

Abstract of the PhD thesis:  
**Researches regarding some prosthetic devices used in the treatment of cranio-  
mandibular dysfunctions and of associated clinical entities**

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In the therapy of cranio-mandibular dysfunction, as well as some clinical entities associated with it like bruxism or respiratory disorders linked to sleep, one of the most used methods is the interceptive therapy with occlusal devices. Occlusal devices are a key element of the therapeutical approach on some orofacial disorders like light and medium forms of respiratory disorders linked to sleep.

In the **first part** of this PhD (the general part) the specialized literature has been reviewed regarding the aim of the interceptive therapy and of the occlusal interceptors, use objectives, systematization and main characteristics of the occlusal interceptors. The clinical efficiency of these oral appliances on reducing the light and moderate symptomatology and especially the pain , by eliminating the occlusal interferences, modifying the mandibular condil-glenoid cavity relations, lengthening the muscular fibers, is also presented. The literature in recent years reveals that occlusal devices used to treat cranio-mandibular dysfunctions act rather as a behavioral therapy than a mechanical therapy.

The **second part** of the thesis (special part) includes personal research which resulted in 4 studies:

The first study aims to assess, using electromyography, the immediate changes that occur in the activity of masticatory muscles when applying resilient or hard splints, to establish criteria for the selection of an appropriate occlusal device. In this study 7 patients were involved, each receiving two splints: a hard one and a resilient one. The splints were adjusted in order to obtain a stable occlusion. The contractions of the anterior temporal and masseter muscles were electromyographically recorded without the splint, with the resilient one and with the hard one, in centric relation and in deglutition. The results show that there are no significant changes in electromyographic activity of masticatory muscles immediately after

insertion of the resilient splint or the hard one. The therapeutic activity of these devices is setting up after a longer period of time.

The second study shows electromyographically and posturologically the immediate effect of the Aqualizer® device application on postural balance and on masticatory muscles. The study involved 15 subjects evaluated for postural balance with two symmetrically calibrated Bosch scales before and after the Aqualizer® insertion. Then, electromyographic activities of masseter and anterior temporal muscles were recorded at rest and during moderate isometric contraction, before and immediately after the insertion of the Aqualizer® device. Although the results for the whole group are not statistically significant, there was a significant improvement in masticatory muscle activity, both at rest and centric relation, and postural balance.

The **third study** of this thesis is composed of two parts. The first part aims to assess treatment needs in mild to moderate sleep-related breathing disorders with Epworth Sleepiness Scale questionnaire(ESS). After obtaining the right to use this questionnaire, a group of 100 patients was included in the study. The results show that the Epworth Sleepiness Scale is a solid questionnaire that is internally consistent and can be used in population studies and can identify patients with excessive daytime sleepiness thus recommending oral devices for therapy. The second part of the study is to assess the radiological changes of hyoid bone and upper airway dimensions as a consequence of use of oral devices for improving sleep-related breathing disorders. We used two lateral cephalometric radiographs of a patient, man of 31 years dentated, with BMI 36.6 and ESS questionnaire score = 12. The first scan was made in centric relation position and the second one with the mandibular advancement device placed in the oral cavity; then radiographs were analyzed by identifying bone and soft tissues marks. The results showed that the protrusion of the mandible, in this case, produced a decrease in respiratory nasopharyngeal space, which confirms that the mandibular advancement devices are not effective therapy for the obese patient.

In the **last study** a clinical case, with the use of maxillary stabilization splint in implant-prosthetic rehabilitation, is presented. The patient presents myogenic craniomandibular dysfunctional symptomatology. In this case the occlusal interceptor is used not only as a means of deprogramming, but repositioning and supportive structure for positional occlusion records.

The general conclusions of this thesis are grouped into four paragraphs, corresponding to the four studies.

Chapter *References* comprises a total of 129 bibliographic titles and chapter *Appendixes* include scientific papers published in extenso resulted from doctoral research, user agreement of the Epworth Sleepiness Scale questionnaire.

**Keywords:** craniomandibular dysfunction, electromyography, Aqualizer<sup>®</sup>, splint, masticatory muscles