

# CHANGES IN THE MUSCULAR EQUILIBRIUM CAUSED BY A POORLY FITTING PROSTHESIS IN DENTURE WEARERS

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The stomatognathic system continuously adapts to new conditions and circumstances, this balance is a dynamic content in relation to age, growth, development and involution. Affecting of one component result in distortion of the system, while stimulating the re-balancing mechanisms, compensation, which sometimes fail to restore a balance, only poor. Therefore, our study was performed on a sample of 264 patients aged 40–85 years, seeking treatment for complex oral rehabilitation, establishing signs of muscle dysfunction and their incidence in patients with removable prostheses incorrectly adjusted at the prosthetic fields, represented by partial or complete edentations.

*Key words:* Muscle dysfunction; Edentation; Removable prosthesis.

## INTRODUCTION

The stomatology of the third millennium acquired new boundaries and dimensions, upshot of the development of the diagnosis and therapy, they themselves being influenced by the modern and complex technology and also by the psychosocial and communication aspects<sup>6</sup>.

The functionality of the stomatognathic system depends on many factors which can act on it in the direction of equilibrium and that can anytime be changed, adapting to new situations and circumstances<sup>2</sup>. Among the elements that play a role in the stomatognathic system's stability, a special place is held by the muscular factor, the dynamic constituent.

## PURPOSE

In this paper, the extended partial edentation or the complete edentation are looked in terms of the multiple systemic connections, both inner and outer, that are established between the elements of the stomatognathic system.<sup>1</sup> These connections are responsible for the way in which, the morphological or functional deterioration of one of the components will draw the alteration of all.

Therefore, in this paper we clinically establish the signs of muscular dysfunction and based on these information we get the incidence of orofacial muscular dysfunctions, in order to work out a complete treatment plan, pursuing to get a complex muscular rehabilitation.

## MATERIAL AND METHOD

The patients were chosen from those who came in our clinic to improve their dentures. They were 264, 128 men and 136 women. The average age was 58.7, the study being held on three groups of age: 40–55 years old, 55–70 years old and 70–85 years old (Table 1).

The patients we selected were complete, or partial edentated and they were prostheses wearers for 3 to 10 years. All patients were informed about this study and they consented to it (Table 2).

Table 1

Distribution of the patients according to their age and sex

Age	Men	Women	% Men	% Women
40–55	39	43	30.46	31.61
55–70	61	78	47.65	57.35
70–85	28	14	21.87	10.29
Total	128	136		

Table 2

Distribution of the patients according to their type of edentation

Age	E.P		C.E		E.P	C.E
	Men	Women	Men	Women	%	%
40-55	36	42	3	1	95.12	4.87
55-70	28	37	33	41	46.76	53.23
70-85	6	5	22	9	26.19	73.80
Total	70	84	58	51		

To each and every patient was elaborated a clinical report. They were thoroughly examined and so was every muscular group using the classic methods of inspection and palpation.

There were investigated the temporals, the masseters as muscles of mastication and the buccinators and the orbiculars as oro-facial ones.

The palpation was made by pressing smoothly the muscles insertion and tucking the muscles mass, both in movement and in rest.

During the postural position, the muscles are characterized by a light contraction, that can't be detected on the electromyography-muscular tonus of posture. This can vary depending on many other factors such as clinical, functional and morphological ones and it will be evaluated considering the relation between the muscles' osseous insertions and the postural tonus that exists<sup>4</sup>.

First we palpated the masseter and the temporal muscles-the osseous insertions and the masses and then we palpated the oro-facials muscles. Every muscle was examined equably on the right side and on the left. We assessed and wrote down in every patient medical report the trophicity of the muscles and their consistency. The muscular tonus was examined using Netter's tests<sup>8</sup>.

After the clinical exam of the muscles we examined the prostheses, assessing their the maintenance and stability using the following standards from Kapur evaluation:

0 – Maintenance – none at all. When it is inserted in the oral cavity is dislocate itself. Stability – none at all. It's tipping on the prosthetic field.

1 – Minimal maintenance. It has light maintenance when pulled vertically and the same or nothing at all when pull on side. Minimal stability. It's tipping moderately on the prosthetic field.

2 – Moderate maintenance when pulled vertically and the same or nothing at all when pull on side. Sufficient stability. It's lightly tipping or not tipping at all on the prosthetic field.

3 – Good maintenance. When pulled vertically has maximum maintenance and enough when side forces act. Good stability, without tipping.

The rating of the prostheses was made likewise:

- Minimal stability and maintenance - score < 6;
- Moderate stability and maintenance - score 6 – 8;
- Good stability and maintenance – score > 8.

## RESULTS AND DISCUSSIONS

After the clinical exam we found the following grades of tonicity of the masticatory muscles:

– at group of age between 40-55 with partial extended edentation from 78 cases: 22 of them had normal tonicity for masseters, 28 with normal tonicity for the temporals, 33 with normal tonicity for the orbiculars and 29 for the buccinators, 15 with hypertonicity for the masseters, 17 with hypertonicity for the temporals, 12 with hypertonicity for the orbiculars and 8 with buccinators hypertonicity and with hipotonicity we found 41 cases for masseters and temporals, 33 for the buccinators and the orbiculars (Fig. 1);

– at the same group of age but in case of complete edentation from 4 cases we found one case with normal tonicity in masseters, 2 cases in temporals and orbiculars and one with normal tonicity in buccinators (Fig. 2);

– at group of age between 55-70 with partial extended edentation from 65 cases: 12 of them had normal tonicity for masseters, 15 with normal tonicity for the temporals, 21 with normal tonicity for the orbiculars and 14 for the buccinators, 7 with hipertonicity for the masseters, 8 with hipertonicity for the temporals, 10 with hipertonicity for the orbiculars and 6 with buccinators hipertonicity and with hipotonicity we found 46 cases for masseters and 42 for temporals, 45 for the buccinators and 34 for the orbiculars (Fig. 3);

– at the same group of age but in case of complete edentation from 74 cases we found: 8 of them had normal tonicity for masseters, 10 with normal tonicity for the temporals, 13 with normal tonicity for the orbiculars and 8 for the buccinators, 3 with hipertonicity for the masseters, and the temporals, 4 with hipertonicity for the orbiculars and 1 with buccinators hipertonicity and with hipotonicity we found 63 cases for masseters and 61 for temporals, 64 for the buccinators and 57 for the orbiculars (Fig. 4);

– at group of age between 70-85 with partial extended edentation from 11 cases we found: 2 of them had normal tonicity for masseters and the temporals, 3 with normal tonicity for the orbiculars

and 2 for the buccinators, 3 with hipertonicity for the masseters and the temporals, 2 with hipertonicity for the orbiculars and 1 with buccinators hipertonic and with hipotonicity we found 6 cases for masseters, for temporals and for the orbiculars and 8 for the buccinators (Fig. 5);

– at the same group of age but in case of complete edentation from 31 cases we found: 3 of

them had normal tonicity for masseters and for the temporals, 2 with normal tonicity for the orbiculars and the buccinators, 1 with hipertonicity for the masseters, and the temporals and buccinators, 2 with hipertonicity for the orbiculars and with hipotonicity we found 27 cases for masseters ,for temporals and for the orbiculars, 28 for the buccinators (Fig. 6).

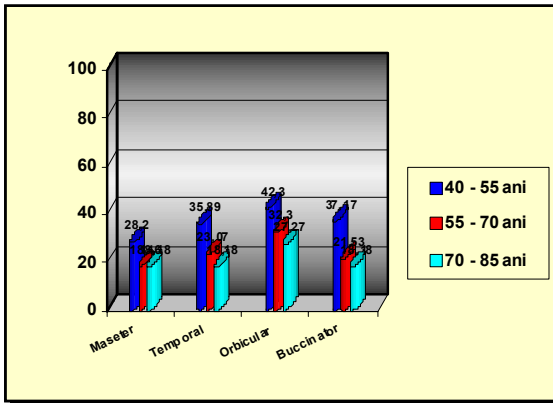


Fig. 1. Grades of tonicity of masticatory muscles – partial extended edentation.

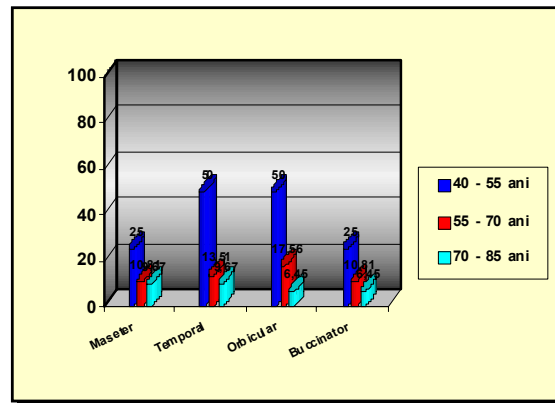


Fig. 2. Grades of tonicity of masticatory muscles – complete edentation.

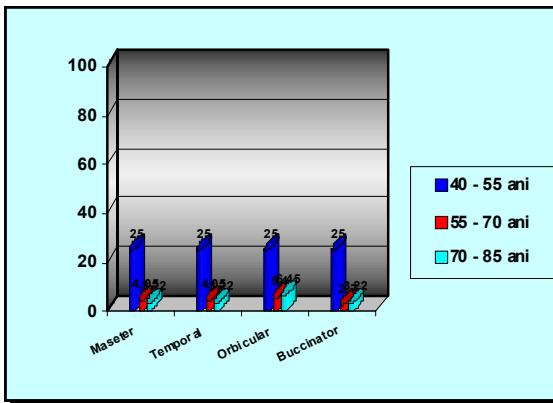


Fig. 3. Grades of tonicity of masticatory muscles – partial extended edentation.

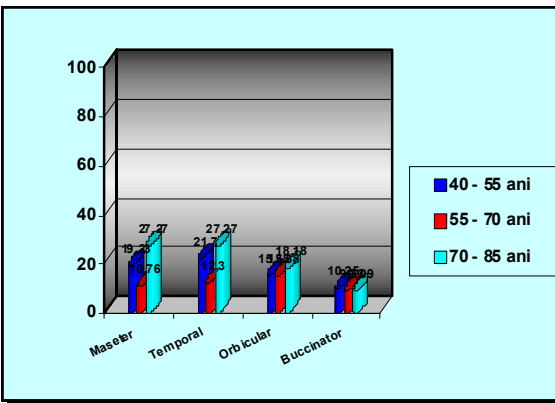


Fig. 4. Grades of tonicity of masticatory muscles – complete edentation.

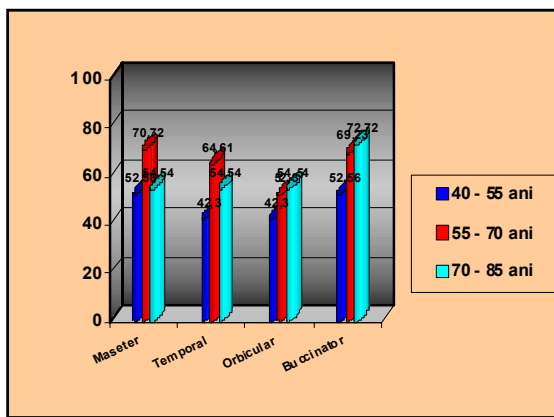


Fig. 5. Grades of tonicity of masticatory muscles – partial extended edentation.

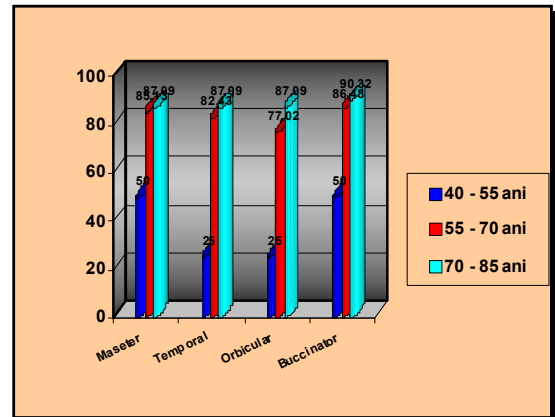


Fig. 6. Grades of tonicity of masticatory muscles – complete edentation.

## CONCLUSIONS

1. Between the morphological bone structure and the muscles of the stomatognathic system there is not an equilibrium, always changing according to the adaptation of the two systems, the muscular activity being directly influenced by the integrity of every element of the stomatognathic system

2. The dishomeostasis of the stomatognathic system as a result of edentation is just a step on the way of this complex disease, the changes that took place being irreversible. Therefore, the group of muscles affected can influence the relationships between the two maxilla and can also change the mandible's movements in old wearers of prostheses.

3. The great variety of the stomatognathic system's changes as a result of edentation and ageing requires a thorough investigation of each and every case, in order to track down as soon as possible every muscular dysfunction.

4. All patients found during the clinical exam to have a muscular disorder must be investigated to set up a complex treatment, monitored even after the prostheses would be over

5. As a result of the clinical investigations, we determined a high rate of muscular dysfunction in the group of old wearers, with the stability and maintenance of the prostheses affected. The dysfunction was asserted by means of hyper and hypotonicity of the muscular masses. In the group

of recently edentated patients the changes were less visible than in the group of old wearers, in which the body tried to adjust to the edentation. We also found muscles that weren't yet affected by the changes of the stomatognathic system.

6. The change of the muscular tonus is a sign and symptom that leads us to a diagnosis of muscular dysfunction and it is an element that will influence the prosthodontic treatment.

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