Step by Step

Repaired Denture Success through Efficiency and Timeliness

Finding complete dental team satisfaction through revolutionary time-saving technology.

By Matthew Hotelling, CDT

Turnaround times on partial denture repairs are always a challenge for the laboratory. Patient satisfaction relies on the quality of the repair as well as the speed with which the appliance is returned back to them. Fortunately, laboratory technicians are now able to use the newest time-saving tools from Primotec USA.

A maxillary partial case with a broken clasp arm was received in the laboratory (Figure 1). The patient complained of excessive retention, as there was a larger mesial–buccal undercut. A ring clasp was prescribed to replace the Akers clasp assembly of tooth No. 14. This case was promised same-day delivery; therefore, the laboratory's material choice and technique was of the utmost importance for the success of the case. Using Primotec's Metacon light-cure wax system and a phaser welder ensured that this case was done properly and efficiently to make the deadline.

LABORATORY PROCEDURES

To prepare the partial for the new clasp, the old clasp arms were carefully removed with a cut-off disk and carbides. The mesial–occlusal rest remained, with a portion of the reciprocating arm, to weld to the surface area (Figure 2). The ring clasp was fabricated using the Primotec Metacon light-cured wax system. These smooth, preformed, light-cured wax patterns are designed for all clasps, bars, sprues, and sheets (Figure 3). The waxed-up clasp pattern was placed in the Metalight Classic light-curing unit, which uses a low polymerization temperature. After light-curing the pattern handled like acrylic and could be ground on if needed. Additionally, the pattern could be added with the use of a syringable, light-cured metablue material. A sprue form was included in the design and invested (Figure 4). The casting result was clean and smooth, with no problem burning out (Figure 5).

The welding process proved fast and effective with the use of the Primotec phaser welder MX2 (Figure 6). This pulsed micro arc-welder applied a precise weld to the appliance with low heat. The ring clasp was fitted to the abutting molar and adapted to the partial frame. Taking into account the thermal conductivity of the chrome-cobalt frame, the phaser welder was dialed into the correct settings. Phaser welding is a type of pulsed tungsten inert gas welding (TIG welding). The alloy's thermal conductivity is more important than its melting range. A sharpened 0.6-mm tungsten electrode ensures accurate spot welding to the partial frame. The pulse energy of the weld is able to penetrate up to 1.5 mm of depth, or as shallow as 0.1 mm.

In this case, the technician adjusted for a solid weld between the ring clasp and the partial denture. The sprue was left attached during the weld for easier handling (stabilization). Once positioned on the model, the ring clasp was attached with only about five to seven spot-welds starting on the occlusal (Figure 7). A close-up reveals how clean and strong the weld was due to the proper argon gas setting (Figure 8). The frame was removed from the model and welded from the underside of the rest until it was finished (Figure 9). If there were to be a need for any additional build-up for strength, chrome-cobalt wire could be added. The sprue was then removed, and the clasp was finished down (Figure 10). The technician ensured the fit on the model and spotted down the occlusion. The retention was functional without any prying forces and had increased esthetics. Minimal partial polishing was necessary due to the small heat zone when phaser welding was adjacent to the acrylic or porcelain (Figure 11). These tools and techniques save time and cost for the laboratory, compared to the headache of extra models, hand waxing, and laser welding.

CONCLUSION

The speed and efficiency of the completion of this case relied on the laboratory acquiring the correct means for the task. The dentist and the patient were very pleased at delivery of the newly repaired partial (Figure 12). Both Primotec light-cure wax patterns and the MX2 phaser welder worked together as an advantage for the laboratory. Cost efficiency for both repairs and new fabrication of dental restorations are endless with these systems.

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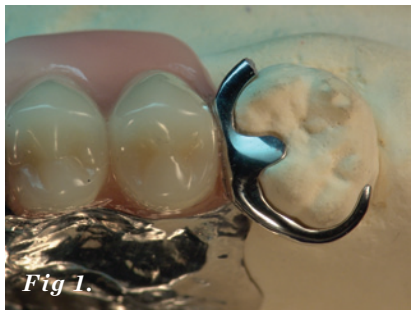
Fig 1.

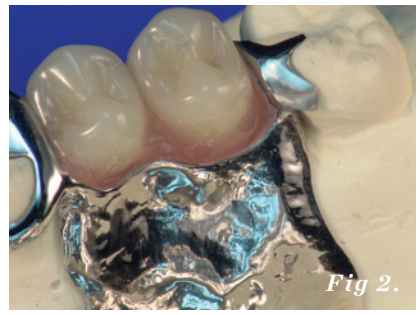
Fig 2.


Fig 3.

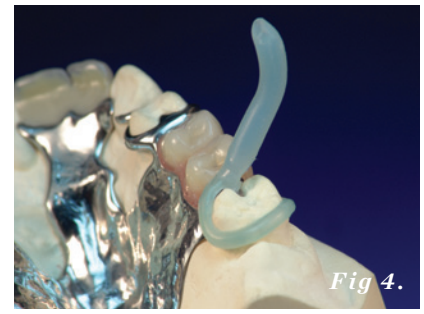
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Fig 5.


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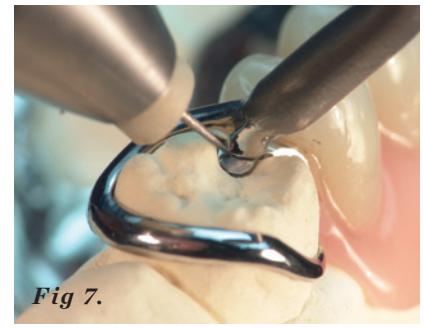
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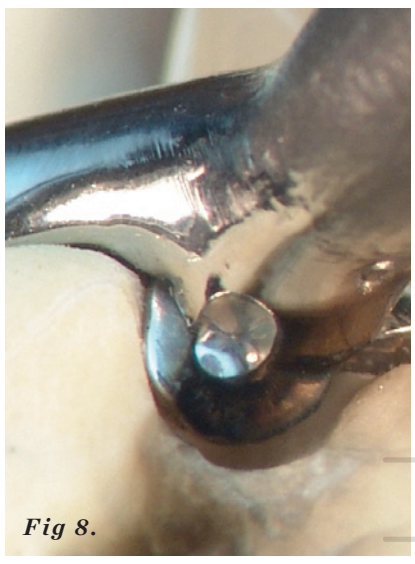
Fig 8.


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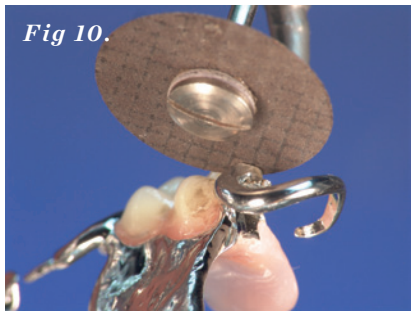
Fig 10.


Fig 11.


Fig 12.

Fig 1. A common laboratory obstacle of a partial-denture repair.

Fig 2. The clasp was assembly cut down and prefinished, ready for wax-up.

Fig 3. Primotec Metacon light-cured wax preformed patterns.

Fig 4. The Metacon ring clasp pattern in place and adapted to the partial.

Fig 5. A perfect, smooth casting of the ring clasp.

Fig 6. The Primotec phaser MX2 pulsed micro-arc welder.

Fig 7. Fast and simple welding to the partial frame was accomplished in only a few spot welds.

Fig 8. A single spot weld with the Primotec phaser.

Fig 9. The phaser produced very controlled precise welding with very low heat, no acrylic distortion, or scorching.

Fig 10. The sprue was removed. Final finishing and spotting of the occlusion was completed.

Fig 11. The finished ring clasp repair.

Fig 12. The final result and fit.