SPECTRUM Denturism

May 2009 • Vol. 3, No. 2

THE VOICE OF TECHNO-CLINICAL DENTISTRY

The Enhanced Restoration of Removables

Jim Collis, CDT

Patients with existing full or partial dentures often report that they would like to improve the appearance and fit of their dentures without going through the substantial expense and time-consuming process of replacing their dental work. Until recently, denturists, dentists and dental laboratories were limited in terms of what they could provide the patient that would be affordable from the patient's perspective, while allowing the practitioner the ability to recover the labor costs associated with the restoration. Now, new equipment, like the Renfert Sympro, an innovative rotating denture cleaning device with acid resistant stainless steel needles, and products, such as Vita's VM® LC, a light-cured indirect tooth-colored composite, and GC America's Gradia® Gum, a light-cured tissue-colored composite, afford practitioners the opportunity to cost-effectively provide a value-enhanced restoration, a fully "relined and revitalized" removable.

Removable restoration has historically been a labor-intensive and time-consuming task with dubious results. Even in the simplest of restorations, removing stains or picking out calculus deposits has involved some combination of: sandblasting, chiseling, grinding, and ultrasonic cleaning. This process is followed by pumicing and polishing. In other cases, a rebase is prescribed to remove all the old acrylic. Rebases require a number of steps. The impression is poured up and invested. Then the flask is separated and all existing acrylic is ground off the denture. The teeth are returned to the mold and packed. If any characterization is to be done, that is accomplished with powder and liquid in the flask. Characterization results are not predictable. Some of the problems that occur are porosity, movement of the toning material during packing or injecting, or a lack of consistency in characterization. Most significantly, there are limitations as to what the patient may be willing to pay for results that may represent only a nominal enhancement to the appearance of their appliance.

The following is a detailed description of a recent full denture case as it was successfully "relined and revitalized" for a patient. The first step was to thoroughly clean all deposits, stains and remnants of adhesives from the surfaces of the dentures.

Fig. 1a

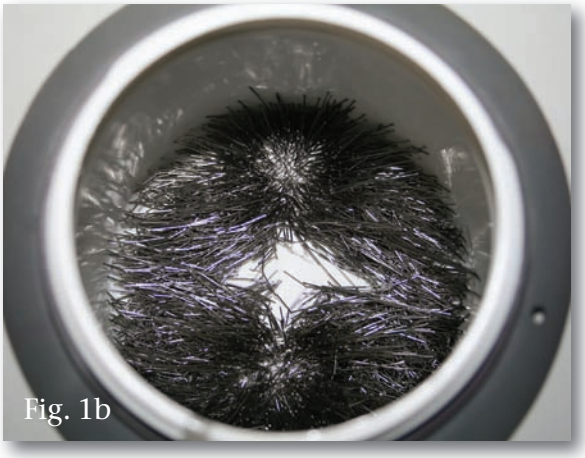
Fig. 1b

Renfert has recently introduced a piece of equipment, the Sympro, which greatly simplifies the dental cleaning and preparation process. The Sympro, a unique and highly efficient type of denture cleaner virtually eliminates the need for manual sandblasting, chiseling and grinding. The cleaning chamber of this unit consists of a removable cylinder that is set at a 35 degree angle of inclination. Fine acid-resistant needles are placed in the cylinder (See Fig 1b) along with Symprofluid "Universal" cleaning fluid and the denture prosthesis. The multi-speed chamber rotates and periodically reverses rotation direction for maximum cleaning efficiency. The 35 degree angle of inclination of the chamber causes the prosthesis to resist the flow of the liquid, maximizing the performance of the unit and minimizing the time required to clean the prosthesis. The cleaning chamber sits upon magnets that cause the stainless steel needles to stand up and interact with the surface of the prosthesis as it rotates in the cylinder. The needles are ideal for cleaning hard-to-reach interdental spaces.

You can see pictures of the existing upper and lower dentures immediately before (See Fig. 2, Fig. 3, and Fig. 4) and after being cleaned in the Sympro unit (See Fig. 5, Fig. 6, and Fig. 7). As the pictures demonstrate, the Sympro was very effective at removing: tar, nicotine, coffee and tea stains on the upper and lower, as well as a buildup of calculus on the lingual and buccal surfaces of the lower.

If the dentist owns a Sympro, the denture would be cleaned in this unit at the dental office. The dentist would then take a border molded reline impression in the cleaned denture to be poured up at the office or sent to the lab to be poured up. If only the laboratory owns a Sympro, then the dentist takes the reline impression in the


Fig. 2


Fig. 3


Fig. 4


Fig. 5

denture before cleaning and sends the poured up models or the impressions to be poured up to the lab. After the pour up step, the lab would then mount the poured up cast and denture on a reline jig. The denture is then separated from the cast, reline impression material is removed, and the denture is cleaned in the Sympro unit.

In my case study, the dentures were cleaned in the Sympro unit. Impressions were then taken (See Fig. 8a). The impressions were poured up using HI-TEC Dental Products, Inc. yellow model stone, made specifically for use in denture work. All dental stone was mixed under vacuum before being poured to ensure a homogeneous mix and eliminate bubbles (See Fig. 8b). Then the case was conventionally relined in a reline jig.


Fig. 8a

Fig. 8b

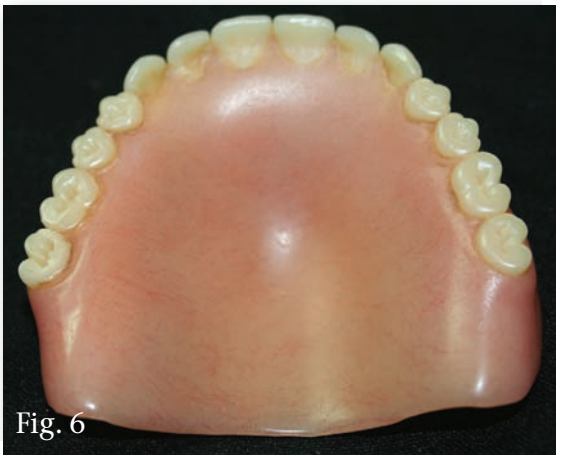
Fig. 6

After the reline, the upper and lower dentures were finished with full anatomical features including: root structure, papillae and soft tissue attachments (See Fig. 9). This anatomy provided the basis for the application of the tissue-colored composites. The surfaces of the denture bases were taken to an arbor-banded state in preparation for naturalization with GC America's Gradia® Gum tissue-colored composites. A thin layer of composite primer was painted on the complete surface of the pink denture base,


Fig. 7


Fig. 9

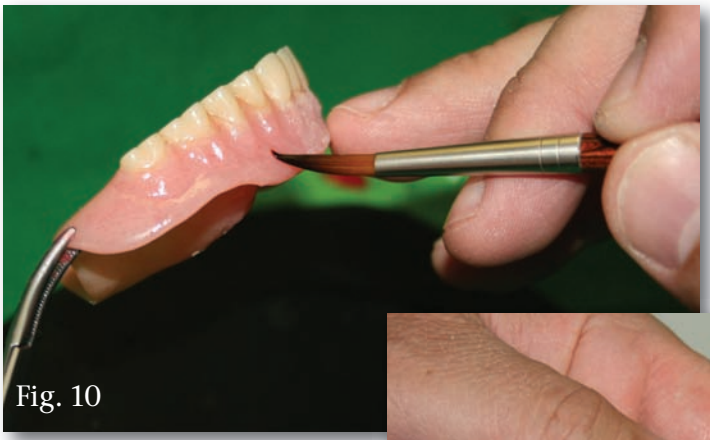
Fig. 10

including the interdental papillae, and cured for two minutes in GC America's Labolight (See Fig. 10).

The next step was the application of the darker red GM36, gum modifier (other shades available) to simulate healthy, enriched tissue. This material is applied with a small Renfert Ceramicus #03 brush starting high on the interdental tissue and drawing the brush in a downward stroke between the root prominences and interconnecting below, but not covering, the root prominences (See Fig. 11). The gum modifier is cured for 10 seconds under the GC America's Steplight. The GM36 can be painted on by quadrant and cured in place before proceeding to the next quadrant to avoid any slumping or running of the material (See Fig. 12). As the picture demonstrates, it is intentional that there are variations in the thickness of the application of the gum modifier material to replicate the color variations of natural tissue in the mouth.


Fig. 11

Application and curing of the GM36 is followed by an application of GM35, a translucent vanilla-colored material. Using a Renfert Ceramicus #01 brush, begin at the second molar applying a thin layer around the cervical of the teeth and on top of the root prominence, allowing the GM35 to slightly overlap the adjoining GM36 material by about 1-2 millimeters. The translucence of the GM35 will allow some filter through of the darker GM36 and enhance the natural appearance of the denture base by giving it the illusion of depth. Apply the GM35 one to two teeth at a time curing under the Steplight for 10 seconds and then continuing to the next section (See Fig. 13).

The next step in the revitalization process is the recontouring of denture teeth using Vita's VM® LC tooth-colored light-cured composites available in Vita's 3D shades. In this case study, only the posteriors of the upper denture presented wear and needed to be restored. The occlusal surfaces of the teeth to be repaired are sand-blasted (can also roughen with an acrylic bur) and composite primer is lightly painted on the roughened surfaces using a Renfert Ceramicus #03 brush. The composite is applied using a small, flexible Renfert composite tool. The occlusal surfaces are repaired as needed using the appropriate shade, never building up more than 2 millimeters at a time without curing for 10 seconds under the Steplight.

Once all the composite work is completed, the denture


Fig. 12


Fig. 13


Fig. 14a


Fig. 14b

is ready to go to the final curing phase. The denture base and teeth are completely painted with an Air Barrier using a Renfert Ceramicus #8 brush. (See Fig. 14a) The denture is cured in a Labolight for 3 minutes. (See Fig. 14b) After curing, the Air Barrier coating is washed off using a stiff brush and soap. Because we finished the denture with full anatomy after the reline, and only applied thin washes of the tissue composite and thin buildups of the tooth composite, no finishing is necessary. The case is stippled, pumiced and polished in the normal fashion (See Fig. 15 and Fig. 16). The polish material is washed off the denture and the restoration is complete. The "relined and revitalized" case is ready for delivery (See Fig. 17).

For denturists and dentists, this restoration process provides a value-enhanced alternative to offer the patient in lieu of the traditional reline, rebase or replacement possibilities. For the patient, this process provides them with an appliance that has better fit and appearance for significantly less cost and inconvenience than replacing their existing denture. From the laboratory's perspective, the combination of the time-savings afforded by the Sympro unit and the ease of application of the tissue and tooth composite materials makes the "reline and revitalize" process a profitable service to offer their clients.


Fig. 15


Fig. 16


Fig. 17

About the Author

Jim Collis has owned and operated Collis Prosthodontic Laboratory since 1980. The lab specializes in high quality removable prosthodontics and laser welding and primarily serves a select clientele of dental offices in the western suburbs of Chicago. Jim has also previously served as an instructor in the Junior/Senior laboratory of Northwestern University Dental School for ten years. In that capacity, he presented numerous courses to the dental school students on prosthetics including: advanced esthetics pertaining to removable prosthodontics, fixed work, and advanced attachment and implant techniques. He has presented lectures and hands-on clinics at various venues throughout the United States, Canada and Germany. He is a consultant for several companies in the industry. He possesses a degree in Dental Technology from Triton College, and has been a Certified Dental Technician for thirty years.