

Theoretical and practical aspects in the maintenance processes of cement retained implant supported fixed restorations

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ABSTRACT

The lifespan of a fixed implant supported restoration is influenced by several factors: the medical team's experience, the superior technical and material endowment, the experience of the dental laboratory, but also maintaining a proper hygiene by the patient.

Purpose. *In this study, we insisted on the responsibility that rehabilitated patients through implant supported restorations should assume.*

Material and method. *The study was conducted between March 2016 and March 2018 on a group of 73 patients rehabilitated by fixed implant supported restorations using a questionnaire consisting of 7 questions.*

Results and discussions. *Maintaining a high degree of hygiene by regular or professional means of implant-prosthetic restorations leads to prolonging their life span. For this, it is necessary on the one hand for the medical team to make pertinent, logical, sufficient and easy to understand recommendations for all patients and on the other hand for the patients to implement the part of the recommendation that directly targets them.*

Conclusions. *The recommendations of the medical team on oral hygiene after fixed implant supported restorations should be done in a language that is appropriate and easy to understand by patients. To the same extent, the recommendations must be assimilated and respected by patients, as a significant component in maintaining good hygiene in fixed implant supported restorations is the patient.*

Keywords: fixed implant supported restorations, oral hygiene, chlorhexidine

INTRODUCTION

In general, oral rehabilitation through implant supported restorations of any type in dental medicine is an extremely laborious treat-

ment method, but at the same time very complex in almost all aspects: experienced medical team (implant specialist, prosthetic specialist, dental assistant, dental technician);

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complicated maneuvers both in the clinical compartment and in the dental laboratory; a multitude of materials; a very extensive technical and material endowment; as well as very high costs both pecuniary and in terms of time spent, and also physically and mentally.

Thus, for many totally or partially edentulous patients, dental implants may represent the only possibility of retaining fixed prosthetic restorations. These types of prosthetic restorations, fixed implant supported restorations, have demonstrated in time their psychological, but mostly functional qualities, of which their wearers can benefit: a very efficient diet due to a proper mastication process, a flawless phonation, a more satisfying physiognomy, the patient being able to smile and laugh without restriction, in a word, a patient's wellbeing manifested through satisfaction and gratitude (1).

However, in order for the patient's wellbeing to be maintained over time, it is necessary to apply maintenance procedures to this fixed implant supported restorations, time consuming and laborious procedures that are carried out in a complex medical follow-up of the patient.

GENERAL DATA

But, before proceeding to the effective implementation of this study, it is necessary to briefly clarify some notions, which we, the authors, consider to be extremely important:

- Maintenance:
 - **Technical:** the process of preserving a condition or situation or the state of being preserved; the process of keeping something in good condition (2);
 - **Medical:**
 - The extent to which a patient continues good health practices without professional supervision, as distinguished from adherence or compliance (3);
- Or**
- Designed or adequate to maintain a patient in a stable condition: serving to maintain a gradual process of healing or to prevent a relapse (4).
- There are two types of fixed implant supported restorations, depending on their retaining systems (4):
 - **Cement-retained restorations**, with the advantage of cheaper structure but with very limited possibilities to

control dental implants from a mechanical point of view;

- **Screw-retained restorations**, with a very good control of dental implants. These types of implant supported restorations present, as well as major drawbacks, the very high cost of manufacturing, the laborious technology, as well as the presence of retaining screws, which sometimes interfere with occlusal contacts, and sometimes may reduce the aesthetic factor.

As far as we are concerned, to carry out this study, as we have already stated in the title, we have strictly stopped on the first mentioned category of implant supported restorations, namely cement-retained restorations.

Another term that we want to clarify from the beginning of this material is „medical follow-up of the patient in implant supported rehabilitation”. Specifically, in implant supported rehabilitation, by means of medical follow-up we understand (5, 6): prevention, detection, treatment, control and treatment of recurrences and/or newly emerged diseases. Patient medical follow-up includes (5-12):

- Updating the medical and dental history;
- Extraoral and intraoral soft tissue examination;
- Clinical evaluation of dental implants by all possible means;
- Performing control x-rays;
- Removal of microbial plaque and tartar;
- Verifying that the patient ensures a correct oral hygiene.

Generally, these fixed cement-retained implant supported restorations are different from the normal contours of the natural teeth and classical periodontal tissues, so this involves special and detailed instructions for both the dentist who carries out the maintenance maneuvers of these prosthetic restorations in the dental office as well as the patient for their home care (5,6).

Thus, starting a medical follow-up process, with regard to cement-retained implant supported restorations, involves a precise prevention training program for oral hygiene, of which we mention (5-7, 13-18):

- Training and persuading the patient on the benefits of the continued application of preventive measures recommended by the physician and/or cabinet medical assistance;
- Changing the attitude of the patient towards the nature, evolution and consequences of dental affections;

- Creating the habit of daily self-hygiene and periodic professional hygiene at different time intervals, recommended by a dental practitioner, depending on the particularities of each clinical case.

PURPOSE

Starting from the title of this material, which refers to the maintenance processes of cement-retained restorations, it should be mentioned that the maintenance of these implant supported restorations and also of dental implants involves first the patient involvement, and second the medical team (5-7, 13-18). In the case of this study, we will only insist on the responsibilities of that patients rehabilitated through cement-retained implant supported restorations, should assume.

Thus, the role of the patient in controlling the microbial plaque in implant supported rehabilitation may comprise several steps (taken from the literature), of which we mention (5-7):

- Awareness of daily oral hygiene importance and presence at regular medical checkups, according to the recommendation of the dentist (2-3 times a year);
- The patient must take responsibility for maintaining oral health and have the necessary dexterity to correctly perform hygiene measures;
- Performing personal dental brushing with manual and mechanical toothbrushes;
- Use of personal dental brushing aids: interdental brushes, gum stimulator etc.;
- Immersion of toothbrushes in chlorhexine, an important oral antiseptic;
- Use of dental floss, super floss, immersed in chlorhexidine, used in the evening, before bedtime;
- If the patient has implant supported restorations that stain after the use of chlorhexidine, he must use a cotton applicator (immersed in chlorhexidine) only in the indicated areas.

MATERIAL AND METHOD

Starting from these stages regarding the role of patients in controlling the microbial plaque in implant supported rehabilitation, the steps mentioned above and their awareness in the maintenance processes of cement-retained implant supported restorations, but also for making a very concise material, we composed a questionnaire consisting of 7 questions, which

we applied to a number of 73 patients rehabilitated by cement-retained implant supported restorations, who followed these treatments in our private dental offices from Bucharest where we conduct our medical work, between March 2016 and March 2018.

All subjects in the study were aged between 27 and 64 years old, distributed as follows: 53 of the subjects were female (72.60%), while the remaining 20 subjects were male (27.40%) (Fig. 1).

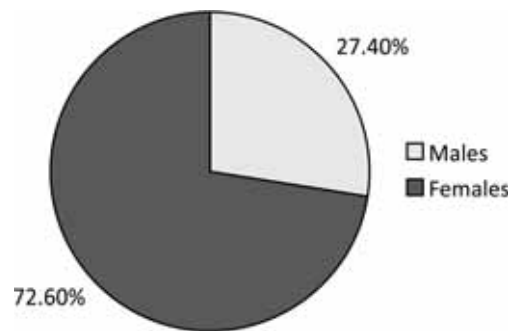


FIGURE 1. Gender distribution of the study group

Next, we present the questionnaire applied to 73 subjects:

1. Have you understood and, above all, are you aware of the importance of daily oral hygiene and presence on regular medical checkouts that your dentist has to carry out 2-3 times a year? a. Totally; b. Partially; c. Not at all?

2. How do you appreciate the effort made by the medical team for you to become aware of your role as a patient, in the maintenance of the cement-retained implant supported restorations you have in the oral cavity, have been explained to you all the information and responsibilities required to achieve efficient maintenance processes? a. Very good; b. Satisfactory; c. Poorly; d. No training has been done to me.

3. As a patient, are you willing to assume, after following the training done by the dentist, the responsibility to maintain a satisfactory quality of oral health after insertion of dental implants and application of implant supported restorations? a. Yes; b. Yes, but in co-responsibility with the dentist; c. No.

4. Do you perform dental brushing regularly according to the dentist's instructions, using manual and mechanical toothbrushes (classical methods), but also interdental brushes and gum stimulators (adjunctive methods for classic dental brushing), as recommended by the dentist and the manufacturers? a. Yes; b. From time to time; c. No.

5. For a good implementation of maintenance procedures for cement-retained implant supported restorations, do you use in the evening

before going to bed, dental floss and super floss?
a. Always; Occasionally; c. Not at all.

6. What do you use as an antiseptic for the oral cavity? a. alcohol based mouthwash; b. Chlorhexidine based mouthwash; c. Alcohol-free mouthwash.

7. If you are using chlorhexidine as an antiseptic for your oral cavity, have you had situations when cement-retained implant supported restorations in your cavity have changed their color? a. Yes and what type of prosthetic restoration; b. Not what type of prosthetic restoration; c. From time to time and what type prosthetic restoration.

RESULTS AND DISCUSSIONS

After applying the questionnaire, the following results were obtained:

Concerning the understanding and awareness of the importance of maintaining a daily oral hygiene and presence at medical check-ups that the dentist has to carry out regularly, of the 73 subjects involved in the study, only 53 of them (representing 72.60%) have fully understood this while 20 subjects (representing 27.40%) only partially understood this (Fig. 2).

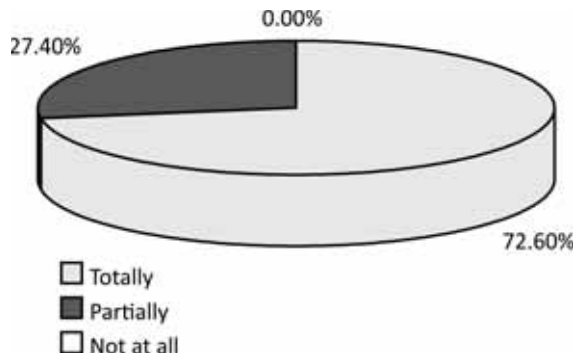


FIGURE 2. Understanding and awareness of the importance of oral hygiene and periodic medical checkouts

Concerning the effort of the medical team to make patients aware of the role they play in the maintenance of the implant supported restorations they have in the oral cavity, all the subjects involved appreciated it as a very good one (answer a.).

In the third question related to the responsibility for maintaining a satisfactory quality of oral health after surgery, only 42 of the patients (57.53%) fully assumed this, while 31 subjects (representing 42.47%) are willing to take responsibility together with the treating dentist (Fig. 3).

About performing dental brushing with classical and adjunctive methods according to the doctor’s instructions only 67 of the patients (representing 91.78%) strictly comply with the instructions given by dentist, while 6 of the subjects involved in the study (representing 8.22%) follow these instructions only from time to time (Fig. 4). This different way of applying the doctor’s recommendations for dental brushing shows, however, that all patients are aware more or less of the importance of maintaining good oral hygiene.

Regarding the use of dental floss and super-floss in the evening as a stage of maintenance of implant supported restorations, all patients involved in the study specified that they regularly follow the instructions of the dentist.

Asked about the substance used as an antiseptic of oral cavity in the postoperative and in the maintenance period of implant supported restorations, all patients indicated chlorhexidine based mouthwash. This shows that, on the one hand, physicians are convinced by the results of using chlorhexidine as a basic antiseptic substance and recommend it with confidence, and on the other hand that patients are satisfied with the effects of chlorhexidine in both the postoperative and the maintenance period.

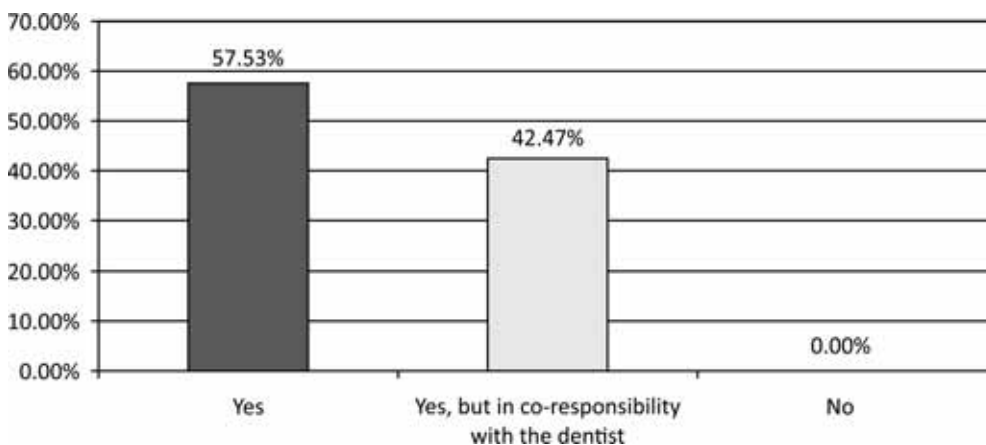


FIGURE 3. Taking responsibility for maintaining a satisfactory quality of oral health

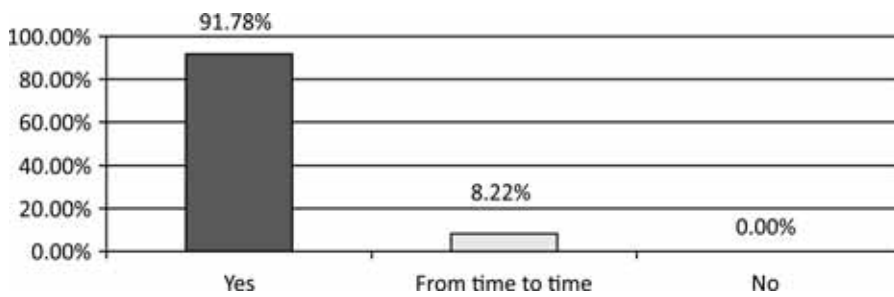


FIGURE 4. Following dental brushing instructions.

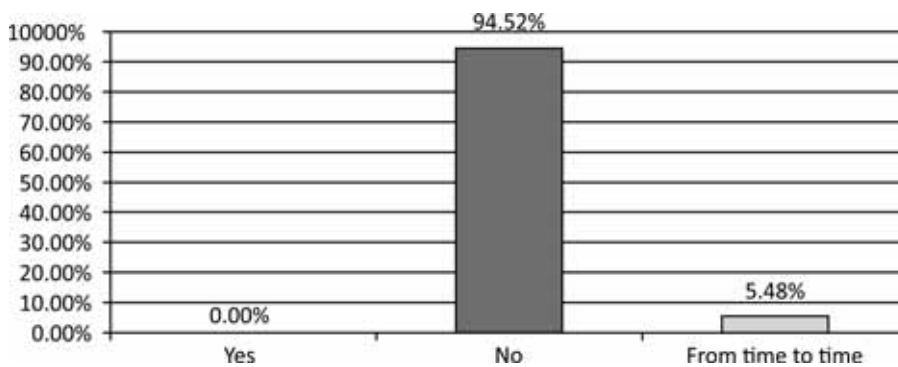


FIGURE 5. Color changes observed using chlorhexidine as an antiseptic

In the last question related to the color changes of the implant supported restorations, 69 of the subjects involved in the study (representing 94.52%) chose the answer b, meaning none of the implant supported restorations were stained due to the use of chlorhexidine, it should be noted that for all these types of prosthetic restorations, the aesthetic component was represented by ceramic masses. The remaining 4 patients included in the study (representing 5.48%) responded affirmatively to answer c., prosthetic restorations were occasionally stained under the action of chlorhexidine, all prosthetic restorations having the aesthetic component made of composite resins) (Fig. 5)

CONCLUSIONS

After studying the answers to the 7 questions, we can conclude on several aspects, some extremely interesting, as follows:

Although all patients appreciated the medical team’s recommendations as very pertinent, extremely logical, and the training quite effective, not all of them understood these things very well, which denotes either a very scientific and sophisticated vocabulary from the dental medical team, or a degree of perception and / or some deficient intellectual training of the patients involved in the study.

It is very clear that everybody has to assume their own actions to ensure the maintenance of cement-retained implant supported restorations: the doctor is responsible for what he does in the dental office and for the clarity and accuracy of the instructions he has drawn to the patient, and the patient is responsible for the correctness with which he apply the oral care procedures following the instructions of the medical team.

All patients in the study were aware, more or less, of the need to perform a proper brushing, according to the dentist’s instructions, using manual and mechanical toothbrushes (classical methods), but also interdental brushes and gum stimulator (adjunctive methods for classic dental brushing) as recommended by the dentist and the manufacturers.

All patients enrolled in the study use in the evening, before bedtime, dental floss and super floss, which fully complies with the protocol described in the first part of the study to ensure a good maintenance of cement-retained implant supported restorations.

Chlorhexidine is the ideal antiseptic in maintenance procedures for all types of implant supported restorations in both mouthwashes and other antiseptic combinations.

None of the cement-retained implant supported restorations having the aesthetic com-

ponent made of ceramic masses did not undergo color changes under the action of chlorhexidine, while the same type of implant supported restorations, but having the aesthetic component made of composite resins, suffered from time to time transient discoloration, following the use of chlorhexidine and chlorhexidine based compounds.

RECOMMENDATIONS

After elaborating these new conclusions, as authors of the material, we can make some recommendations as follows:

The use from the dental medical team to draw instructions to patients of a simple and intelligible language, with explanation of all scientific terms, when their use cannot be avoided.

All hygiene instructions and guidelines for patients, to ensure correct maintenance of cement-retained implant supported restorations should be made also in writing, accurate and extremely concise.

Brushing techniques recommended to patients should not only be explained, but should be demonstrated to patients, when possible, using dental demonstration models.

Regardless of the type of implant supported restoration, it is advisable to recommend to patients the use of dental floss and super-floss in the evening, before bedtime, for a good oral health.

Frequent use of chlorhexidine-based compounds: mouthwashes, other antiseptic solutions etc.

Although costs are slightly increased, it would be ideal that cement-retained implant supported restorations to have ceramic masses as aesthetic component in order to avoid color changes following the use of chlorhexidine and chlorhexidine based compounds.

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