

Unique Approach to a Difficult Case

Rhein83 uses CAD technology to repair an implant-retained denture case.

By T.G. Hornisher, CDT

In a 2004 article¹ that involved an implant bar case (Figure 1 and Figure 2), the difficulties centered on unidentified implants and a worn implant bar cast from an unidentified alloy. At that time, the chosen solution was to re-mill the bar, cast spherical attachments and phaser weld to this mystery bar. This solution worked for several years, although the patient experienced some breakage as the denture teeth wore down. When the time approached for refurbishing the implant-retained denture, the patient chose to find a new restoring dentist and explore other alternatives that would present fewer problems.

The clinician and technician discussed several restorative options for this case. They decided to fabricate a new denture with stud-type attachments. However, after calling several implant and attachment companies, no attachment could be found that was compatible with the unidentified implant thread pitch and length. Understanding that acrylic gets its strength in mass, the technician wanted to provide as much inter-ridge space as possible. Because the patient placed much force on the appliance, she required a fairly secure denture.

After many inquiries, the technician received a call from Rhein83 USA with a solution. The model would be shipped to the Rhein83 facility in Italy. There they would scan the case and attempt to CAD/CAM mill the Rhein83 Equator abutments (www.rhein83usa.com) to match the unidentified implant thread pitch and length.

Using CAD technology, Rhein83

configured the actual retentive portion of the attachment (Figure 3). The case was milled and the custom abutment was completed (Figure 4). These are the shortest stud type of their class. Initially only four abutments were milled. Later, the restoring team decided that two more were needed. Using the same CAD-stored data file, Rhein83 milled two more. The custom abutments were delivered and an impression was taken (Figure 5).

Prior to this, the restoring team was able to customize three cover screws. The case was then facebow-mounted on a Denar Combi articulator (Whip Mix Corp, www.whipmix.com) and set up using the principles of replicating the anterior esthetics with lingualized posterior occlusion (Figure 6). This posterior occlusal scheme is extremely important, particularly with implant cases.

Since it was understood that mutually protected occlusion is difficult and time-consuming to fabricate, fit, and maintain, alternative occlusal schemes were suggested. Lingualized occlusion was recommended for the restoration of this full-arch dental implant case (Figure 7). The objectives of lingualized occlusion are the same, but offer the major benefits of the ease with which it can be established and maintained as well as the ability to direct occlusal loads axially onto the supporting dental implants.

Lingualized occlusion is the preferred solution for tissue- and implant-borne overdentures. The penetration of the bolus of the food is accomplished with less occlusal force and the opposing incline surfaces of the tooth provide bucco-lingual stability and eliminate

the potential for lateral interferences in excursive movements.² In short, implants do very well with vertical loads, but perform poorly with continued lateral stresses (Figure 8).

After the patient and restoring clinician approved the case, it was flaked using the Palajet® Duoflask (Heraeus Kulzer, www.heraeus-dental-us.com). The Duoflask allowed the technician to process two prostheses simultaneously (Figure 9). Note that the Fiber Bar (Preat Corp, www.preat.com) was used in the anterior region to add extra strength to the prosthesis in order to eliminate past issues with breakage. The case was injected with Palajet acrylic (Heraeus Kulzer) for its tissue adaptation qualities and strength. A moderate tinting of the denture base was included, and the attachment caps were processed along with the case.

The Equator abutments (Figure 10) come with a series of retentive caps. The pink caps were used in this case because four attachments were to be activated (Figure 11). Figure 12 and Figure 13 show the before and after images of this case.

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References

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Fig 1. and Fig 2. The difficulties in the implant bar case centered on unidentified implants and a worn implant bar cast from an unidentified alloy.



Fig 1.



Fig 2.



Fig 3.



Fig 4.



Fig 5.



Fig 6.



Fig 7.



Fig 8.



Fig 9.



Fig 10.



Fig 11.



Fig 12.



Fig 13.

Fig 3. The case was scanned at the Rhein83 facility in Italy, and they attempted to CAD/CAM mill the Rhein83 Equator abutments. Using CAD technology, Rhein83 configured the actual retentive portion of the attachment.

Fig 4. The case was milled and the custom abutment was completed.

Fig 5. The custom abutments were delivered and an impression was taken.

Fig 6. The case was facebow-mounted on a Denar Combi articulator and set up using the principles of replicating the anterior esthetics with lingualized posterior occlusion

Fig 7. Lingualized occlusion was recommended for the restoration of this full-arch dental implant case.

Fig 8. Implants do very well with vertical loads, but perform poorly with continued lateral stresses.

Fig 9. The Duoflask allowed the technician to process two prostheses simultaneously.

Fig 10. Intraoral placement of equators

Fig 11. The pink caps were used in this case because four attachments were to be activated.

Fig 12. A view of the patient's smile before.

Fig 13. A view of the patient's smile after.