Esthetic and functional treatment with implant-supported bar on an incongruous prosthesis carrier

Quick lab work creates complete-denture retention system on implants

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Introduction
The patient, a 74-year-old female with an older, total prosthesis, asked us to improve esthetics and function of both the upper and lower prostheses. In the initial exam, we noticed a marked difference between the total upper prosthesis (all but ruined) and the lower total prosthesis (recently manufactured across four implants). We also saw immediately that the prosthesis was incorrectly mounted, occupying too much space and leaving the teeth too exposed (Fig. 1).

After discussions with the patient, we agreed to remount both the upper and lower teeth to obtain optimal esthetic results and restore mastication function. Based on the specific demands of the case, we identified the best retentive-connection system to connect with the implants and provide the necessary over-structure, support and thickness.

Case planning
Impressions were taken to obtain vertical and centric dimensions. Once the design met the patient’s need for improved esthetics and function, the dental technicians created vestibular and lingual silicon masks to guide the building of the structure and over-structure. Space availability was evaluated with teeth and implants position. These analyses enabled identification of the proper prosthetic treatment to choose.

A working model was placed under the

Fig. 1: Patient during first clinical session. Photos/Carlo Borromeo

Fig. 2: Positioning of the OT Bar.

Fig. 3: Checking of the dimensions using the vestibular plaque.

Fig. 4: Check of the precision of the bar on the model before finishing.

Fig. 5: Check of the spaces for pipe cleaner.

Fig. 6: Superstructure completed on model.

Fig. 7: Spruing of superstructure on model.

Fig. 8: Re-application of teeth using plaques.

Fig. 9: Positioning of model in the mitten for creation of a resin-made prosthesis.
parallelometer to identify the proper insertion plan. Different aspects were evaluated: the horizontal line of the incisors, the occlusion line of the posteriors, the under spaces by the areas under the frontal ridge and the implants’ angulation. Once the insertion plan was finalized, castable pivots were regulated with proper height and screwed, guided by the silicon mask. Next came creation of the castable bar by setting it — area after area — using resin to fix it at the external areas (Fig. 2).

Starting the sprue procedure
Once all the parts of the structure were connected, we regulated the areas over the implants using a two-degree bur. The technician then checked everything using the silicon masks (Fig. 3). After we confirmed that the bar met all our expectations, we started the sprue procedure. We proceeded with the fusion through a special press-fusion procedure.

Once it was verified that the bar respected all the desired characteristics, we continued with the spraying, directly on the model to avoid distortions during the cooling of the wax. We then proceeded with the melting, using the “die-casting” technique. We conducted a first test immediately after cleaning the coating (Fig. 4).

Delivery of finished artifact to completion of final prosthesis
The finished artifact was delivered to the clinic, where the necessary tests and radiographs were obtained. Once verified that all the parameters were correct and that the structure was passive, the bar was milled and polished at the lab. On the model, spaces were verified for the application of pipe cleaners. This same test would be conducted later in the patient’s mouth (Fig. 5).

Using the silicon plaques, we built the superstructure directly on the bar, starting by positioning the containers of the caps. Castable boxes were applied onto those, always using the silicon plaques. After avoiding the undercuts with wax, we isolated the bar and the model and then built the superstructure using resin (Fig. 6). We removed it from the superstructure and pasted the retentions. Everything was set up to proceed with the spraying directly on the model (Fig. 7).

After the coating was melted off, precision and friction were verified using a revealing paint on the bar. The teeth were applied with the aid of silicon masks (Figs. 8, 9). The containers of the clips continued to be replaced with pink caps.

Everything was delivered to the clinic for the final test. With the prosthesis back at the laboratory, wax fittings were converted to resin fittings and the superstructure was finished and polished (Fig. 10). After applying it again on the superstructure, undercuts were closed with some wax, and the resin was applied to the prosthesis (Fig. 11). All the components of the prosthesis were polished and delivered to the clinic for the final test (Figs. 12, 13).

Conclusions
With adequate components, retention systems on implants and readily available technical and clinical knowledge and resources on complete dentures, you can obtain excellent results in short work times, using both traditional systems and CAD/CAM.