

Evaluation of the participation of edentulous patients treated with implants in the supportive periodontal therapy (SPT) program and its relationship with their satisfaction with the treatment

Running title: Supportive periodontal therapy

Abstract

Disease prevention around the implant should be an important motivation for the dentist and the patient. This maintenance should be done with a specific schedule and at regular intervals. The aim of the present study was to investigate the relationship between the participation of completely edentulous patients treated with implants in the Supportive Periodontal Therapy (SPT) program and their satisfaction with the treatment. This descriptive cross-sectional study will be performed on 28 completely edentulous patients referred to Tabriz Dental School who are applying for implants. After obtaining informed written consent, patients whose implant treatment has been completed enter the study. The satisfaction rate was determined by the satisfaction questionnaire, and the participation rate was determined by the SPT program. The examinations will be performed in 4 stages (immediately at the starting point of the SPT program, 2 months later, and 6 months later). In control sessions, in addition to evaluating the GI (gingival index) to evaluate periodontal health, the initial phase of periodontal treatment is performed, and if additional treatments are needed, necessary measures such as radiography and planning for complementary therapies. Takes place. SPSS software version 20 will be used for data analysis. A probability value of less than 0.05 will be considered a significant level. If possible, the relationship between participation and patient satisfaction will be examined by Spearman correlation and linear regression.

Keywords: *Implant, supportive periodontal therapy (SPT), patient satisfaction, periodontitis*

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Introduction

Today, the use of dental implants to replace missing natural teeth is a standard treatment option with well-developed components (1). Dental implants have a normal function, almost close to the normal teeth of patients. Analysis of facial muscles and jaw bones can greatly impact the beauty of patients. Implant prosthesis causes normal muscle function and, by stimulating the jaw bone, prevents its analysis and maintains its thickness when natural teeth are present (2). During the early years of implantology, the surgical phase of implants has been emphasized in the long-term success of their osteointegration (3). Today's knowledge states that maintaining soft tissue health is as important in implant maintenance and long-term success as osteointegration (4). Prevention of disease around the implant should be an important incentive for the dentist and the patient, and this maintenance should be done with a specific schedule and at regular intervals (5). Supportive periodontal therapy (SPT) is very important in patients receiving implants and the relationship between the patient and the dentist. Only through the team effort between the dental staff and the patient himself can the success of the implant continue with confidence (6). Proper maintenance of the tissues around the implant is critical (7). In order to prevent the effect of primary microbial accumulation on dental implants, at least 85% of the microbial plaque should be removed by the patient to ensure the long-

term success of the implant (8). The term periodontal supportive therapy emphasizes the basic need for treatment to support the patient's own efforts to control periodontal infection (9). According to the American Academy of Periodontology guidelines, the SPT should include all the components of a routine dental reminder examination, as well as cases, risk assessment and reassessment, removal of plaque and upper and lower gingival masses, and re-treatment anywhere. There is also a fixed or recurrent disease. It determines the difference between SPT and normal care (10,11). In a 2016 study of 356 cases of patients with gingival surgery, Ardakani et al. found that despite the importance of maintenance treatments after gingival surgery, more than 90% of patients who underwent gingival surgery never received Supportive treatments were not sought (12). The need for SPT treatments in patients with periodontitis and orthodontics has also been addressed (13,14). On the other hand, the evaluation of the health-related quality of life and the impact of clinical practices on people's health has recently been considered (15). Numerous studies have been performed to evaluate patients' satisfaction with implant treatment. Studies of edentulous patients have shown high satisfaction levels in patients with implant-based overdentures and patients with complete implant-based fixed dentures. (16,17) It seems that although implant treatment is a serious development among dental treatments to replace teeth, due to some problems such as

inadequate anatomy and severe bone resorption, carelessness in choosing the appropriate treatment plan, problems due to lack of communication, a suitable dentist with the patient, such as the length of treatment, the high cost of treatment, and finally the type of patients' attitudes and high expectations sometimes cause patients to be dissatisfied with implant treatment. (18) Examining the relationship between dentist and patient, Misra et al. (2013) stated that dentists remembered more information than patients and that technical issues (e.g., crowns/bridges) were reported more than psychiatry (such as pain). The agreement between the dentist and the patient on the issues discussed and the actions taken was appropriate. (19) Kincey et al. Reported high patient satisfaction with their GPs for the hospital. (20) According to the above, the level of patient satisfaction can affect the level of loyalty and, subsequently, accept the next recommendations of the doctor. In previous research, each of the cases of patient satisfaction, patient relationship with the dentist, and patient participation have been analyzed separately. On the other hand, according to the above, patient satisfaction can affect the level of loyalty and subsequent acceptance of the next doctor's recommendations. So far, no study has examined the relationship between implant patients' satisfaction and their participation. Therefore, in this study, we will examine the relationship between the participation rate of completely edentulous patients treated with implants in the Supportive Periodontal Therapy (SPT) program and the level of treatment satisfaction.

Methods and materials

This descriptive cross-sectional study was performed on 28 completely edentulous patients referred to Tabriz Dental School who applied for implants in both jaws. Patients whose implant treatment had been completed were included in the study. First, written informed consent was received from patients. Then, a questionnaire related to treatment satisfaction was completed, and the importance of participating in the SPT program was explained. In the control sessions, in addition to evaluating the GI (gingival index) to assess periodontal health, if necessary, the initial phase of periodontal treatment was performed, and if additional treatments were needed, necessary measures such as radiography and planning for complementary therapies were done.

Data collection tools included a patient satisfaction questionnaire, a checklist for participation in the SPT program, and determining the plaque index (to assess oral health status by measuring the plaque index).

The studies were performed in 3 stages (immediately at the starting point of the SPT program, 3 months later, and 6 months later).

Satisfaction: To determine the level of satisfaction, the patient's satisfaction questionnaire was used for implant treatment (Yaghini et al., 2018). The Satisfaction Questionnaire consisted of two parts:

The first part consisted of demographic questions and background information about the treatment.

The second part included 15 questions related to measuring patient satisfaction. Questions including patient satisfaction were assessed separately from various aspects, including implant performance and function, its beauty, implant cleaning and hygiene, cost, and time spent for treatment.

For patients who were not literate enough to complete the questionnaire, the researcher explained the questions and marked the answers.

The Likert scale was used to score and determine patients' satisfaction scores. Thus, for each question, three options were considered: a) (yes, I agree, b) (relatively agree, and) c (disagree) 3 and option (b) (score 2 and option c (score 1), except for questions 7 and 9, which were scored in reverse. Therefore, a score of 15-25 indicates low satisfaction, a score of 25-35 indicates moderate satisfaction, and a score of 35-45 indicates high satisfaction.

SPT program: To determine the degree of cooperation (at 4 levels) in periodontal maintenance treatments, SPT was divided into 4 groups (22).

1. Fully cooperative patients: This group included individuals who were fully and regularly referred for periodic visits and followed exactly the recommended schedule.

2. Patients who had partial cooperation: This group included those patients who followed the recommended program during the 6 months after the active phase of treatment and had regular visits, but after 6 months, they were referred irregularly and occasionally.

3. People who had poor cooperation with maintenance treatments: This group included patients who came in periodically, occasionally, or incompletely from time to time for periodic visits.

4. Patients who did not cooperate: This group of patients did not refer back for the recommended maintenance treatments

Ethical consideration:

The procedures were fully explained to the patients. Patients were completely free to enter the study or not. The consent of all the research participants was obtained to participate in the research. Patients could leave the study if they wished after the start of the study, and they were assured that this would not affect the quality of the service provided to them. The entire study process was conducted under the supervision of the group manager and the head of the department, and the patient's information was not disclosed in any way.

Statistical analysis of data:

The data obtained from the study was analyzed by SPSS 20 statistical software. The results of the study were reported using descriptive statistics methods. ANOVA analysis of variance, Tukey's post hoc test, Fisher's exact test, and chi-square were used to check the objectives.

Results

In this study, 28 edentulous patients treated with implants were investigated, 57.1% of the patients were female, and 9.42% were male, and the highest frequency was related to patients with a diploma with a frequency of 1.57%, followed by post-diploma degrees with a frequency of 1.57%, 4.21%, and a bachelor's degree was the least frequent (1.7%). The average age of the patients was 6.68-+61 years, which varied from a minimum of 46 to a maximum of 73 years. The frequency of people in need of periodontal treatment was 4.21%.

Objective one: to determine the participation rate of completely edentulous patients treated with implants in the SPT program

Investigations showed that patients' participation rate in the SPT program is 64.3% full participation, 17.9% partial participation, 10.7% weak participation, and 7.1% non-cooperation.

And in the comparison of the frequency of types of gingival index, the results showed that in the next three months, the frequency of patients with healthy and normal gums is 57.1%, gums with mild inflammation are 25%, and gums with moderate inflammation are 17.9%. In the next six months, the frequency of patients with healthy and normal gums is 78.6%, those with mild inflammation are 17.9%, and those with moderate inflammation are 3.6%.

Also, the results showed that in both follow-ups three and six months after implant placement, all patients whose gingival index was 2 participated fully in the SPT program.

In three months after implantation, 42.9% of patients whose gingival index was 1 had full participation, 28.6% partial participation, and 28.6% weak participation. Six months after implantation, all patients whose gingival index was 1 fully participated in the SPT program.

Objective two: To determine the level of satisfaction of completely edentulous patients treated with implants

In three months after implant implantation, the satisfaction level of patients was 30.78±5.93 (from the maximum score of 45), and in six months after implantation, it was 31.07±6.44. Three months after implantation, 39.3% had high satisfaction, 39.3% had moderate satisfaction, and 21.4% had low satisfaction. Six months after implantation, 46.4% had high satisfaction, 39.3% had moderate satisfaction, and 14.3% had low satisfaction.

Objective 3: To determine the relationship between the level of satisfaction of completely edentulous patients treated with implants and the level of their participation in the SPT program. The results show that patients' satisfaction level based on their participation in the SPT program has a significant difference in three months (P=0.003) and six months (P=.001).

The studies indicate that in both 3 and 6 months of follow-up, patients' satisfaction level based on the level of full participation is significantly higher than other patients. In both three and six months after implantation, 61.1% of Patients who fully participated in the SPT program had high satisfaction. But none of the patients who did not fully participate in the SPT program (relative participation, weak and non-cooperative) did not have much satisfaction.

Discussion:

SPT is defined as regular visits to the doctor for periodontal care and maintenance, which forms the basis of long-term success after periodontal implant placement. Furthermore, It has been shown to be an effective method of maintaining implant success.

In the present study, the participation rate of edentulous patients in a periodontal supportive treatment program after implant placement was 64.3% full participation, 17.9% partial participation, 10.7% weak participation, and 7.1% with no cooperation.

Cardaropoli et al.'s study (2012), in a 5-year follow-up of supportive periodontal treatments in dental implants, showed that 77.1% of patients fully participated in the SPT program. The results of the study of these researchers showed that the placement of bone implants is a reliable reason for a positive effect on participation in the SPT program.

The study by Lafzi et al. reported that 3.4% had full cooperation, 7.3% had partial cooperation, 53.3% had weak cooperation, and 36% had no cooperation in carrying out maintenance treatments following periodontal treatment.

In the present study, the participation of patients in the SPT program, based on the gingival index, showed that the frequency of full participation was 62.5% in people with healthy gums (zero index), 42.9% in people with mild inflammation (one index) and People with moderate inflammation (index two), was 100%.

The study of Gabay et al. (2021) showed that in patients with chronic generalized periodontitis, the implementation of the SPT program reduces bleeding during probing. These researchers stated that SPT has a significant positive effect on pocket depth indicators, bleeding, and implant bone surface in long-term follow-up and should be an essential part of implant treatment.

In a 4-year follow-up, Barot et al. (2021) addressed the importance of supportive periodontal treatment (SPT) programs in the treatment of implants and periodontitis. They

stated that patients with a history of periodontal disease are at greater risk for peri-implant disease and, consequently, the loss of their implants. Comprehensive periodontal evaluation and supportive periodontal therapy are key elements to ensure long-term maintenance and overall treatment success. Therefore, with proper management and good patient compliance, clinically acceptable long-term results can be obtained after implanting dental implants in patients with a history of periodontitis.

SPT is a suitable method for periodontal maintenance during implant placement in patients with periodontitis

Rocuzzo et al. demonstrated successful management of implants with a survival rate of 94.7% in 15 subjects with a history of advanced periodontitis who underwent periodontal maintenance and treatment prior to implant placement, showing non-compliance with SPT with a higher incidence of peri-implant marginal bone loss. In the follow-up, it was also associated with an increase in the incidence of implant failure. In addition, a higher implant survival rate was observed in the lower jaw (96.2%) than in the upper jaw (93.5%). However, at the compliance level of implant-treated patients. Patients undergoing periodontal treatment showed better adaptation than patients who had no previous experience with periodontal treatment

A study by Ardakani et al. (2016) showed that despite the importance of maintenance treatments after gum surgery, more than 90% of patients who underwent gum surgery never went to receive supportive treatments.

The results of the present study showed that the frequency of high satisfaction was 39.3% in three months after implantation and 46.4% in six months after implantation. The frequency of low satisfaction was 21.4% in the next three months and 14.3% in the next six months.

The present study's results showed that the satisfaction level in patients who fully participated in the SPT program was significantly higher than that of patients who did not fully participate. This trend was observed throughout the entire length of the SPT program.

In a systematic study, Fu et al. (2021) showed that overall satisfaction and satisfaction with speech, comfort, chewing ability, aesthetics, and social life in two types of implants (mandibular overdenture with two implants and mandibular overdenture with one implant) were similar. Both types of implants had better satisfaction than conventional complete prostheses

The results of the study by De Souza et al. (2016) evaluating the satisfaction level of edentulous patients rehabilitated with implant-supporting prostheses indicated that the functional and aesthetic factors were very satisfactory, which led to an increase in self-esteem and quality of life.

Insensitivity to the patient's expectations and lack of recognition and understanding of her expectations causes the medical system as well as the patients, to bear high costs and complications.

One of the limitations of the present study is the small volume of investigated patients and the limited follow-up time of patients in the SPT program, which can be effective in the results.

Therefore, using the periodontal support treatment program after implant placement as a practical, necessary and effective system is inevitable, and planning in this field is essential.

Conclusion

The participation rate of completely edentulous patients in the SPT program after implant placement was 64.3% with full participation, 17.9% with partial participation, 10.7% with weak participation, and 1.7% with no cooperation.

Based on the gingival index, patients' participation in the SPT program showed that the frequency of full participation was 62.5% in people with healthy gums (zero index), 42.9% in people with mild inflammation (one index), and 42.9% in people with inflammation. The average (index two) was 100 percent.

The frequency of high satisfaction was 39.3% in three months after implantation and 46.4% in six months after implantation. The frequency of low satisfaction was 21.4% in the next three months and 14.3% in the next six months.

The level of satisfaction in patients who fully participated in the SPT program was significantly higher than in patients who did not fully participate. This trend was observed throughout the entire length of the SPT program.

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