

THE ADVANTAGES OF MOUNTING IN SEMI-ADAPTABLE ARTICULATORS IN DENTAL PROSTHETICS

Călin Mancaș, Paul Freiman, Teodora Eva Lupulescu, Tatiana Duminica

Department of Dental Medicine, Faculty of Medicine, Pharmacy and Dentistry,

Vasile Goldis Western University of Arad

ABSTRACT : After defining and classifying simulators of the dento-maxillary apparatus, the paper presents a few characteristics of semi-adaptable (semi-adjustable) articulators. It then details the technical stages of the transfer of reference points to the face bow and the mounting of models in the articulator.

KEY WORDS: dental prostheses, simulators, articulator, face bow, mounting.

Introduction

While in mobile prosthetics an occlusor is the simulator preferred by most dental technicians, in fixed prosthetics it is the mean-value (non-programmable) articulator, with all the errors that this type of simulator yields (failure to observe fixture times, incorrect placement of the lower model, lack of support for the occlusal plate during fixture, etc.). This is why we tried to show, by means of this paper, the advantages of using a semi-adaptable articulator in a fixed prosthetic work, even if it entails more working stages.

Materials and methods

In this paper we presented the use of a semi-adaptable articulator in making a fixed prosthetic work. We used a semi-adaptable ARTEX CR articulator and an ARTEX face bow. We shall only refer to the actual mounting in the simulator.

Dental prostheses are made on partial or total models, corresponding to the jaw or mandible, positioned in relation to the antagonistic arcade or hemiarcade model. While constructing prostheses, the two models must be in an identical position to the physiological one in which the mandible is in relation to the jaw. Models are positioned in apparatuses built in a similar fashion to the dento – maxillary apparatus which they more or less imitate.

Definition: simulators of the stomatognathic system or the temporo–mandibular joint are instruments that reproduce, more or less, the movements of the mandible, or, more precisely, certain mechanical conditions of these movements.

Simulators of the dento-maxillary apparatus must meet a series of basic conditions (according to D. Bratu, 2003):

- To faithfully reproduce the horizontal relation of models;
- To faithfully reproduce the vertical relation of models;
- To be equipped with a positive anterior stop (incisal stylet);
- To allow the acquisition of records made with a transfer face bow;
- To provide the possibility of opening – closing– rotation movements around the hinge axis (pure rotation axis);
- To allow propulsion and laterality movements;
- To allow mobile parts to be moved freely, without obstacles, and to be adequately conformed (ergonomic design);
- Immobile components must be rigid.

Their classification according to functionality and the capacity to simulate movements of the mandible distinguishes:

- Navarro's classification, which divides them into:
 - Non-programmable articulators;
 - Partially programmable articulators;
 - Programmable articulators.
- Ash and Ramfjord's classification:
 - Simple articulators (occlusors);
 - Mean-value, non-programmable articulators;
 - Partially programmable articulators;
 - Individual, fully programmable articulators.

The authors believe that the last two groups can be included in the same category of programmable articulators, as no simulator can be fully programmable.

In relation to their construction, there are two types:

- The ARCON type – it imitates the anatomical joint, the articular condyle being located in the lower part of the articulator;
- The NON-ARCON type – the articular condyle is located in the upper part of the apparatus.

Partially programmable (semi-adjustable, semi-adaptable articulators)

These have the following individually adjustable values:

- Inclination of the retro-incisive slope (anterior handle);
- Inclination of the articular tubercle slope;
- Distance from the inter-incisive point to the axis of pure rotation;
- Bennett angle.

Depending on the value of the apparatus, one can also adjust:

- the symphyseal angle;
- the orientation of the occlusion plane according to reference points.

The apparatus is adjusted based on data obtained from clinical examinations and functional determinations using a face bow. These face bows were designed to allow recording and transferring into the articulator the position of the upper model in relation to the hinge axis, which must be the one the upper jaw has with respect to the temporomandibular joint. Overall, three types of partially programmable articulators can be distinguished:

- Type I – protrusion and laterality movements are linear, since the articular tubercle slope is flat, unlike the natural joint, where we have curved paths.
- Type II – the articular tubercle slope has a curved conformation, in both the sagittal plane and in the frontal and horizontal ones. Thus, protrusion and mediotrusion movements will have closer trajectories to those of the patient.
- Type III – they have rigid articular boxes, generally cut from acrylate blocks, according to the patient's individualized data.

ARTEX simulators are individual, partially programmable articulators, some being of the ARCON type (AN model), others of the NON-ARCON type (TS model). The model we used is of the ARCON type, which consists of:

- ✓ A mechanism blocking condyles in centric position, which secures fixture of the upper arm, allowing free rotation movements;
- ✓ The possibility of opening the upper arm at 180 degrees and even more, which means it can be supported on the work table, like non-arcon articulators. Additional features, compared to other articulators, include:
 - ✓ Aiding mechanisms to program the propulsive movement fixed to the upper arm, which allows smooth rendering of the mandible's uni- and/or bilateral propulsive movement;
 - ✓ Aiding devices for fixture to the lower arm, allowing individual, separate modification for each part of the vertical occlusion dimension in which the condyles are positioned.

Mounting models in the articulator requires the following actions:

- Preliminary study on the determination of cranio-maxillary reference points;
- Transfer of determined reference points to the articulator, using a face bow.

The technique for transfer to the articulator consists of the following:

- ✓ Molding the two working models. They were made with mobilizable abutments using the Accu Trac system, which is a fast, efficient, precise and economic method for achieving a model with mobilizable abutments. (Fig. 1. and fig. 2.)



Fig. 1. Upper model

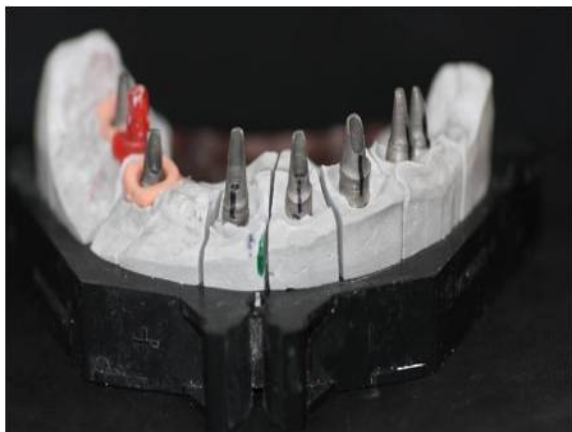


Fig. 2. Lower model

- ✓ Recording the jaw's position in relation to the hinge axis of the skull using an ARTEX face bow. (Fig. 3.)



Fig. 3. Artex face bow

- ✓ Detaching the fork from the frame of the face bow and fixing it to the transfer table using the hinge. (Fig. 4.)



Fig. 4. Mounting the fork on the transfer table

- ✓ Gypsum of a creamy consistency is deposited on the transfer bed. (Fig. 5.)



Fig. 5. Deposition of gypsum

- ✓ Lowering the fork to the level of the transfer bed. (Fig. 6.)



Fig. 6. Fixing the fork

- ✓ The transfer bed is positioned on the lower arm of the articulator and gypsum is deposited on the basis of the upper model. (Fig. 7.)



Fig. 7. Preparing the upper arm

- ✓ Using the record of the centric occlusion (with occlusion wax), the upper model is plastered with gypsum. (Fig. 8.)

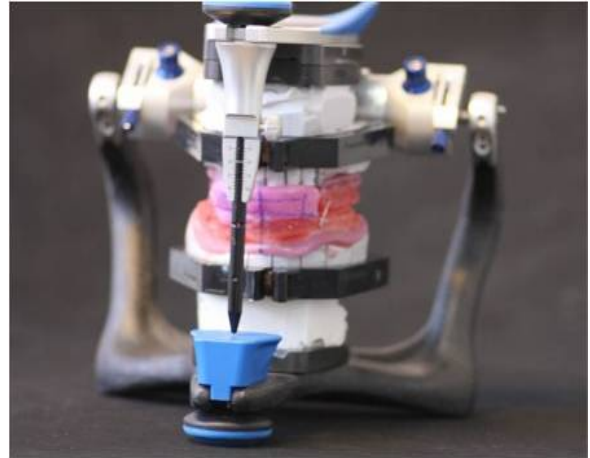


Fig. 8. Fixing the upper model

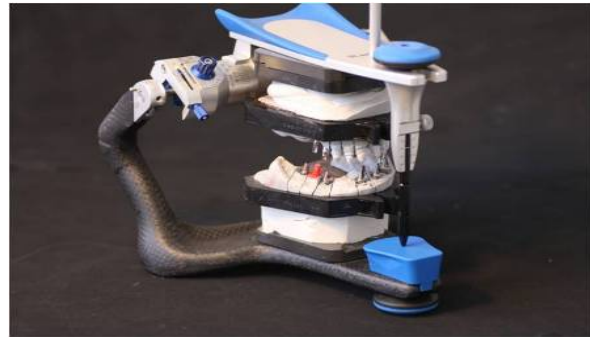


Fig. 9. Models in a relation of occlusion – lateral norm

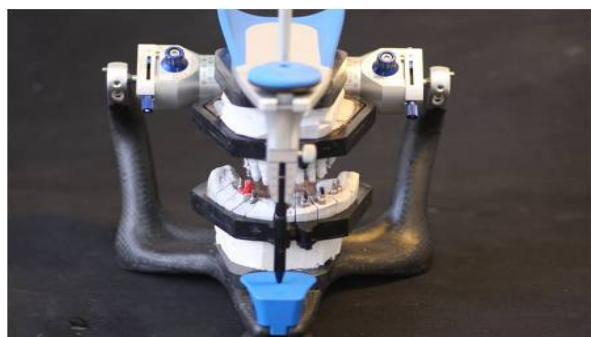


Fig. 10. Models in a relation of occlusion – frontal norm

Conclusion

The occlusion is certainly the common theme of all dental branches, but the occlusal concepts followed by practitioners in certain fields tend to be contradictory.

Perhaps the best occlusion is that which adapts over time to the functional changes. Of course the occlusion plane also fits in this scheme.

Mounting in the semi-adaptable articulator leads to the obtainment of prosthetic works that are very close to the real situation occurring in the oral cavity, subsequent adjustment being minimal or even absent.

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