Tips from the lab

COMMON LABORATORY ROADBLOCKS

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The dentist-laboratory partnership is well over 100 years old, and continues to flourish because of the drive for constant improvement from both parties. At the laboratory, we send out a doctor feedback card in every case so that our clients can tell us specifically how we can improve. I am always impressed how many of our dentists call our laboratory and ask for constructive criticism regarding their preps and impressions. It is in this spirit of continuous quality improvement that we present a summary of the most common obstacles we see that stand in the way of ideal restorations.

Inadequate impressions

The most common error seen on the lab floor is inadequate impressions. Usually the first mistake that is made is in the choice of impression trays. Plastic perforated trays are acceptable for pre-op alginate impressions, but are not rigid enough to use for monophase or other elastomeric impression materials. In cases when an elastomeric material, such as a polyvinylsiloxane is desired, a metal perforated tray will be superior to the plastic tray for a pre-op impression. When taking the final impression for the fabrication of the removable prosthesis, nothing can match a custom tray for accuracy. Since the borders of the tray match the contours of the patient's mouth, your ability to achieve an ideal impression are greatly enhanced.

When alginate impressions are taken, they should be poured before sending the case to the laboratory, whether the lab is across town or across the country. In edentulous situations, a special edentulous tray can be used with a dual-viscosity alginate to give near ideal impressions (Accudent- Ivoclar/Vivadent). If using an elastomeric material, such as a polyether, it is desirable to use a heavy and a light viscosity to improve accuracy. The heavy body material is placed in the vestibule to border mold the tray, and the lighter body material is used as the wash material in the tray.

Figure 1 shows an alginate impression used in a stock metal tray as a final impression in an edentulous patient. Clearly, this doctor and patient would have benefited from the use of a custom tray, and either an elastomeric impression material or a dual-viscosity alginate that would be poured in the doctor's office. Figure 2 shows a model made from a plastic tray with alginate that was not poured in the doctor's office. Unfortunately, this impression will need to be retaken. Figure 3 lacks the palatal and peripheral detail to construct this partial denture as prescribed. Figure 4 illustrates that an adequate model can never be poured from an inadequate impression.

Bad bite registrations

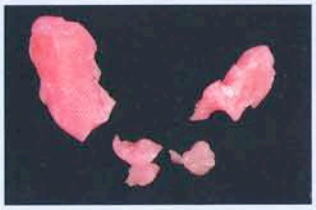
Inadequate bite registrations make it difficult to deliver a prosthesis that will need minimal amounts of post-insertion adjustments. Figure 5 shows a baseplate wax registration that has fallen apart prior to mounting. Wax is both temperature- and travel-sensitive, and studies have shown it to be one of the least reliable bite registration materials. Figure 6 shows the use of a better material (Blu-Mousse, Parkell) but, due to an edentulous space, the bite registration was only taken on one side. This led to the inaccurate bite shown in Figure 7, which shows an anterior open bite even when the models are fully occluded into the bite registration. In cases with edentulous spaces such as this one, a bite block is always preferable to a unilateral bite, or a "mush bite." Most bite blocks work best when the wax is relieved until it is out of occlusion, and the registration is taken passively with a rigid bite registration material (Capture, Glidewell Direct). The most accurate bite registrations available today are the fast-setting polyvinylsiloxanes. When using them for removable bite registrations, it is best to practice having the patient close into centric several times while you evaluate the position of the anterior teeth. Then place the bite registration material on the lower molars while the patient closes into this rehearsed position. Observe the position of the anterior teeth to ensure that the patient has closed into the proper position. Once you have verified this and the posterior segments have set, inject bite registration material between the anterior teeth to connect the two posterior segments.

Misuse of a stock tray for an edentulous patient.

A poor pre-op impression makes it difficult to fabricate even a custom tray.

This unusable model resulted from improper impression techniques.

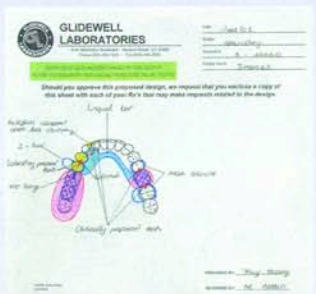
It is impossible to produce an adequate model from an inadequate model.



Baseplate wax is a less-than-ideal bite registration material.

As a rule, bite registrations should always be bilateral rather than unilateral.

The unilateral bite registration in Figure 7 has resulted in an anterior open bite.



Glidewell Laboratories Removable Design Service can design several options for removable and combination fixed/removable cases.

Conclusion

Ideally, the design phase of a removable partial denture should involve both the dentist and the laboratory as shown in Figure 8 (Removable Design Service, Glidewell Laboratories). The lab technician is able to use the model and a surveyor along with his or her knowledge of all the different attachment systems to help the dentist design a successful case. A good technician will return the model to the dentist with the proposed design along with notes and illustrations showing the clinical rest preparations and guide planes that are necessary to make the case a success. By working together, dentists and technicians can combine their knowledge and experience to create removable prostheses that are functional, esthetic, and pleasing to the patient.