

# ENHANCEMENT OF THE QUALITY OF LIFE IN TOTALLY EDENTULOUS PATIENTS BY IMPLANT-SUPPORTED FIXED PROSTHETIC RESTORATIONS USING MODERN GUIDED BONE REGENERATION TECHNIQUES

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**Abstract:** Total edentation has always been considered one of the most mutilating pathological states of the dental-maxillary apparatus as it disturbs all its functions. Thus, regardless of age, the totally edentulous patient is dis-inserted from the social environment, which may be quickly perceived as a true social handicap. Nowadays, due to the progress made in dental therapeutics, total edentation can be restored using not only mobile dentures, but also implant-supported fixed prosthetic restorations, employing modern guided bone regeneration techniques. In this context, we conducted a study on totally edentulous and in the process of becoming totally edentulous patients, to assess the enhancement of their quality of life following the use of oral implantology techniques, modern guided bone regeneration techniques included, the results being presented in the paper.

## INTRODUCTION

As it is well known, total edentation is one of the most mutilating pathological states of the dental-maxillary apparatus, as it affects all its functions. The main causes that lie at the basis of total edentation are the complications of dental caries and marginal periodontitis. However, stress, limited budget due to the difficult economic situation in our country, unhealthy eating habits, fear of pain, accidents and various injuries have lately contributed to total edentation occurring at an early age, compared to the classically admitted age (about 65).(1-5)

Studies have clearly highlighted the fact that the average age of the population in Romania has increased in the past two decades and treatment including dental options have been substantially diversified and improved. However, total edentation frequently affects the structures of the dental-maxillary apparatus, occurring mainly in the patients belonging to the elderly category and, more recently, in the patients under the age of 65. Thus, regardless of age, the totally edentulous patient is dis-inserted from the social environment, which can be quickly perceived as a social handicap.(1-5) Nowadays, considering the progress made in dental therapy, total edentation is not considered a state of normal involution of the dental-maxillary apparatus but a pathological state.(1-5)

Currently, oral implantology and modern guided bone regeneration techniques (bone augmentation and addition) generally provide new means of treatment for total edentation. However, a large number of dentists and a highly significant percentage of patients opt for the classical therapeutic solution, namely total acrylic or metal plate dentures, although these types of prosthetic restorations do not result in a substantial improvement in the quality of life of the subjects.(1-5)

patient who is on the verge of becoming totally edentulous or who is already totally edentulous is mainly related to the mobility and volume of the prosthesis that is to be inserted in the oral cavity.(1-5)

Another disability perceived by the totally edentulous patient is represented by the effort the subject suspects that he/she should make in order to adapt to wearing this type of prosthesis.

However, the mentality according to which complete dentures can mitigate the effects of a major disability, on the one hand, and the fact that the presence of complete dentures is an indication of early aging, on the other hand, are additional reasons for totally edentulous patients in the 21<sup>st</sup> century to be more confident when accepting a treatment entailing fixed prosthesis, which means employing oral implantology achievements and modern bone regeneration techniques (bone augmentation and addition).

Unfortunately, such modern therapeutic methods, although more frequently employed by dentists and accepted by patients, are not only extremely traumatising for patients but also very expensive.

That is why, in this paper, we present the results of a well documented though preliminary study conducted by us, related to the improvement in the quality of life of totally (maxillary, mandible or bi-maxillary) or on the verge of becoming totally edentulous patients by employing oral implantology techniques, namely implant-supported fixed prosthetic restorations, as well as modern guided bone regeneration techniques such as bone augmentation or addition. The study is based on a simple and clear questionnaire administered to the above-mentioned patients.

## PURPOSE

In general, chewing capacity reduction is not the only disability of complete dentures wearers. The major fear of the

## MATERIALS AND METHODS

The method employed to conduct the study was the questionnaire. It comprised 8 questions (8 items), being

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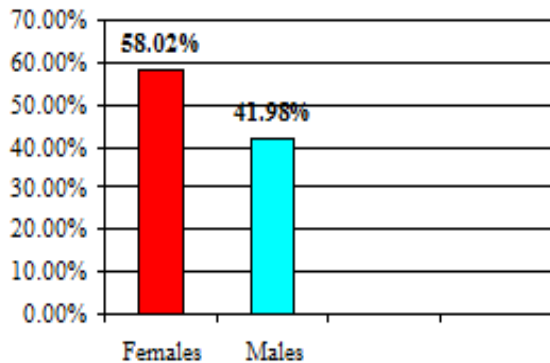
administered to a number of 131 subjects, patients who were totally edentulous or in the process of becoming totally edentulous (maxillary, mandible, bi-maxillary), and who underwent dental treatment (prosthetic restoration) between February and December 2015 in 26 dental offices in Bucharest. Mention should be made that both dentists and patients agreed to answer the questions but wished to remain anonymous.

The patients to whom the questionnaire was administered were both males and females, aged between 40 and 90 years old, edentulous or in the process of becoming edentulous in one arch (maxillary or mandible) as well as totally edentulous or in the process of becoming totally edentulous (bi-maxillary). The statistical analysis resulting from the preliminary study is succinct, being suggestively presented through graphs.

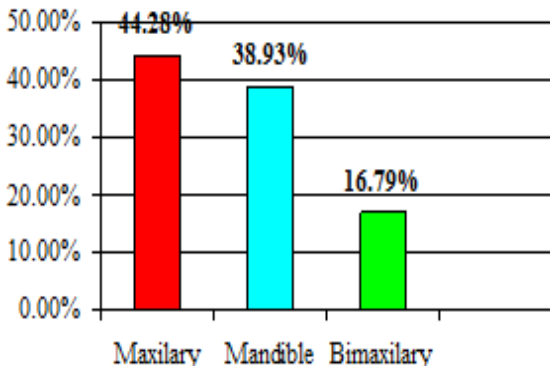
Of the 131 totally edentulous or on the verge of becoming totally edentulous patients to whom the questionnaire was administered, 76 patients, representing 58.01%, were females and 55 patients, representing 41.99%, were males (figure no. 1).

Of them, 58 patients (44.27%) were totally edentulous or in the process of becoming totally edentulous (maxillary), 51 patients (38.93%) were totally edentulous or in the process of becoming totally edentulous (mandible), and 22 patients (16.80%) were totally edentulous or in the process of becoming totally edentulous (bi-maxillary) (figure no. 2).

**Figure no. 1. Gender distribution of patients**

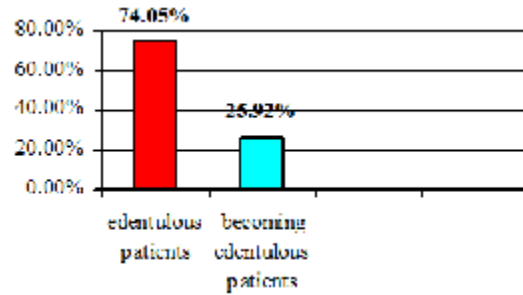


**Figure no. 2. Total edentation topography**



The patients included in the study who had already been totally edentulous when the questionnaire was administered, namely 97, representing 74.05%, were marked as belonging to Category I, while the rest of 34 patients, representing 25.95%, who were in the process of becoming totally edentulous uni- or bi-maxillary, were marked as belonging to Category II (figure no. 3).

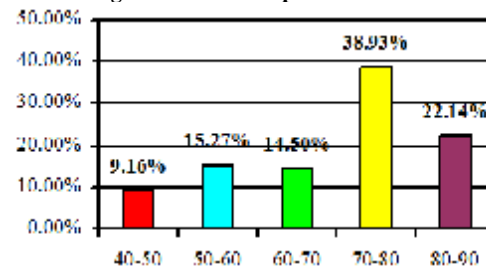
**Figure no. 3. Description of the study population according to edentation stage**



The distribution of patients depending on age:

- patients in the 40-50 age bracket – 12, representing 9.16%;
- patients in the 50-60 age bracket – 20, representing 15.27%;
- patients in the 60-70 age bracket – 19, representing 14.50%;
- patients in the 70-80 age bracket – 51, representing 38.93%;
- patients in the 80-90 age bracket – 29, representing 22.14%.

**Figure no. 4. Age distribution of patients**



The questionnaire administered to the 131 patients that were totally edentulous or in the process of becoming totally edentulous is presented below:

*Questionnaire*

**1. How do you perceive total edentation (absence of all teeth on one or two arches), a situation you have already faced or you are about to face:**

- a. as a predictable and normal evolution of your dental situation (marked as Variant I);
- b. as a general transitory disorder that can be addressed in a relatively short period of time (marked as Variant II);
- c. as a great trauma or social handicap (marked as Variant III).

**2. Have you worn full or partial mobile dentures so far?**

**3. Have you been provided with only treatment alternatives entailing complete dentures (acrylic or metal plate) or have you been presented treatment solutions entailing implant-supported fixed prosthetic restorations or modern guided bone regeneration techniques (bone augmentation or addition), including appropriate arguments related to fixed prosthesis: each procedure, cost, aggressive intra- and post-operation trauma etc.:**

- a. only full dentures alternative has been presented (marked as Variant I);
- b. both alternatives, namely implant-supported fixed prosthetic restorations employing modern guided bone regeneration techniques and mobile dentures, have been presented thoroughly, including explanation related to advantages, disadvantages, cost, risks etc. (marked as Variant II);
- c. both alternatives, namely implant-supported fixed prosthetic restorations employing modern guided bone regeneration techniques and mobile dentures, have been

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briefly presented (marked as Variant III);

d. only implant-supported fixed prosthetic restorations employing modern guided bone regeneration techniques has been presented (marked as Variant IV).

4. Have you opted for the prosthetic restoration using mobile full dentures (acrylic or metal plate) (marked as Variant I) or for the implant-supported fixed prosthetic restoration employing modern guided bone regeneration techniques (bone addition and augmentation) (marked as variant II);

5. Have you opted for mobile full dentures because:

a. it is less expensive (marked as Variant I);

b. the difficulties entailed by the trauma related to the surgical procedures meant to guided tissue regeneration (bone addition and augmentation), followed by the dental implants insertion and the performance of implant-supported fixed prosthetic restorations (marked as Variant II);

c. the time taken to have the restoration made, less time in the case of acrylic or metal plate mobile full dentures (marked as Variant III).

6. The implant-supported fixed prosthetic restorations employing modern guided bone regeneration techniques treatment is an extremely comfortable alternative. However, in order for such treatment solution to remain viable in time, maintenance procedures are necessary at regular intervals, which are both laborious and expensive. Have you been informed by the experts who performed the implant-supported prosthetic restorations about the necessity and cost of such mandatory maintenance procedures?

7. Have you been aware of the information related to the implant-supported fixed prosthetic restorations maintenance and have you assumed the responsibility for such treatment failure in case the requirements related to maintenance procedures, within the framework of the informed agreement, are not met?

### RESULTS

The results of the questionnaire administered to the batch of 131 patients were as follows:

1. to the first item in the questionnaire the results were as follows (figure no. 5):

- Variant I, 36 subjects responded, representing 27.48%;
- Variant II, 65 subjects responded, representing 49.62%;
- Variant III, 30 subjects responded, representing 22.90%.

2. to the second item in the questionnaire, 88 subjects, representing 67.18%, responded affirmatively, while 43 subjects, representing 32.82%, responded negatively (figure no. 6);

3. to the third item in the questionnaire we elicited the following answers (figure no. 7):

- Variant I, 22 subjects responded (all in the 80-90 age bracket) representing 16.79%;
- Variant II, 65 subjects responded, representing 49.62%;
- Variant III, 39 subjects responded, representing 29.77%;
- Variant IV, 5 subjects responded, representing 3.82%;

4. to the fourth item in the questionnaire, 95 patients, representing 72.52%, opted for the acrylic or metal plate mobile full dentures (marked as Variant I), while 36 subjects, representing 27.48%, opted for implant-supported fixed prosthetic restoration, employing modern guided bone regeneration techniques (bone addition and augmentation) (marked as Variant II) (figure no. 8);

5. to the fifth item in the questionnaire (statistical analysis related to the number of 95 patients who chose the acrylic or metal plate mobile full dentures, we elicited the following answers (figure no. 9):

- Variant I, 46 subjects responded, representing 48.42%;
- Variant II, 33 subjects responded, representing 34.74%;
- Variant III, 16 subjects responded, representing 16.84%.

6. to the sixth item in the questionnaire (statistical analysis related to the number of 36 subjects who opted for implant-supported fixed prosthetic restoration employing modern guided bone regeneration techniques (bone addition and augmentation), 29 subjects responded affirmatively (80.56%), while 7 subjects responded negatively (19.44%) (figure no. 10);

7. to the seventh (the last) item in the questionnaire (statistical analysis related to the number of 29 subjects who were informed on the necessity and cost of mandatory maintenance procedures), 27 subjects (93.10%) responded affirmatively, while 2 subjects (6.90%) responded negatively (figure no. 11).

Figure no. 5. Patients' perception about total edentation

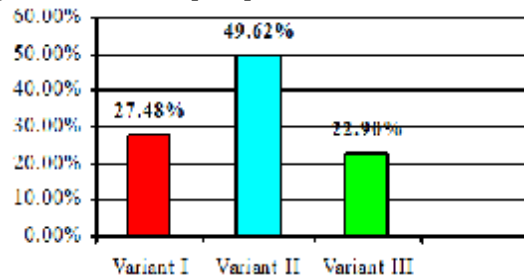


Figure no. 6. Patients who previously wore total of partial prosthesis

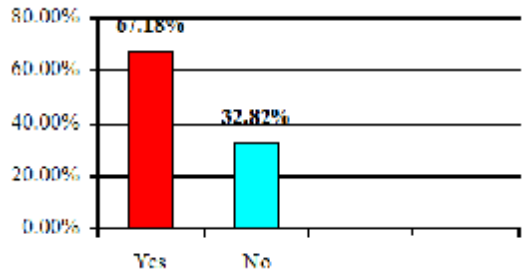


Figure no. 7. Patients' presentation of treatment options

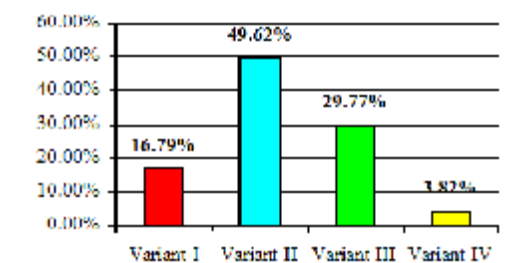
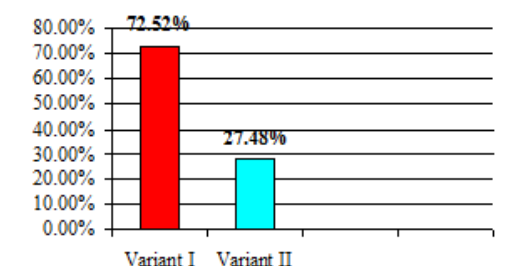
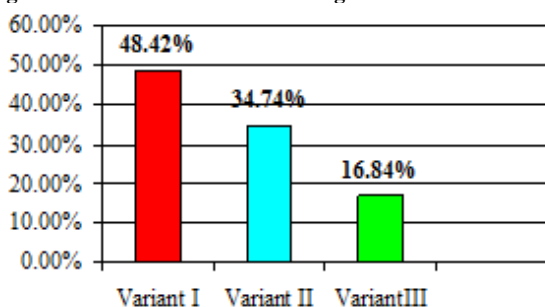


Figure no. 8. Treatment options

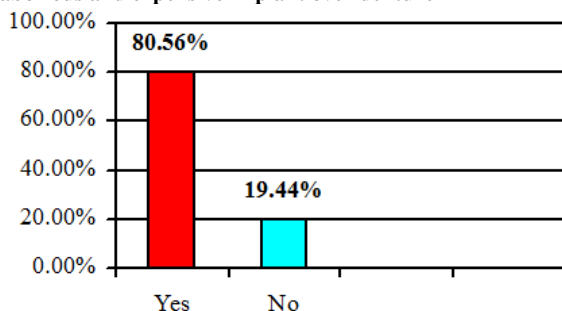


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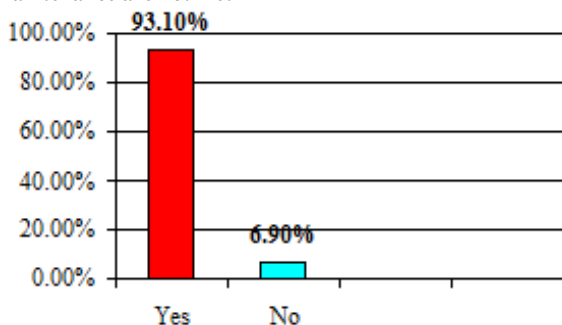
**Figure no. 9. The reason for choosing mobile full dentures**



**Figure no. 10. Patients' informing about regular check-ups, laborious and expensive implant over denture**



**Figure no. 11. Knowledge and risk taking in treatment with complete implant over denture when requirements related to maintenance are not met**



### DISCUSSIONS

Following the administration of the questionnaire to a number of 131 totally edentulous (maxillary, mandible or bi-maxillary) or in the process of becoming totally edentulous patients, although it was only a preliminary study, some very important aspects highlighted, which are mentioned below:

- as it can be seen, more and more young people are predisposed to becoming edentulous early (because of the lack of solid dental hygiene education, extremely aggressive carious processes that are not treated or are treated in haste, early periodontitis, or trauma) thus becoming totally edentulous at relatively early age. Thus, of the batch of totally edentulous or in the process of becoming totally edentulous patients to whom the questionnaire was administered (131 patients), 12 patients, representing 9.16%, belonging to the 40-50 age bracket were totally edentulous, showing that the percentage of young population that is affected by this condition is increasing;

- as for the way the subjects perceived total edentation, we found out that the majority of interviewed patients treated it as a transitory condition (49.62%), while the rest of the subjects, representing 27.48%, considered it a normal evolution of partial edentation, and only a percentage of 22.90% of the subjects perceived total edentation as a trauma and social handicap;
- of the batch of 131 subjects who participated in the study, most of them were mobile complete dentures wearers (67.18%), the experience being thus not new for them, while a percentage of 32.82% of the subjects included in the study stated that wearing full acrylic or metal plate dentures was an extremely new experience for them;
- as for the treatment alternatives for the total edentation restoration that were presented to the subjects participating in the study, a percentage of 16.79% patients were informed only about the alternative of full acrylic or metal plate dentures (patients in the 80-90 age bracket, for whom the dental-alveolar surgical intervention posed a high risk, considering the age of the patients), a lower percentage, representing 3.82% of the patients participating in the study, was presented only the alternative of implant-supported fixed prosthetic restoration employing modern guided bone regeneration techniques, while the rest of the patients included in the study (79.39%) benefited from explanations related to both types of treatment for total edentation: mobile (by using full acrylic or metal plate dentures) or fixed (by implant-supported prosthetic restorations employing guided bone regeneration techniques);
- moreover, of the total number of 131 patients to whom the questionnaire was administered, the majority (namely 72.521%) opted for full acrylic or metal plate dentures (48.42% because of low cost, 34.74% because the difficulties entailed by dental-alveolar surgical interventions, and only 16.84% because of the shorter period of time that was necessary to perform the full acrylic or metal plate dentures);
- of the 36 subjects (27.48%) who opted for implant-supported fixed prosthetic restorations employing modern guided bone regeneration techniques (addition and augmentation), only a percentage of 80.56% of the subjects (29 patients of the 36 ones who opted for fixed restoration) were informed about the fact that implant-supported fixed prosthetic restorations maintenance procedures were mandatory and expensive. Specifically, 27 patients, representing 93.10%, assumed the responsibility for the failure of this type of treatment in case the requirements related to maintenance procedures were not met in the framework of the informed agreement, while the other 2 patients (6.90%) categorically refused to assume such a risk;
- in addition, 7 subjects (19.44%) of the 29 who opted for implant-supported fixed prosthetic restorations employing modern guided bone regeneration techniques (addition and augmentation) responded negatively to the question related to their information about the maintenance procedures that are mandatory and expensive in order to preserve the implant-supported fixed prosthetic restorations in the dental arch for an as long as possible period of time.

### CONCLUSIONS

As a result of conducting the presented study, even though preliminary, some extremely important conclusions can be drawn as follows:

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- total edentation (maxillary, mandible or bi-maxillary) is not a condition that occurs only in patients over 65, increasingly affecting people under 50;
- the total edentation restoration using full acrylic or metal plate dentures is the preferred treatment option in Romania, because of the low cost, the shorter time necessary to perform such type of prosthetic restorations, and the absence of trauma and complications that could occur, following the performance of implant-supported fixed prosthetic restorations employing modern guided bone regeneration techniques (bone addition and augmentation);
- although oral implantology has become widely employed in the past two decades in Romania, the edentation treatment by implant-supported fixed prosthetic restorations employing modern guided bone regeneration techniques represents an extremely expensive method of treatment (including the subsequent mandatory maintenance procedures) being thus not affordable for the majority of patients in Romania.

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