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ASPECTS RELATED TO THE FOLLOW-UP OF PATIENTS WITH REMOVABLE PROSTHESES

Grădinaru Irina[1] , Tărniceriu Cristina Claudia[2*], Hurjui Loredana Liliana[2*], Hurjui Ion[2], Balcoș Carina[1], Antohe Magda Ecaterina[1]

[1] „Grigore T. Popa" University of Medicine and Pharmacy, Iasi, Romania, Faculty of Dental Medicine

[2] „Grigore T. Popa" University of Medicine and Pharmacy, Iasi, Romania, Faculty of Medicine

***Corresponding authors:** cristinaghib@yahoo.com; loredana.hurjui@umfiasi.ro

Abstract

The purpose of the study was to analyze and quantify the factors involved in the adaptation process to removable prostheses related to the patients' general condition and the number of visits to the dental medicine cabinet during the monitoring period. The study involved 85 patients, diagnosed with partially extended edentation, who reported to the Educational Center of the Faculty of Dental Medicine, Iasi, between 2018 and 2020 in view of reconstructing the integrity of their dental arches. The patients' age ranged between 38 and 79 and the study lot comprised 50 women and 35 men. The removable prostheses included partially removable acrylic prostheses in a percentage of 51%, partially removable skeletal prostheses in a percentage of 25% and partially removable flexible prostheses in a percentage of 24%. Planning oral health services will be a challenge for the professions in the dental medicine, with the impact of the increase of focus on dental unit loss on the subjective evaluation of patients of their own health and life quality. It is clear that the research in this field is not sufficient and that well-coordinated studies are necessary to address the impact of the use of partial skeletal removable prostheses on oral dental health.

Key words :follow-up , removable prostheses, quality of life, oral health, adaptation

Introduction

The patients' adaptation to removable prostheses is a complex process, with deep morpho-functional and psycho-behavioral implications, being frequently associated with a sensation of pain at the level of subjacent tissues, difficulties in mastication and phonation.Although we are witnessing a spectacular evolution of implanto-prosthetic rehabilitations, the number of removable prostheses constructed is substantial, with regard the prevalence reported, between 13% and 29% of the European adults. Taking into account the increased prevalence of using partial removable prostheses, it is pertinent to question the impact (if any) of these types of prostheses on the oral and general health[1,2,3].

Oral health exercises a powerful effect on the quality of life of most people, through its impact on daily activities, such as mastication, phonation, food ingestion and social functions. The evidence related to

the impact of removable prostheses on the quality of life is limited and the confusion factors seem to be the number and pattern of dental units loss, the patient's age, attitudes regarding tooth loss and the perceived benefits in case of wearing partial skeletal removable prostheses[4,5,6].

Old age has been associated with a decrease of the impact on the quality of life, correlated with oral health and, as it can be anticipated, the loss of teeth has been clearly associated with the deterioration of the life quality. However, the relationship between the loss of teeth and the reduction of the life quality is not a simple one[7,8,9].

The purpose of the study was to analyze and quantify the factors involved in the adaptation process to removable prostheses related to the patients' general condition and the number of visits to the dental medicine cabinet during the monitoring period.

Materials and Methods

The study involved 85 patients, diagnosed with partially extended edentation, who reported to the Educational Center of the Faculty of Dental Medicine, Iasi, between 2018 and 2020 in view of reconstructing the integrity of their dental arches. The patients' age ranged between 38 and 79 and the study lot comprised 50 women and 35 men(Fig. 1).

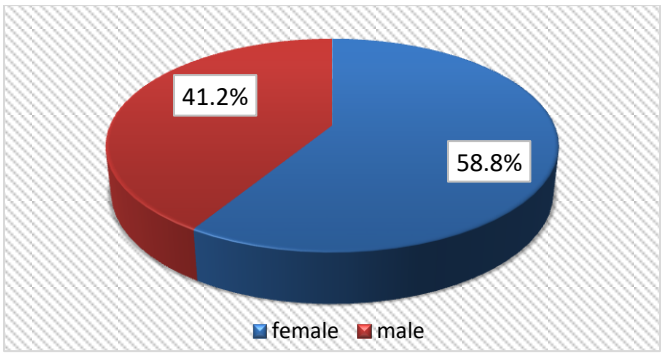

Fig. 1 Distribution of patients according with gender

Clinical observation shows us a discordant reaction of certain patients in relation to the gravity of the disorder. There are patients with minor disorders whose prognosis is favorable, but who manifest an exaggerated concern about their disease, are anxious and afraid of any symptom that may appear or of a complication of the disease (the unstable introvert); other patients who, on the contrary, have a more serious condition with an unfavorable prognosis, have a calm, peaceful, controlled and emotionally stable, behavior (stable introvert) .

Results and Discussions

The medical practice attests the presence of certain patients who fail to pay the required attention to important pathological moments of their condition, while others detail a series of subjective symptoms, with no connection whatsoever to the disease. Another category of patients (emotionally unstable introverts) can show inhibition in the relationship with the doctor, becoming reserved, shy, rigid and withholding communication, failing to describe their symptoms and who can answer affirmatively to all the doctor's questions, thus leading to medical errors[10,11,12].

The treatment with partial removable prostheses is a complex one. The adaptation of patients to this treatment is greatly influenced by their personality and the technological quality of the prostheses. These factors can influence the prostheses acceptance/non-acceptance ratio. The oral conditions (the condition of the oral cavity tissues) fails to accept the acceptance degree of the partial removable prostheses. Thus, patients with optimum anatomic conditions may experience the same problems in the adaptation stage as the ones with an accentuated resorption at the level of the alveolar crests.

The factor that clearly influences the acceptance degree is the *attitude towards prostheses*, prior to the prosthetic treatment. The patients' satisfaction regarding the removable denture is individually determined and often unpredictable, both for the doctor and for the patient.

The removable prostheses included partially removable acrylic prostheses in a percentage of 51%, partially removable skeletal prostheses in a percentage of 25% and partially removable flexible prostheses in a percentage of 24%.

Regarding the correlative aspects between the number of visits and the general pathology present in case of these patients, it was noticed that the highest incidence of visits to the dentist within 4 months and less (50.0%) was for the patients suffering from an endocrinological condition (mainly diabetes), slightly lower (41.7%) for those with gastrointestinal conditions at 6, 8 months and the lowest (121.5%) for those with osteoarticular conditions (1 year, 1.5 years)(Fig. 2).

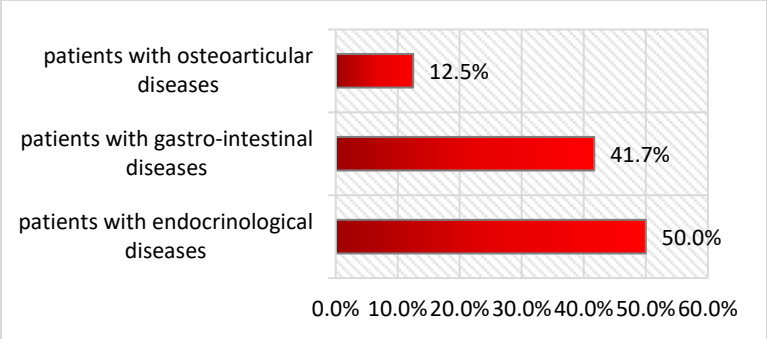

Fig.2 Correlative aspects between the number of visits to the dentist and the general pathology

It was assessed that the adaptation of the new removable prostheses occurred without any correction at just one out of 9 patients, while most other patients required multiple subsequent visits after the insertion of the removable prostheses.

After 1.5 years from the application of the removable prostheses, a small resorption was reported at 30% of the skeletal prostheses that used special systems, an average resorption at 45% of the wearers of classical skeletal removable prostheses, partially removable prostheses and flexible removable prostheses, 10% high resorption with wearers of flexible partially removable prostheses and acrylic partially removable prostheses(Fig.3).

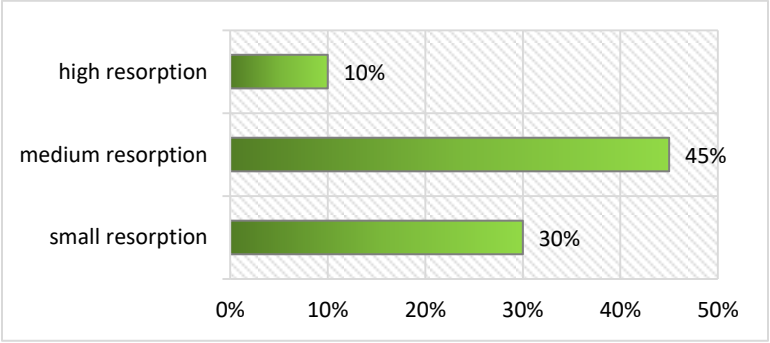

Fig. 3 Evaluation of the degree of resorption of bone support at patients with removable prostheses

In this line of international studies, Wolf Law came up with a theory according to which the bone regeneration and the regeneration of subjacent tissues is carried out with a physiological force. When the force applied on the bone structure is of an non-physiological nature, the bone responds by creating and stabilizing a force with a normal physiological weight and density.

In our studies, the results are opposable to the ones in the specialized literature, taking into account the fact that when the force is lower than normal, the bone structure responds by resorption and atrophy. Normally we can expect to see atrophy at the level of the alveolar crest, where the crest was not involved in mastication. When the crest is excessively involved, we assessed an apposition of bone tissue. When the crest is normally involved, we observed a bone structure with a normal and stable weight and density(Fig.4).

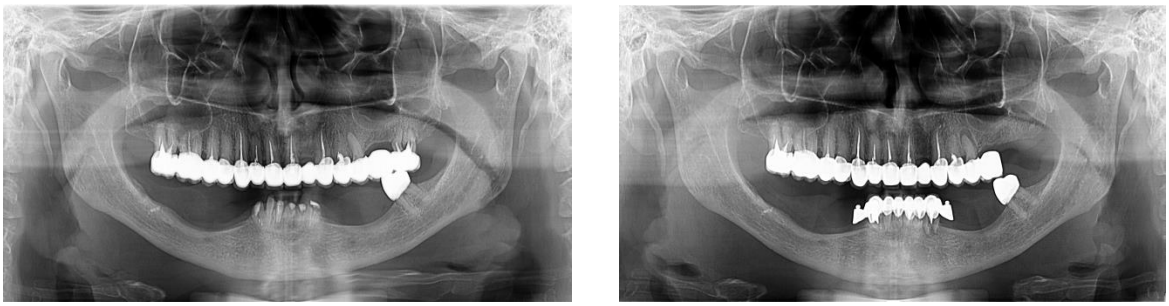

Fig. 4 Paraclinical aspects of bone resorption after two years

The fracture of partially removable skeletal prostheses was recorded in a percentage of 15%, the fracture of partially removable acrylic prostheses in a percentage of 44%, elastic prostheses fractured in a percentage of 8%, the fracture of wire crochets in a percentage of 23%, the fracture of cast crochets in a percentage of 10% of the cases(Fig.5).

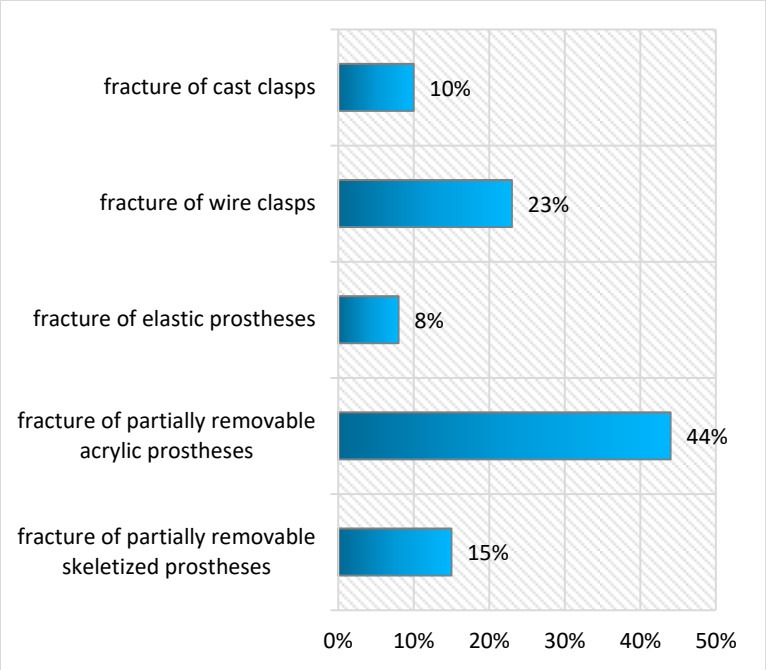

Fig. 5 Distribution of clinical cases according with the type of removable prostheses fracture

In most cases of partially removable skeletal prostheses, the fracture affected the acrylic component, the rarer cases involving the fracture of the metallic infrastructure, associated with bruxism.

Many of the negative echoes of partial removable prostheses on the oral health are related to aspects of the oral hygiene and a recent review by Cochrane focused on the aspect of hygiene of the dental prostheses, being unable though to identify the most efficient way of removing plaque from the prostheses(Fig.6).

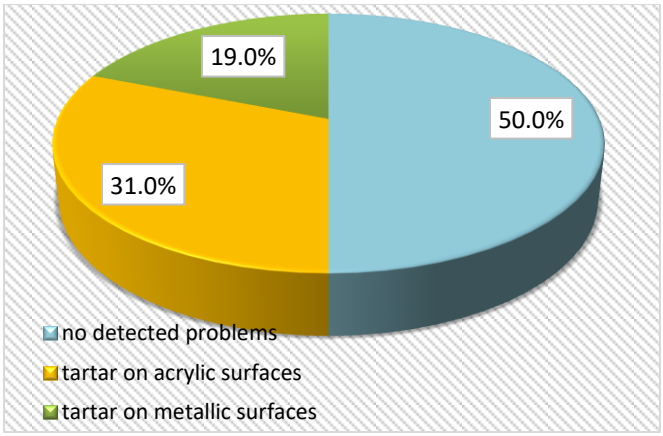

Fig.6. Correlative aspects between removable prostheses and oral hygiene

Indeed, an equivalent percentage of prostheses (31%) had plaque on the acrylate surface and 19% showed plaque on the metallic surfaces. Other studies similarly identified the fact that skeletal removable prostheses are prone to plaque accumulation and that was attributed to a lack of awareness on the part of the patients to maintain a good hygiene of the prostheses and the absence of regular checks. The patients' dexterity also yields eloquent results.

Local factors, such as skeletal partial removable prostheses, in conjunction with the patients' dexterity, which compromise oral hygiene and encourage the plaque formation, could increase susceptibility to periodontal diseases, especially at the level of the pillar teeth.

Radicular cavities were mainly observed and evidence for a direct relationship between the partial removable skeletal denture and the prevalence of radicular cavities is significant. Patients who wear partial removable dentures can be in particular more sensitive to radicular caries, even if they show reasonably good oral hygiene and it was reported that they show greater gingival retraction and more numerous radicular cavities, especially at the level of the pillar teeth, compared to the witness group.

Conclusions

Regardless of the benefits of partial skeletal removable prostheses regarding aspect and functionality, a series of studies showed a low acceptance and satisfaction level of the patients. The positive influences on the use of partial skeletal removable prostheses seem to be represented by the presence of a replacement of former teeth, the number of prosthetic teeth and the number of opposite posterior teeth.

As the population grows older, studies regarding oral health indicate an increase of the old adults with partial dentition. Planning oral health services will be a challenge for the professions in the dental medicine, with the impact of the increase of focus on dental unit loss on the subjective evaluation of patients of their own health and life quality. It is clear that the research in this field is not sufficient and that well-coordinated studies are necessary to address the impact of the use of partial skeletal removable prostheses on oral dental health.

References

1. Preshaw PM, Walls AW, Jakubovics NS, Moynihan PJ, Jepson NJ, Loewy Z. Association of removable partial denture use with oral and systemic health. J Dent. 2011;39:711–9.
2. Gimenez T, Braga MM, Raggio DP, Deery C, Ricketts DN, Mendes FM. Fluorescence-based methods for detecting caries lesions: Systematic review, meta-analysis and sources of heterogeneity. PLoS One. 2013;8:e60421.
3. Liu L, Zhang Y, Wu W, Cheng M, Li Y, Cheng R. Prevalence and correlates of dental caries in an elderly population in northeast China. PLoS One. 2013;8:e78723.
4. Ge X, Rodriguez R, Trinh M, Gunsolley J, Xu P. Oral microbiome of deep and shallow dental pockets in chronic periodontitis. PLoS One. 2013;8:e65520.

5. Coulthwaite L, Verran J. Potential pathogenic aspects of denture plaque. Br J Biomed Sci. 2007;64:180–9.
6. Dietrich T, Garcia RI. Associations between periodontal disease and systemic disease: Evaluating the strength of the evidence. J Periodontol. 2005;76(11 Suppl):2175–84.
7. Shaw JE, Sicree RA, Zimmet PZ. Global estimates of the prevalence of diabetes for 2010 and 2030. Diabetes Res Clin Pract. 2010;87:4–14.
8. Moore PA, Zgibor JC, Dasanayake AP. Diabetes: A growing epidemic of all ages. J Am Dent Assoc. 2003;134:11S–5S.
9. Felton DA. Edentulism and comorbid factors. J Prosthodont. 2009;18:88–96.
10. Daniluk T, Fiedoruk K, Sciepuk M, Zaremba ML, Rozkiewicz D, Cylwik-Rokicka D, et al. Aerobic bacteria in the oral cavity of patients with removable dentures. Adv Med Sci. 2006;51(Suppl 1):86–90.
11. Janket SJ, Surakka M, Jones JA, Lam A, Schnell RA, Rose LM, et al. Removable dental prostheses and cardiovascular survival: A 15-year follow-up study. J Dent. 2013;41:740–6.
12. Gendreau L, Loewy ZG. Epidemiology and etiology of denture stomatitis. J Prosthodont. 2011;20:251–60.