

Doctoral thesis abstract

Clinical and experimental researches on semiadjustable articulators

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Articulators are complex mechanical instruments enabling simulation of occlusal jaw movements as well as registration and transfer of specific data and important intermaxillary relations. Semiadjustable articulators are indispensable in the manufacture of mobile and fixed prosthetic restorations to match in terms of functional occlusal both statically and dynamically.

The thesis is divided into a general part in which the current state of knowledge is presented and a special part of personal contributions consisting on five experimental and clinical studies.

The general part of this thesis consists of six chapters that summarize the literature about the dental articulators and their use in complex prosthetic rehabilitation. It also provides information on facebows transfer, mechanical and electronic axiography and programming articulators.

The personal part of the thesis is divided in five lines of research: a statistical study, clinical and experimental studies on semiadjustable articulators.

The purpose of the thesis consist of several lines of research addressing theoretical and applied importance, dental articulators capacity to ensure reproduction as close to reality of the mandibular movements and its determinants in order to obtain high quality prosthetic oral rehabilitation.

The first study, entitled **Statistical study on the use of articulators on dental practice** was conducted using an anonymously questionnaire on own conception, which we distributed on-line to practitioners through several Colleges of Dentists in Romania. The general objectives of the study were to determine the extent to which practitioners use various types of dental simulators and facebow and to find out on what types of prosthetic rehabilitation the articulators in dental practice are used. The results of the study show that despite progress of the contemporary dentistry, in

current practice the use of simulators is limited. Dentists report that usually do not use articulators in prosthetic rehabilitation, preferring to use alternative easier techniques, like the ocludator.

The second study is entitled **The reproducibility of two facebow registration**. The aim of this study is to compare the reproducibility of the records made with two facebow, one pretragian fastening and another ear fixing. The results obtained show that both types of facebow records are sufficiently reproducible to ensure a precise assembly the maxilar model in the upper jaw arm of the articulator, but their attachment remains arbitrary. A higher accuracy can be conferred only by the use of cinematic arc, part of the axiograph.

The third study **Mechanical versus electronic axiography: a clinical study** was conducted on a group of 8 people that were made mechanical and computerized axiography records. Based on this study it was shown that the values obtained on the sagittal and transversal condylar paths are close together for the two types of axiography. Both devices are equally useful in determining the terminal hinge axis, necessary in the correct positioning of the facebow.

The fourth study, **A study on the mandibular arc of closure reproducibility using the computerized occlusal analysis system** aims to answer the question how accurately the various types of simulators are able to reproduce mandibular movements and especially the closing path of the mouth. The research was conducted using a computerized analysis system. The results showed that non- ARCON semiadjustable articulator reproduces more accurately the occlusal contacts in the mouth and computerized analysis system T -Scan III turns out to be not only an important tool for occlusal diagnosis *in vivo*, but also a very useful device to address the occlusion on *in vitro* experimental studies.

The fifth experimental study entitled **Vertical discrepancies on mounting casts in the articulator caused by various interocclusal recording materials** has as main objective to determine if there are differences in the vertical spatial positioning of the models in the articulator consecutive dimensional changes in time of interocclusal records with different materials used for this technique and hence the degree of reproducibility in articulator of the clinical situation recorded. Based on this, the study has demonstrated that there are no significant clinical differences on positioning the models in articulator, at the interocclusal records. Each of occlusal registration materials used allows programming of the articulator with accuracy and the records are sufficiently reproducible. The results also suggest that the records are more accurate and reproducible as the layer of the interocclusal recording material is thinner.

Keywords: semiadjustable articulator, facebow, axiography, prosthetic rehabilitation