Prosthesis rehabilitation achieved despite need to use damaged spherical abutments

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For more than 20 years, the 70-year-old female patient had used a total upper prosthesis along with a lower prosthesis that was supported by two spherical metal abutments attached to retentive titanium. She came to the clinic for restoration of the two prostheses, both of which had been extensively damaged by many years of use. Additionally, the attachments, constructed of gold, had lost all retention ability. In the initial exam, extensive damage was noted with the attachment spheres (Fig. 1).

But to contain costs, the patient requested that the spheres not be replaced. So the spheres’ diameters were measured, and an individual impression carrier was constructed to obtain the definitive impression and the registration.

Once the teeth montage was completed, function and esthetics were established (Fig. 2). Lingual and vestibular (Fig. 3) silicon masks were built. The silicon masks provide useful indications in choosing the proper box for the retentive caps and for evaluating if there is enough space to build a metal structure to make the prosthesis more stable and resistant.

It was decided to use Rhein’83 elastic caps, which proved to be perfectly compatible with the spherical abutment diameters and enabled personalization of the prosthesis by creating elastic retention suitable to this specific case.

The reinforcement structure was constructed by using wax in the space between the tissues. The retentive caps were adapted over the spherical abutments and surrounding area, enabling isolation of a defined space where the two castable boxes for caps positioners could be placed.

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**Fig. 1: Damaged attachment spheres.**

**Fig. 2: Lower teeth montage.**

**Fig. 3: Occlusal view of the model with silicon vestibular mask.**

**Fig. 4: Space creation using wax. Attachments zone isolation. Position rings insertion over the spheres with Ot Box Classic boxes in position.**

**Fig. 5: Space analysis using vestibular masks.**

**Fig. 6: Structure building with vestibular masks.**

**Fig. 7: Completed structure using vestibular mask, before sprue procedure.**

**Fig. 8: Fusion testing on the model after sprue procedure and investment removal.**

**Fig. 9: Metal structure testing following the cleaning process.**

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in position (Fig. 4). After the Ot Box Classic boxes were placed in position, the available space was measured to complete the procedure with the lingual and vestibular masks (Fig. 5). The Ot Box Special boxes were then tested together with the masks to determine if adequate space remained available.

Once it was decided to use the Ot Box Special with the connectors, the castable components were connected with resin to create the structure using the silicon masks (Fig. 6). After the structure was completed, sprue followed, keeping the structure over the model (Fig. 7).

The sprue procedure was completed using castable pivots and a special metal stabilizing bar. Removal of the special bar from the model was completed after a fusion and investment procedure. The structure was cleared from the investment (Fig. 8). Then, to verify that the procedure was successful, a test was run over the model (Fig. 9). The structure was cleaned and modeled, and the retentive components were inserted and tested over the model (Figs. 10, 11). The masks were used again to reconfirm that the available space was sufficient (Figs. 12, 13). Modeling proceeded once the opaque process was completed (Fig. 14).

Use of the Rhein’83 special tool for the retentive caps insertion enabled a simple and safe insertion of the proper prosthetic components (Figs. 15, 16). The general structure was now completed and ready to be delivered to the clinic (Fig. 17). Once the test inside the oral cavity was completed, the pink retentive caps were replaced with the reduced-diameter green caps (Fig. 18) to improve the retention — providing optimal stability to the prosthesis and a better sense of comfort to the patient.

As mentioned, the initial situation was functionally compromised by the retentive components. But the quality of the repair materials enabled optimal final results, both esthetically and functionally. Time and costs were reduced thanks to proper use of the Rhein’83 solutions. The castable cap boxes were fundamental for the procedure and for the construction of the bar. The components satisfied the patient’s and dentist’s expectations. Proper use of the Rhein’83 components added a relevant value to the dental laboratory work.

CARLO BORROMEO founded Dental Laboratory Borromeo in Italy in 1988, specializing in the construction of prosthesis for implants using CAD/CAM. He collaborates with Nobel Biocare Procera, Dental Wings, Rhein’83 and other companies to improve his expertise with their materials. He is a highly published industry author and presents and participates in many dental lab courses and conferences.