

Processed Denture Bases and Centric Relation Records

A Simplified Approach

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Complete denture treatment is an art as well as a science. Fabricating a set of hard plastic teeth that fit and function on resorbed, mobile, residual ridges is a feat that is not easily accomplished. It is easy to get frustrated during denture fabrication. Loose trial denture bases make for difficult and possibly inaccurate jaw relation records. These are two of the most frustrating issues that we must deal with. This paper will describe techniques that help overcome these problems.

Denture Bases

Denture bases support the prosthetic teeth and are designed to transmit the masticatory load to the load-bearing tissues. Well fitting bases are retentive as well as comfortable during function. During the fabrication of complete dentures, trial (temporary) bases are fabricated from either shellac, wax, composite resin or autopolymerizing resin. These bases are designed to record jaw relations and set teeth for the try in appointment. Once these appointments are complete the record bases are discarded during the flasking and processing procedure. The record bases are generally non retentive because undercuts are blocked out during their fabrication so as not to damage the master cast. This results in the need to place an adhesive into the base during try in appointments in order to secure it to the residual ridges. The looseness of the denture base also makes it difficult to record centric jaw position, evaluate the



Fig. 1. The maxillary processed base has been waxed and is ready for flasking.



Fig. 2. Maxillary processed base in heat cured acrylic.



Fig. 3. A wax rim has been added to the processed base. The rim can now be adjusted in preparation for centric relation records.

tooth set up, and assess denture retention before it is processed.

Processed Denture Bases

Processed denture bases involve processing the final denture material (usually heat cured acrylic) to the master cast immediately after it has been poured. This base is the denture base that will ultimately be part of the final denture that the patient will wear. The denture teeth are connected to this base during a secondary processing. Using the processed base, the registration of centric position is easier since the bases do not move, try in sessions are simpler since the bases are secure, and the patient has an immediate idea as to the fit and retention of the final prosthesis since the base at try in is the final base. Dental laboratories have all the materials needed to fabricate this type of prosthesis.

Method

The master impressions are made and poured using standard methodology. For the maxillary processed base, a post dam is placed into the cast using a scraper. Rope wax is placed into the sulcus region and the cast is covered with a sheet of Thinx wax. (Modern Materials, Columbus Dental, St. Louis, MO 63188). Additional wax is added to the post dam area to thicken the region (Fig. 1). The mandibular base is waxed by adding wax rope wax directly to the sulcus area and then covering the ridge and periphery with Thinx wax. The dental technician can then flask and process



Fig. 4. Centric relation balls have been positioned in the mandibular base in preparation for the record to be made.



Fig. 5: The immediate area above the balls has been softened. The registration can be made.



Fig. 6. An imprint of the balls is evident in the wax of the maxillary base. The registration is now complete.

the base in heat cured acrylic. This is then deflasked and trimmed to the proper contour (Fig. 2). A mounting cast can then be fabricated by blocking out the ridges and pouring dental stone into the base (the master cast is lost during the processing so the mounting cast gives the technician a method to mount the casts on the articulator). The base is delivered with a wax rim to the practitioner for his/her use in the establishment and registration of vertical dimension (Fig. 3). The base must be kept wet to minimize dimensional changes in the acrylic. Clinically, the dentist must "fit" the base to the tissues using the same methods used when "fitting" a denture. Pressure indicating paste is applied to the denture base to help identify undercuts and pressure regions that need adjustment. These adjustments are carried out at this time. The denture base can now be assessed for comfort, fit and retention. If these conditions are not acceptable to the patient or to the dentist, the problem can be addressed and rectified before proceeding to the next step.

Centric Relation Records

The ease and accuracy of a centric jaw relation record is directly related to the fit, stability, and retention of the record bases. Since the bases described are as stable as the final denture, one cannot expect a more stable venue for creating the centric relation record. A variety of materials are available which help the practitioner record the centric position. Classically, wax bite rims are adjusted

for height, shape and position, notches are cut from the wax and a recording medium is placed into the notches to record the jaw position. Recording mediums such as waxes and plaster based materials have been used. The plaster based materials may be difficult to handle and take time to set. Once set, it is difficult to confirm whether the jaw position has indeed been registered. The method presented in this paper is one that can be checked and confirmed to a limited degree.

Method

Once the wax rims have been finalized, three steel balls (Daisy Quick Silver Steel Airgun Shot - 4.5mm Cal. Daisy Manufacturing Co., Inc., Rogers, AK, 72757) are positioned in the wax of the lower rim. These three balls are positioned one in the midline and the others bilaterally in the first premolar region (Fig. 4). The stainless steel balls are set in the wax so that half the height of the balls protrude beyond the occlusal surface of the wax rim. The area immediately above the balls is softened using a wax spatula (Fig. 5) and the patient is guided into the jaw position. The registration is made by imprinting the balls into the maxillary rim (Fig. 6). Once complete, the patient is asked to "open and close", several times and an evaluation of the reproducibility of the recorded jaw position is made. The bases are then removed and chilled in cold water. A facebow record can then be made on the maxillary rim and the



Fig. 7. Mounting casts have been fabricated and the bases are mounted in preparation for denture tooth set up. Once the denture tooth position has been verified, the teeth will be processed directly to the processed base as the final prosthesis.

bases are then mounted on an articulator (Fig. 7) using the mounting casts that have been fabricated.

Discussion

Denture fabrication may be difficult at the best of times. Any technique that makes the process easier and more accurate will enhance the final outcome for both the dentist and the patient. This paper has described a simple method to stabilize dentures bases during record fabrication and try in. The described procedure for recording jaw position is simple and reproducible. The outcome is a more comfortable procedure for the patient and a more satisfying result for the dentist. The procedures outlined are easily accomplished using readily available materials and make a significant difference to the outcome of denture prosthetics. ■