



# Evaluation of satisfaction of individuals rehabilitated with zygomatic implants as regards anesthetic and sedative procedure: A prospective cohort study



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## HIGHLIGHTS

- Wilcoxon test revealed that the emotional condition of the individuals differed at the beginning and end of treatment.
- General satisfaction with treatment was high.
- From the emotional point of view of the individuals there was emotional improvement thus improving the quality of life.

## ARTICLE INFO

### Article history:

Received 19 April 2017  
Received in revised form  
22 August 2017  
Accepted 23 August 2017

### Keywords:

Atrophic maxilla  
Zygomatic implants  
Patient satisfaction  
General anesthesia  
Sedation

## ABSTRACT

**Purpose:** To evaluate the satisfaction of individuals with atrophic maxilla, rehabilitated with fixed dental prostheses, anchored on zygomatic implants, with variables being the anesthetic procedure: general anesthesia, or local with sedation.

**Materials and Methods:** By means of the clinical record charts from the Training Course in Advanced Hospital Surgeries for Implant Dentists conducted at the Campinas-SP unit of the São Leopoldo Mandic School of Dentistry, 30 individuals were randomly selected. They had zygomatic implant placement surgeries performed, and were rehabilitated with fixed implant supported complete dentures, between the years 2005 and 2011. One group of 15 individuals underwent surgery in hospital, under general anesthesia. The other 15 were treated in the post-graduation clinic at the School of Dentistry, under local anesthesia and sedation.

**Results:** From the emotional point of view, the Wilcoxon test revealed that irrespective of the anesthesia procedure used, at the beginning of treatment, the emotional condition of individuals differed from that verified after conclusion of the treatment ( $p < 0.0001$ ).

**Conclusion:** There was no difference between the two groups as regards the anesthetic procedure. General satisfaction was high; there was emotional improvement after conclusion of the treatment, thus improving the quality of life.

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## 1. Introduction

Rehabilitating individuals with atrophic maxilla has always been and still is a challenging treatment. Dental surgeons are always concerned about the rehabilitation of these individuals, and over the course of several years, new surgical techniques and dental prostheses have been developed. At present there is a large variety

of options for rehabilitating maxillary edentulism. There are patients who wish to have fixed dental prostheses supported by osseointegrated implants. Thus, depending on the degree of superior maxillary atrophy, we may resort to different types of treatments, such as bone grafts, inclined and zygomatic implants.

Frequently, the alveolar ridge resorption is so extensive, that it is not possible to place conventional implants in the posterior region of the maxilla. In these cases, zygomatic implants may be used, either associated with conventional implants in the anterior area, or not [1]. Initially, zygomatic implants were introduced by professor Branemark [2]. The surgical procedure was performed in hospital, under general anesthesia, with nasal intubation. Local

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anesthesia was injected into the maxillary regions and palate. At present, surgery may also be performed in the outpatients' clinic, with local anesthesia [3] and intravenous [3] or oral sedation. When searching the literature, there are innumerable studies showing the success of therapy with zygomatic [4] implants, however, few studies refer to the satisfaction of individuals [5–7].

The purpose of this research was to evaluate the satisfaction of individuals with regard to the surgical procedure, and in this context, observe the benefits of surgery performed under general or local anesthesia with intravenous or oral sedation. Thus broader knowledge about these subjects would be acquired, to know which procedures were most recommended by both professionals and individuals, for use in future treatments.

## 2. Materials and Methods

After approval by the Research Ethics Committee (REC) of the São Leopoldo Mandic Dental School, protocol number 2011/0431, this prospective cohort study was conducted with a sample established by convenience. This was composed of 46 clinical record charts of the Department of Dental Surgery, São Leopoldo Mandic Institute and Dental Research Center, of individuals who underwent zygomatic implant placement surgeries. These patients were rehabilitated with fixed implant supported screw-retained dental prostheses (hybrid type), in the years between 2005 and 2011, in the Training Course in Advanced Hospital Surgeries for Implant Dentists conducted at the Campinas-SP unit of the São Leopoldo Mandic School of Dentistry, at the unit in Campinas-SP, Brazil. Of the 46 clinical record charts selected, only 32 individuals were localized after sending letters, e-mails and making telephone calls. Of these individuals, 17 were submitted to surgery in hospital, under general anesthesia, and are here denominated Group 1. The others (fifteen) had surgeries performed at the dental school, in the post-graduate clinic, with local anesthesia and intravenous or oral sedation (Group 2). During surgical planning, the individuals were presented with three options: general anesthesia (performed in hospital); local anesthesia with intravenous sedation (performed in the dental school outpatient clinic); and local anesthesia with oral sedation (also performed in the dental school outpatient clinic). The decision was subject to the complexity of the surgeries (time) and dental surgeon's experience. Seventeen (17) individuals preferred to have the procedure performed in hospital under general anesthesia, when informed that the estimated time of the surgery would be 4 h. Twelve (12) individuals preferred to have the surgery performed at the dental school with local anesthesia and intravenous sedation, under the supervision of an anesthetist doctor; and only 3 individuals underwent the procedure with local anesthesia and oral sedation, when they were informed that the surgical time would be under 1.5 h, and that the surgery would be performed by highly experienced surgeons.

The 32 individual located were contacted by telephone and/or e-mail, to present to the São Leopoldo Mandic dental school, on an appointed day and time, to undergo clinical evaluation. All the individuals of Group 1 had surgeries performed in hospital under general anesthesia. In this group, local infiltrative anesthesia was also administered to contain bleeding in the trans-operative period. In Group 2, 12 individual were submitted to local anesthesia and intravenous sedation (Diazepam 10 mg/Midazolam 10 mg), monitored by an anesthetist doctor, and three received local anesthesia and orally administered sedation (1 tablet of Midazolam 15/mg, 30 min before surgery). In clinical practice, in a surgical time of under 1.5 h, sedation with Midazolam 15 mg has the same effect as that of intravenous sedation, and this was the reason why these patients were included in Group 2). During evaluation, the patients'

oral health was examined, and data were collected by means of a personalized questionnaire, associated with a 10 cm long visual analog scale (VAS) (Table 1). The VAS 0 indicated complete dissatisfaction, and 10, complete satisfaction. Similar scales have been used in other studies [6]. Explanations or help were offered, when necessary.

All the individuals signed the term of free and informed consent, and went through the following inclusion and exclusion criteria:

### a) Inclusion Criteria:

- Individuals of the male and female gender.
- Minimum age: 35 years;
- Smokers or nonsmokers;
- Who had received at least one zygomatic implant;
- Late loading;
- Immediate loading (initial insertion torque of 35 Ncm); [1]
- Those who received fixed, implant supported, screw-retained dental prostheses (hybrid).

### b) Exclusion Criteria:

- Blind, deaf and/or dumb individuals;
- Those who had some type of mental deficiency;
- Who received implant supported overdenture prostheses;
- Those who failed to respond any question in the questionnaire.

The patients were instructed about their oral health status, especially the peri-implant tissue, and about cleaning and prevention care and techniques. We randomly removed 2 samples from Group 1 to maintain the groups paired to enable us to use tests with a correlation structure, resulting in a sample of 30 individuals, with 15 in Group 1 and 15 in Group 2. By means of clinical record charts and panoramic radiographs, the authors counted that 30 individuals selected received a total of 131 implants, of the company Conexão Sistemas de Prótese, with 64 being of the zygomatic and 67 of the conventional type. Group 1 received 40 zygomatic and 28 conventional implants; and Group 2 received 24 zygomatic and 39 conventional implants.

The data collected were submitted to descriptive and inferential statistical approaches. The confidence interval for the mean was calculated. The non parametric Wilcoxon test was used to compare the participants' emotional condition in the intervals of the beginning and conclusion of the treatment, irrespective of the anesthetic procedure used. The non parametric G test was applied to verify whether there was difference in the individuals' emotional condition in at the beginning of treatment, considering the type of anesthetic procedure adopted. The same test was used to compare whether there was difference in the emotional condition on conclusion of the treatment, according to the anesthetic procedure. The non parametric Mann-Whitney test was used to compare the degree of satisfaction reported by individuals whose surgeries were performed under general and local anesthesia with sedation, considering the different indicators evaluated. The Exact Fisher test was used to analyze whether there was difference with regard to the individuals' expectations about treatment when the surgical procedures were performed under general, or local anesthesia with sedation. The level of significance adopted was ( $P < 0,05$ ), and the statistical calculations were performed in the BioEstat program 5.0.

## 3. Results

The clinical record charts evaluated belonged to 30 individuals, with a follow-up period of 6 years, of whom 11 were men, representing 36.7% of the sample, and 19 women, totaling 63.3% of the sample. As regards age-range, the individuals were between 43 and 72 years of age, with a mean age of 56.5 and standard deviation of

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