

THE IMPORTANCE OF ORAL FUNCTIONAL CHARACTERISTICS IN TREATMENT OF COMPLETELY EDENTULOUS PATIENT

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ABSTRACT

In complete edentulism treatment the most challenging objective is restoring patient's functionality, ensuring proper conditions for chewing, but also speaking and social interacting. In particular, mastication is a central parameter perceived by the patient as one of the most important function to ensure a good quality of life. The aim of this manuscript was to highlight some important factors related to oral functioning that should be considered when planning and implementing the treatment for complete edentulism with conventional or implant-based removable prosthesis, as being regarded as having a great impact on the treatment outcome.

Keywords: functional characteristics, complete edentulism, treatment, masticatory ability

INTRODUCTION

Complete edentulism is a „debilitating and irreversible condition“, which associate multiple anatomical and functional alterations, with negative impact on patient's wellbeing and quality of life. Despite the efforts made, this condition it is still well-represented especially in the aged, population segment that register nowadays an increase, that more frequently has oral and systemic comorbidities and poorer adaptation to new that sometimes contribute to increasing treatment difficulty.

Treatment of edentulism mainly targets restoring „the loss“ from an anatomical and functional perspective, the final goal being to ensure proper conditions for living a „normal life“ for the edentulous individual. Treatment outcome and prognosis is highly interrelated to acknowledgment of the functional characteristics. It is well known that in completely edentulous patient these are most relevant during prosthesis manufacturing, taking the impression and recording the maxillomandibular

relationship being highly dependable on them. The lack of balance between the prosthesis and functional characteristics can be related to complications, as ill-fitting removable dentures or implant complications in implant-based restorations. These can interfere with patient's satisfaction and wellbeing in general, with potential negative effect on his social functioning, but also with increased costs, in terms of financial and clinical time, needed to address them.

When considering oral functional characteristics most relevant are patient's features that are determinants of these aspects. Even so, prosthetic treatment itself can negatively induce functional alterations, through its deficiencies, e.g. ill-fitting dentures can be linked to abnormal movement patterns of the mandible; incorrect dentures are related to masticatory deficiencies. Therefore, both biological and treatment related factors may have an increased impact on oral functioning, and should be both considered.

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The aim of this manuscript was to highlight some important factors related to oral functioning that should be considered when planning and implementing the treatment for complete edentulism with conventional or implant-based removable prosthesis, as being regarded as having a great impact on the treatment outcome. The main aspects that should be taken into consideration, that promotes obtaining a good outcome in terms of oral functional rehabilitation, are mention in Table 1 and further on discussed.

TABLE 1. Oral functional rehabilitation related aspects to be considered for the treatment of edentulous aspects

Oral functional rehabilitation	
Treatment planning	<ul style="list-style-type: none"> – systemic status – oral status – morphological and functional – evaluation: <ul style="list-style-type: none"> • patient's chief complaint • clinical examination • paraclinical examination (e.g., panoramic and the lateral cephalometric radiographs; electromyography and kinesiography) • examination of the dentures to be replaced, if applied
Treatment conduct	<ul style="list-style-type: none"> – functional impression – registration of maxilla-mandibular relation – selection and mounting of the artificial teeth
Treatment prognosis and complications	<ul style="list-style-type: none"> – functional alterations may be related to complications of the oral, systemic or prosthesis alteration – prosthesis functionality influences patient's wellbeing and quality of life

ORAL FUNCTIONAL REHABILITATION – RELEVANT ASPECTS IN TREATMENT PLANNING

In order to accurately identify the functional characteristics of the patient, relevant for the outcome of the prosthetic rehabilitation, a well conducted anamnesis supplemented by a rigorous examination by clinical and paraclinical means can be at most importance.

From the first visit is important to establish a good communication with the patient, in order to identify *patient's chief complaint* regarding the dentures, which can be impaired masticatory function, poor esthetics, displacement of the denture while speaking or chewing, or other discomfort. Acknowledgment of them can give important clues toward identifying prostheses' deficiencies and manufacturing better prostheses, which more accurately respond to patient's need and expectations. Usually the poor functionality with the complete dentures, frequently claimed by the patients, can be addressed through interventions like managing the

deficiencies of the prosthesis, usage of denture adhesive or selecting implant based treatment alternatives, fixed or removable.

Edentulous patients are most often aged and have *multiple systemic comorbidities*, which may have a negative impact on the prosthetic treatment as medical conduct or degree of functional rehabilitation. Knowing the medical history, is a precursory condition for correlating the signs and symptoms of several diseases which can affect the alveolar processes, the mucosa, the muscle and denture control and those affecting saliva production, for implementation of individualized treatment with a good outcome. Moreover, it should be acknowledged that a poor prosthetic rehabilitation may negatively contribute to oral dysfunction with impact on systemic health (e.g., ill-fitting dentures associates alteration in chewing, which influences the eating behavior and may contribute to a poor nutritional status).

The state of complete edentulism implies severe *oral changes*, which considerably increases the difficulty of prosthetic rehabilitation and its functional outcome. Clinical examination is the most important element in diagnostic classification, respecting the morphological evaluation criteria for the maxilla and mandible, setting out the difficulty degree. The wide morphological variety should impose some clinical procedures established by clinical experience for a systematic approach of the treatment. For another point of view, oral status of patients with no anterior dentures is mainly favorable for denture conditions, especially for the removable ones, offering good prosthetic support on bearing area, stable mucosa with optimal thickness, favorable muscle insertion, which favors a better denture support and retention that promotes a proper functionality. In previous long time denture wearers usually there are encountered several unfavorable side effects on oral structures, which increase the difficulties of prosthetic rehabilitation, that must be compensate by advanced knowledge and practical skills of the dentist. The main effects are severe ridge resorption, fibrous and high resiliency mucosa, denture stomatitis and sometimes abnormal mandibular movement patterns.

Additional to the standard clinical evaluation, the *paraclinical means* can give important information, which can be related at some degree to the functional particularities of the patient. Among these there can be mentioned the standard panoramic and the lateral cephalometric radiographs which can offer relevant data for assessing patient's skeletal class, with relates to functional particulari-

ties. Electromyography and kinesiography can provide useful parameters for objective evaluation of the masticatory function and mandibular movements, aspect that can influence treatment planning (e.g., type of restoration – fixed or removable, conventional or implant based; occlusal scheme).

In previous denture wearers, examination of the *dentures to be replaced* represents a valid source of information for planning the future prosthesis, by acknowledgement of the manufacturing elements with influences on the oral functioning. Masticatory pattern of the patient, food or vicious habits, functional features can be assessed by analyzing the wearing pattern of the teeth. Even so, some objective deficiencies of the old dentures, which impairs functionality, may be due to their changes in time (e.g., decreased of vertical dimension consecutively to artificial tooth wear).

Acknowledgment of the degree of patient's satisfaction with previous prosthetic treatment alternative stands as a most relevant criteria in planning the future treatment alternative, the one that is most appropriate for each individual. Mainly the dentist must choose between conventional denture, and implant based restoration, fixed or removable. For the functional point of view, Ferrario et al. (2004) demonstrates that fixed implant prostheses and implant overdentures are rather equivalent. (8)

ORAL FUNCTIONAL CHARACTERISTICS "REPRODUCED" DURING TREATMENT CONDUCT

In order to obtain a functional results, especially in removable prosthesis, during some treatment phases, functional characteristics are somewhat "reproduced", used for obtaining a good denture support and retention.

The functional impression stage is of great importance in obtaining an accurate record of the functional bearing area for a good retention by a close fitting between the denture and supporting tissue. So far there were applied modified impression techniques like open and close mouth technique, dynamic and static techniques, technique to improve stability, like the neutral zone registration.

The *registration of maxilla-mandibular relations* is the most important stage of rehabilitation of functional features, in some clinical situations being more difficulties causing errors materialized as important functional deficiencies. In this process there are two accurate dimensions that must be determined, vertical dimension of occlusion and cen-

tric relation. In some cases patients can adopt habitual closure positions, this situation requiring further efforts to obtain a retread occlusal contact.

Particularly important in patient's appearance is the *selection and mounting of the artificial teeth*, satisfying the natural look and respecting the functional characteristic for a good compatibility of the denture and prevention of iatrogenic effects. Some arrangements of teeth are characteristic of specific jaw relationships, and for class II jaw relationship and class III relationships, the unfavorable interrelation ridge can displace the dentures along mandibular movements.

FUNCTIONALITY WITH THE PROSTHESIS, AS RELEVANT FACTOR FOR TREATMENT PROGNOSIS AND COMPLICATIONS

Altered prosthetic functionality negatively influences patient's satisfaction and health, being a risk factor for oral and systemic complications

The removable *prosthesis' lack of stability* creates the conditions of further complications, by affecting oral health, primary the mucosa which can suffer traumatic injuries, stomatitis or hyperplasic modifications. Additionally, ill-fitting dentures accelerates the rhythm of bone resorption, increasing the difficulty of future prosthetic rehabilitation

Chewing function decreases with age, in particular because of the resorption changes and complications on oral structures, which create difficulties in obtaining stable and functional dentures. Masticatory deficiency favorites a poor qualitative and quantitative nutrition, which can affect the general health of the patient. Incorrect denture, with poor stability or decreased efficiency related to artificial teeth wear, negatively influences mastication with the above consequences.

In case of overdentures on implants, the complications of unfunctional behavior of the dentures consist in *mechanical complications*, like fracture of the denture, increase resorption on adjacent peri-implant bone or loosening of the retentive value of the attachment systems.

Oral functionality is a relevant aspect for *patients' wellbeing and quality of life*. So functional deficiency will affect the general health and the oral health, patient's physic comfort, because of instability of the dentures generating stress condition, can affect social life and generally decrease the quality of life. Consequently, there can be seen nowadays an increased used of the implant overdentures, treatment alternative that compared to the conventional dentures are superior as functional

parameters, being implemented at rather acceptable biological, financial and clinical time costs. Considering the increased and increasing segment of the aged in general population, the projections that most probably edentulism will remain a rather frequent condition, treated most often by removable prosthesis, standardized treatment protocol and special training programs for prosthodontists should be implemented in order to ensure the condition for these patients to benefit of an active ageing process and a “normal” life in general.

CONCLUSION

In complete edentulism assessment of masticatory function and patient satisfaction are considered as treatment outcomes.

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