior region of the maxilla is estimated to be at least 10 mm to ensure acceptable success rate for standard dental implants with no need for bone augmentation procedures (4).

The zygoma anchorage concept for severe atrophy of the maxilla was developed by Brånemark in the 1980s. It concerned patients who had undergone a maxillectomy, as well as patients with edentulous upper jaws and mild to severe maxillary atrophy or after failure of graft (4). The ZI is a mean to establish a posterior support in patients with a lack of alveolar bone in zones 2 and 3, according to the Bedrossian classification (6) by using a more distal bone site. For many authors, ZI is a predictable procedure whether used as the primary implant or as the "Rescue" implant in reconstruction of the atrophic maxilla (5). The zygoma fixture represents a direct response to the acknowledged need for improvement in grafting procedures, particularly for improving stability of fixtures and minimizing the need for further surgery (6). Treatment choice depends on the amount of residual bone, the patient's medical history, and the risks is willing to take considering the available surgical options (9).

According to recent publications, ZI have an average survival rate of over 95%.(10) Therefore, it appears as an ideal, stable and viable option (2). Furthermore, ZI are compatible with an immediate loading, allowing the patient to recover a quick social and professional reinsertion. In addition, an improvement of the comfort and the patient's quality of life was showed (12). The main advantage of ZI are the reduced time of treatment thanks to a single surgical approach (7). Initially, the zygomatic implants were positioned under general anesthetic or intravenous sedation. Now this procedure can also be done under local anesthesia.

The success rate evaluation of ZI differs from conventional implants due to the extreme atrophy of the maxilla. Results and complications of zygomatic implants reported in the literature are inconsistent and lack a standardized systematic review. Moreover, protocols for the rehabilitation of the atrophic maxilla using zygomatic implants have been in continuous evolution. That's the reason why Aparicio et al. recently released a success score in order to standardize the ZI evaluation called ORIS (13).

Through a retrospective, observational study we aimed to evaluate the success and complication rate of ZI surgery. Outcomes were collected from patients operated in a single private center by two surgeons between 2011 and 2020 with a minimum follow-up of 12 months. We focused on the success and complication rates using the ORIS criteria. In addition, we looked for the factors influencing this success rate through the particularity of each patient and the surgical technique.

Materials and methods

1. Study Design and Setting

This longitudinal retrospective study included all the patients operated from May 2011 to December 2020 and undergoing upper jaw rehabilitation using Branemark and Nobel Zygomatic (Zurich, Switzerland) Systems. The data were collected from the medical files and during a follow-up consultation, reviewed, and imported into a zygomatic implant database in Microsoft Excel. Information fields and categories were standardized across the database.
Due to the retrospective nature of this study, it was granted in written an exception of ethics committee from the Nantes University Hospital, as per French legislation article L. 1121-1 paragraph 1 and R1121-2 of the Public Health Code.

All patients provided the need for fixed prosthetic full-arch maxillary rehabilitations supported by immediate function implants due to edentulism or the presence of teeth in very poor periodontal conditions.

2. Patient Preparation

The medical history of each patient was reviewed and smoking habits have been requested. After clinical examination, the maxilla and zygoma region of each patient was evaluated radiographically with orthopantomograms and cone beam computed tomography. The surgical site preparation and implant placement procedure used depended on several factors, including the desired emergence profile of the implant, the number of implants being placed, patient anatomy, and the type of prosthesis to be used.

All these implants were placed according to the anatomy of the maxillary sinus and zygomatic bone and/or quantity and quality of the bone. The surgical planning used digital treatment-planning software (NobelClinician then DTX Implant Studio, Nobel Biocare, Zurich, Switzerland).

All patients underwent surgical implant placement and immediate prosthesis delivery performed by two oral and maxillofacial surgeons with long term experience in full arch rehabilitations and immediate loading procedures.

3. Surgical Protocol

The surgical procedures were performed under general or local anesthesia. It was either Quad zygoma or hybrid technique. When necessary, dental extractions were performed at the same time.

In brief, a full-thickness palatal-crestal incision was made on the alveolar ridge from one tuberosity to the other. It was important to visualize several anatomic structures to lead the surgery: the piriform apertures up, the infraorbital foramen, the malar bone and the palate adjacent to the incision.

An oblique osteotomy was made in the lateral wall of the maxilla adjacent to the sinus, according to the technique of Stella and Warner (14), by making a slot along the zygomatic process or according to the technique of Professor Brånemark modified by Dr Chow (15). Thanks to these two approaches, the Schneiderian membrane was dissected off the lateral wall of the sinus and the internal cortex of the zygomatic bone and protected during the following steps of the surgery.

The anterior implants were placed from lateral incisor region and then the posteriors in the first molar region. In preparing the osteotomy sites, the clinician beared in mind the desire for immediate loading (as per the prosthetic plan) and ensure appropriate anchorage for this.

ZIs, machined titanium surface then in 2017 Nobel Zygoma 45° (Nobel Biocare, Zurich, Switzerland) in lengths from 30 to 52,5 mm long were used and had external connection. The implants were placed with a minimum insertion torque of 40 Ncm, after which insertion was completed manually.

Since 2015, the surgical sites were covered with Bichat fat pad. After implant insertion, abutments (zygoma Multi-Unit Abutment, Nobel Biocare AB) were placed (multi-unit or angulated as required) to support the prosthetic rehabilitation. Cover screw were placed over multi-unit abutments during the sutures The flap was coapted ensuring an excellent collar of keratinized tissue around the implants. The sutures were then made with absorbable suture according to the desired technique.

4. Prosthetic protocol

At the end of each surgery, healing caps were replaced by temporary abutment used as transfers. After the suturing step, the impression was made with a resin, by addition to the injector gun, on the transfers of suitable implants.

All implants underwent immediate loading. The intended final abutment was inserted on the day of surgery and a provisional acrylic-resin crown/fixed complete prosthesis was connected (screw-retained). The occlusion was examined carefully and the surgeon realized a control the day after the surgery. Radiological control by Orthopantomogram and Cone Beam Computed Tomography was carried out immediately after the operation to ensure the correct positioning of the zygomatic implants and absence of immediate complications. A tender diet was recommended throughout the osseointegration period. Patients were instructed to rinse with chlorhexidine mouthwash twice daily and with warm saltwater 4 to 5 times daily. Broad-spectrum antibiotics were prescribed postoperatively for all patients for 7 days.

5. Follow up visits and maintenance protocol

Three appointments were set after the surgery. The first took place ten days after the operation to check for good healing of the soft tissues, to deposit the sutures and check the occlusion. At one month, a second appointment took place which allowed the provisional prosthesis to be evaluated, the occlusion to be checked and it to be adjusted if necessary. Finally, the change of the provisional prosthesis by the definitive fixed prosthesis was carried out after four to six months, after osteointegration control. During this consultation, the transient prosthesis was removed and periradicular radiographs were collected using film holders. Oral hygiene and occlusion were checked and the implant tested. The practitioner checked the condition of the soft tissues, the depth of the pockets and the absence of bleeding on probing. A two- and three-dimensional radiographic examination was also performed to verify the absence of sinus complications and peri-implantitis. The bridge was finally reassembled. The follow up consultation was performed by a single practitioner.

6. Clinical endpoints = ORIS criteria

Implant survival rates were evaluated based on the clinical and radiologic criteria as a primary outcome. Complications were evaluated as additional criteria.

This Zygomatic Success Code (Revisited) created by Aparicio in 2020 propose a score to evaluate the zygomatic implants to uniformise the valuation of each clinician in order to compare in a more reproductive way the studies on ZI and their results. It takes into consideration the description of specific criteria (divided in O : prosthetic offset (mm), R : rhinosinus associated pathology, I : Peri-implant soft tissue condition and S : Stability (individually tested))and classifying zygoma implants as successful (grades I, II, or II) or failed (grade V). (13)

Criterion O specifies the success of prostheses anchored on ZI. Anatomical measurements are performed to assess the position of the implant head relative to the midpoint of the alveolar bridge crest (figure 1).

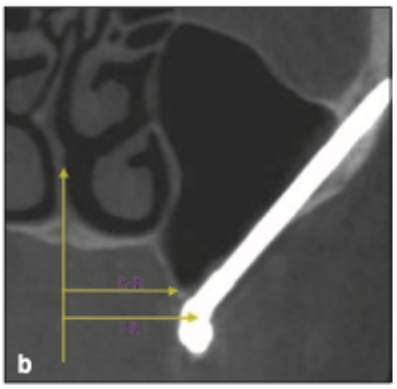


Figure 1 The measurements to define the prosthesis offset relate the center of the residual crest to the position of the zygomatic implant head. The distance from the palate middle line to the center of the residual right crest (C-R) minus the distance from the palate middle line to the center of the right implant head (I-R) was –1 mm, indicating the magnitude of the offset (success grade I for the offset criteria). The buccal position of this implant gives a negative result of –1 mm. (13)

Criterion R assessed the sinus health according to the Lanza and Kennedy (L-K) survey (16) (clinical evaluation) and the Lund-Mackay (L-M) system (17) (radiologic test, evaluated as negative when non increased opacity is observed between the postsurgical L-M score and the presurgical L-M score (CBCT)).

Criterion I assessed peri implant soft tissue condition, performed attending to visual manifestation of recession and/or gingival inflammation (detecting on swelling, redness, or bleeding when slightly impressed), probing must be avoided.

Criterion S assessed stability, in applying non axial forces to an externally positioned ZI, mobility, pain or rotation are checked.

Implant failure was defined as complications of the implant-prosthetic complex, persistent or recurrent rhinosinusitis refractory to treatment, recession associated to permanent or recurrent signs of soft tissue inflammation or infection refractor to treatment or no esthetic acceptance, clear mobility, rotation or/and pain resulting in the removal of the implant.
Each patient was reviewed at the longest follow-up and all data was collected and listed in a spreadsheet to be then analyzed.

7. Statistical analysis

The analyses were performed in R version 3.6.1 (R Core Team, New Zealand). The qualitative variables are represented as count and percentage. Fisher test was selected to compare two qualitative variables because of the low number of labels in several variables.
Multivariate logistic regressions were performed to explore predictive variables influencing the success rate. The patient criteria were: age at the surgery, gender, smoking habits, intraoperative extractions and surgical criteria were: implant type, surgical technique and fat pad.
To select the variables in the multivariable regression logistic, a forward stepwise method with the bayesian information criterion was used.
Kaplan-Meier curves were built to realize survival analysis. The log-rank test was used to compare survival curves. The library survival contains tools to performed the analysis. The main unit is the zygoma implant. A 5% statistical significance threshold was used for all analyzes.

Results

The present study included 73 consecutively treated patients (Table 1) (43 females (58,90%) and 30 males (41,10%)) with a total of 217 ZIs and 76 CIs. The study population was composed of patients aged from 34 to 82 (mean 63,26 years) who had at least one ZI placed between January 2011 and December 2020. All patients received a temporary prosthesis with immediate loading and esthetics on the same day of surgery.

The surgery was performed in 60 patients (82,2%) under general anesthesia and in 13 patients (13,8%) under local anesthesia. 76 implants were placed using the Chow technique, 136 implants using the Sinus Slot technique and only 2 patients benefited from the intrasinus technique (5 ZIs).

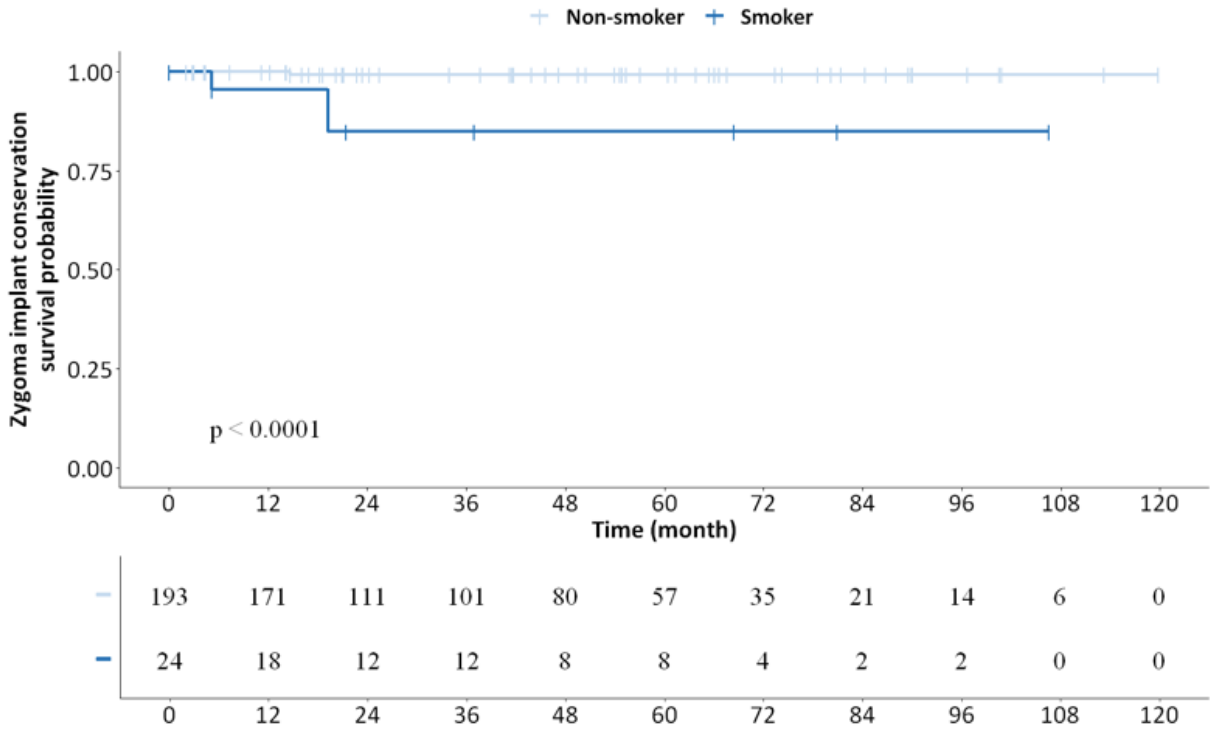
1. Medical background

41 (56,2%) patients presented some systemic conditions among 1 had a cleft, 1 an ectodermal dysplasia, 0 oncologic condition. The systemic conditions of all patients were under control, so they were not accepted as major obstacles to perform surgical operations. Eleven patients had antiaggregant or anticoagulant, one had bisphosphonates, no immunosupressant. 4 patients were bruxers and one of these patients lost an implant due to this condition. 8 patients were current smokers (10.96%). No patient had acute or recurrent sinusitis prior to implant placement.

2. Implant survival rate

In this study, there were no drop out and the implant survival rate was 98,16% after prosthetic loading in a mean of 41,60 months of follow-up (12 up to 118,2), considering failures as the need for implant removal, before or after loading. Data and results for comparison of smoking status and survival rate are presented in Figure 2.

Figure 2 IZ survival curve



Four ZIs in three different patients during the visit to control the osteointegration were lost.

Detailed data and results concerning age, gender, smoking status, implant details, reason of failure and current situation are listed in Table 1.

Table 1 Details on implant failures

Time	Age at surgery (y)	Sex	Smoking status	Implant details	Current situation
4 months Z.	67	H	Nonsmoker	1 Posterior, 45°	Conventional implant in site of 26 following a bone graft
5 months R.	47	F	Smoker	1 Posterior, 45°	Temporary prosthesis
12 months M.	49	F	Smoker	1 Posterior, 45°	Complete removable prosthesis
12 mouths M.	49	F	Smoker	1 Posterior, 45°	Complete removable prosthesis

3. Surgical data :

A total of 217 zygomatic implants of varying lengths were placed. Among them are:

- 95 implants Branemark System Ti Unite
- 122 implants Nobel Zygoma 45°

The oral rehabilitation of these patients was divided between "Quad Zygo" (n = 36) and hybrid restorations (n = 37). 75 ZI (34,6%) are in anterior location and 58 patients (79,5%) have definitive prothesis.

For hybrid restorations, 76 conventional implants, with a length of 8-18 mm and a diameter of 3.3-4.1mm, were anchored in the residual jawbone in combination with one to three zygomatic implants.

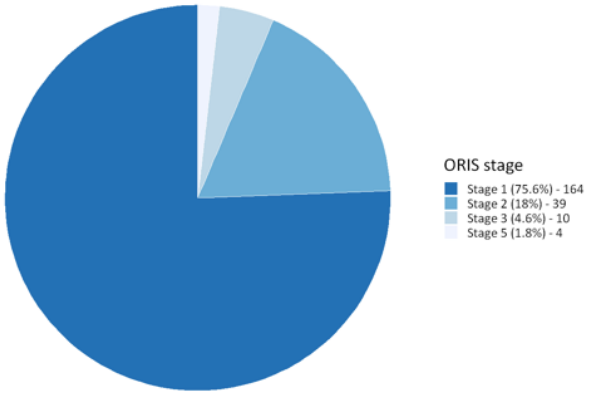
The opposing mandibular occlusal surfaces consisted of removable prostheses, natural teeth, implant-supported fixed prostheses, or a mixture of implant-supported and fixed prostheses over natural teeth.

76 ZI benefited from the technique modified by Dr Chow, 186 from the Bichat fat pad and 73 from intraoperative extractions.

4. Complications

According to the ORIS criteria, complications (Figure 3) were observed in 34 patients and 55 ZI. One hundred and sixty-four implants were classified in stage 1, 39 implants in stage 2, 10 implants in stage 3, 0 implant in stage 4 and 4 implants in stage 5.

Figure 3 Repartition of stage thanks to ORIS criteria



A data.frame: 5 × 4

	Score O	Score R	Score I	Score S
	<int>	<int>	<int>	<int>
1	217	192	185	210
2	0	19	29	2
3	0	6	3	1
4	0	0	0	0
5	0	0	0	4

No prosthesic offset was raised (O). The final prosthesis broke in 6 patients (8.22%) with no history of bruxism prior the rehabilitation.

There were 25 maxillary sinus reactions (R), clinically and radiologically (11.52%). Three patients (4,11%) underwent a meatotomy why no further symptoms after the surgery. Dental impression material was found in 1 patient.

Peri-implant pathology or infectious reactions was observed in 32 implants (14.75%) (I), including 23 recessions (10.60%), 11 bleedings (5.07%), 2 mucositis (0.92%) and 4 oro antral communications (1,84%).

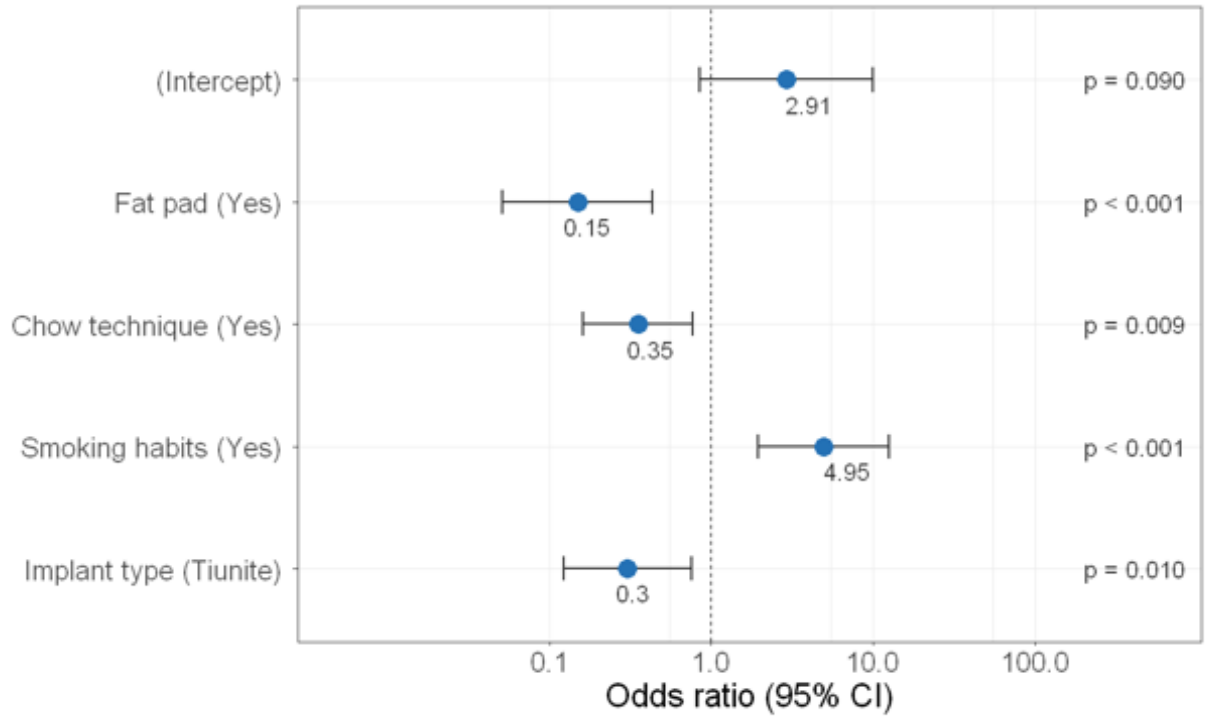
2 implants (0,92%) were mobile, 1 (0,46%) implant was palpable subcutaneously in the cheek under the malar bone and 1 implant (0,46%) bring about partial paresthesia (S). Seven implants (3.23%) stability defect during the test. In addition, 1 fracture (0,46%) of the zygomatic bone was caused during the surgery.

The complications listed above were resolved with no acute symptomatology or other associated sequelae.

Our results do not report any integration failure and no osteitis after one year.

5. Statistics

Figure 4 Implant success rate for comparison of fat pad, slot technique, smoking habits and implant type



Statistically significant associations were found between fat pad, Chow technique, smoking habits implant type and ZI survival rate (All P>.05). The implant survival rate was not influenced by gender (p=0,71), age (p=0,15), or concomitant extractions (p=0,99).

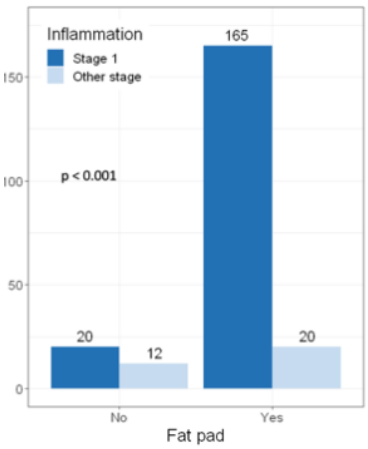


Figure 5 Statistic association between Bichat fat pad and criteria I (recession, signs of inflammation or infection) according to ORIS criteria.

Discussion

The aim of this retrospective study was to evaluate the global survival rate of the ZIs. In our analysis, only 4 zygomatic implants failed in 73 patients with a total 217 implants placed in immediate function for the rehabilitation of the completely edentulous and severely atrophic maxilla showed a Cumulative Survival Rate of 98.16%. All patients had immediate loading, in correlation with recent papers which suggest that immediately loading zygomatic implants were associated with statically significantly fewer prosthetic failures, implants failures and time needed to functional loading when compared to augmentation procedures and conventionally loaded dental implants. (18). Generally, failure occurred during the first year interval and is not related to the number of ZIs. (19) In our study, they occurred prematurely (4, 5 and 12th months), before the osteointegration.

According to a literature review by Migliorança et al. showed a CSR of over 95%, whether with the intrasinus technique or the extrasinus technique (10). Several authors have calculated a high cumulative survival rate to evaluate the longevity of ZI. Several studies have reported a high CSR, making atrophic maxillary rehabilitation with zygomatic implants a predictable procedure and safe approach. (20) (21) (22) ZIs had shown better clinical results compared with bone grafting procedures representing a possible new "gold standard" for atrophic jaw treatment. (23)

Some authors exclude patients who smoke more than 10 cigarettes per day. (18) In our study, 3 out of 4 implant failures occurred in 2 smokers. Smoking has a significant effect on the failures and complications and must be considered as a critical risk factor, as we could see on the ZI survival curve (fig 2).

In this study, no statistic difference was found between age and implant survival contrary to the opinion of the authors. (15)(25) They explain this association by the better hygiene achieved by patients over 60 years old.

The most frequent complications in the literature are sinusitis followed by paresthesia (infraorbital nerve damage) and oroantral communications. (26) In our study, no paresthesia was observed and 4 oroantral communications occurred. Nevertheless, a few cases of serious complications like temporal injuries of the infraorbital nerve (infraorbital nerve paresthesia) and penetration of the orbital cavity while placing ZIs have been reported in the literature. (27) We did not find such complication. ZI surgery by a trained clinician appears to be a safe option with a low rate of minor complication and an absence of severe one.

There are a number of published criteria to evaluate the success of zygomatic implants, but they are not standardized. In order to determine implant success according to different parameters, we use ORIS criteria to obtain reproducible results, as Aparicio suggested. (13)

Another goal was to study the relationships between the surgical techniques, the positioning of zygoma implants and the possible long-term related complications.

In the original P-I Brånemark zygoma protocol (Brånemark System, Sweden), it was proposed to place ZIs using an "intrasinus" approach but the major shortcoming was sinus infections and a greater palatal emergence than natural dentition. Palatally placed ZI heads lead to a bulky prosthesis, causing a mild deterioration in speech. (27)

There was evolution of the surgical technique, with ZI in a more external way in order to avoid crossing the maxillary sinus. The extrasinus placement of ZI could reduce sinus and speech side effects. (28)

First The Sinus Slot Technique Described by Stella and Warner (14) aims to protect the schneiderian membrane and reduce the perforation of the lateral wall of the maxillary sinus, by making a groove along the zygomatic process of the jaw instead of a large window.

Then the technique modified by the Dr Chow, used in 78 implants, also eliminates the risk of maxillary sinusitis related to oro antral communication. (15) Our results are in accordance with Goker et al. (24), that reported extra-maxillary/extrasinus approach in ZI insertion does not cause significant sinusitis, since most part of the implant is placed outside the maxillary sinus. The bone

flap preserves the Schneiderian membrane and promotes bone creation around the implant and better osseointegration. This significant result tends to think that this surgical technique is more efficient. The authors advocate for the use of chow technique. (Figure 4)

In our study, with regards to sino-nasal complications, 25 maxillary sinus reactions were confirmed clinically and radiologically, but few were symptomatic (4 sinusitis). The positioning of zygoma implants was associated with variable degrees of altered sino-nasal homeostasis, although almost always limited to a subclinical level.

According to the results reported in the literature, the incidence of sinusitis associated with zygoma implant placement ranges from 0% to 26.6% (18) (29). Such a wide range is probably due to lack of uniformity in the criteria adopted for the classification of sino-nasal disease. Other difficulties in the analysis of these complications consist in establishing a clear correlation between sinus inflammation and zygoma implants, as many authors did not report the pre-existing clinical and radiological conditions (21). Studies concerning the general population reported symptoms comparable to our sample of patient (30).

The exteriorization presents greater technical facility and greater anchorage, therefore it may result an important periimplant involvement, buccal recessions, difficult control of oral hygiene and extensive bone destruction. (22) This could explain the number of 23 recessions (10,60%) in our study.

Malo et al. performed an analysis in 352 patients, rehabilitated using 747 zygoma implants, with a follow-up of 6 month to 7 years: 54 implants (7,23%) reported peri-implant pathology, i.e., increased probing depth (>4 mm) and probing bleeding and/or plaque deposits. The situation was resolved in 43 patients: in 34 cases, with non-surgical treatment with scaling and chlorhexidine washes; in 4 cases, with non-surgical treatment associated with antibiotic therapy; and in 5 patients, with surgery. On the other hand, the problem was not solved in 11 patients (31).

However, these extra sinus techniques has the disadvantage of removing alveolar bone from the implant neck, which negatively influences the biomechanical support of the implant and prosthesis. (32) (33)

The extra maxillary position has as a major consequence the lack of keratinized gingiva on the residual ridge leads to irritation of the mucosa due to the movements of the tissues on the surface of the implants. To help reduce this problem, the Bichat's fat pad can be used to surround the surface of the implant and improve tissue. (3) This technic was systematically used from 2015 to 2020 the fat pad which helps reduce gingival recessions caused by mucositis and peri-implantitis. The significant results regarding the use of the Bichat fat pad to reduce peri implant inflammation is in agreement with the article of Guennal (34) who claims, that suturing the fat pad around implants prevents vestibular gingival recessions and causes rare adverse outcomes included a feeling of vestibular swelling or transient paresis of the facial nerve. To the light of these results, the authors advocates for using fat pad not as an option in secondary intention (35) but systematically in ZI placement to prevent mucositis, peri implant inflammation and recessions.

The limitations of the study include the retrospective design and the involvement of a single center. As this is a study over an extended follow-up period, two different surgeons operated and their surgical methods have improved over the years. There is a learning curve concerning this exigent surgery. They should be able to deal with the possible complications.

In addition, the implant type changed. The Nobel Zygoma 45° was created to be less traumatic for the buccal mucosa compared to Branemark System Zygoma Ti Unite. However, in our study, Ti-Unit implants seemed to have better implant success compared to Nobel Zygoma (p=0.010).

Prospective studies with larger numbers of patients are needed to determine the risk factors associated with zygomatic implant failures. Further investigations with a larger sample size and uniformized criterions such as ORIS score, including also oncology patients and assessing oral health-related quality of life, are desirable and a standardized clinical-radiological assessment.

Conclusion

In this study, zygomatic implants placed over a mean of 41,60 months of follow-up had a high survival rate in managing severely atrophic in accordance with data in the literature. After the osteointegration period, no zygomatic implant failed. Complications were rare and usually easy to manage.

ZIs appear to be a consolidated therapeutic option for significantly atrophic maxilla offering a promising alternative to heavy bone grafting techniques and sinus elevation procedures with fewer complications, shorter time for rehabilitation, less prosthodontic work needed, and significantly higher survival rates. Randomized controlled clinical trials must be conducted to examine their efficacy in comparison with other techniques.

Conflict of interest

The authors declare no potential conflicts of interest with respect to the authorship and/or publication of this article.

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NOM : LEROY PRENOM : Camille

Titre de Thèse: Retrospective analysis of 217 Zygomatic implants in 73 patients with total Maxillary Prosthetic Rehabilitation treated between 2011 and 2020

RESUME

Background: Zygomatic Implant (ZI) is a reliable technique for the rehabilitation of edentulous maxilla. However, the evaluation criteria are not unanimous.

Purpose: This retrospective study analysed ZI in patients treated for maxilla atrophy or after failure of reconstruction. The aim of the study was to evaluate the success and the complication rate associated with ZI using the ORIS criteria.

Materials and method: The implants were placed using quad (4 zygoma implants) or hybrid (zygoma and conventional implants (Cis) in premaxilla) surgical techniques followed by immediate loading in edentulous patients. Clinical and radiographic evaluations were carried out at 1-year at least after implantation. This evaluation focused on implant survival, prosthetic offset, clinical and radiological signs of sinusitis, peri-implant soft tissues health and implant stability, thanks to ORIS criteria.

Results: A total of 73 patients, with 217 zygoma implants, were included in the study. The cumulative survival rate was 98.16%. There were four implant failures in three patients. One ZI fracture and two implant mobilities were noticed. Other complications included 21 sinusitis, 28 peri-implant inflammatory or infectious reactions and 6 implant stability loss. There were no drop-outs and the median follow up of the patients was 41,6 months (with a range of 12-118,2 months).

Conclusion: ZI surgery is an efficient procedure, with a low rate of complications and no severe injury compared to other treatment options in extreme upper jaw bone atrophy.

MOTS-CLES

Zygomatic implant, maxillary atrophy, oral rehabilitation, retrospective study, complications

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Titre de Thèse: Analyse rétrospective de 217 implants zygomatiques chez 73 patients avec une réhabilitation prothétique maxillaire complète traités entre 2011 et 2020

RESUME

Contexte : L'implant zygomatique (IZ) est une option thérapeutique fiable pour la réhabilitation du maxillaire édenté. Cependant, les critères d'évaluation ne sont pas unanimes.

Objectif : Cette étude rétrospective a analysé les IZ chez des patients traités pour atrophie maxillaire ou après échec de reconstruction. Le but de l'étude était d'évaluer le succès et le taux de complications associées aux IZ en utilisant les critères ORIS.

Matériel et méthode : Les implants ont été posés selon des techniques chirurgicales Quad (4 IZ) ou Hybrid (IZ et implants conventionnels (ICs)) suivies d'une mise en charge immédiate chez les patients édentés. Une évaluation clinique et radiographique été réalisée à 1 an au moins après l'implantation. Cette évaluation a porté sur la survie de l'implant, le décalage prothétique, les signes cliniques et radiologiques de sinusite, la santé des tissus mous péri-implantaires et la stabilité de l'implant, grâce aux critères ORIS.

Résultats : Un total de 73 patients, avec 217 implants de zygoma, ont été inclus dans l'étude. Le taux de survie cumulé était de 98,16 %. Il y a eu quatre échecs implantaires chez trois patients. Une fracture du zygoma et deux mobilités implantaires ont été constatées. Les autres complications comprenaient 21 sinusites, 28 réactions inflammatoires ou infectieuses péri-implantaires et 6 défauts de stabilité de l'implant. Il n'y a eu aucun perdu de vue et le suivi médian des patients était de 41,6 mois (avec une fourchette de 12 à 118,2 mois).

Conclusion : La chirurgie utilisant les IZ est une procédure efficace, avec un faible taux de complications et aucune blessure grave par rapport aux autres options de traitement de l'atrophie osseuse extrême du maxillaire.

MOTS-CLES

Implant zygomatique, atrophie maxillaire, réhabilitation orale, étude rétrospective, complications