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Contemporary Esthetic Techniques for Optimal Smile Design



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Dental professionals must ensure consistent communication from the very outset of the diagnostic stage through-out preparation design, impression making, and provisionalization in order to ensure restorative success.



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As dental procedures continue to evolve, allowing for minimally invasive procedures that deliver optimal esthetics, clinicians and technicians are joining forces to increase overall patient satisfaction. While there are a variety of preparation designs that can be utilized to deliver results based on the patient's needs, the key factors to restorative success are thorough diagnosis, preparation design, impression making, provisionalization, and, most importantly, communication.

Diagnosis

Every case must begin with a full diagnostic workup (ie, a full series of radiographs, panoramic images, mounted models, evaluation of facial structures, and occlusal schemes). Once the soft tissue, hard tissue, and musculature are evaluated, an oral cancer screening should be performed and a joint examination initiated. The patient's desires and concerns evaluated, and a full series of photographs should be taken to ensure proper diagnosis and treatment planning (Figure 1). High-speed, electronic communication will assist the practitioner in properly preparing



Figure 1. A preoperative retracted view should always be forwarded to the laboratory in order to communicate the existing anatomy.



Figure 2. Photography of the prepared tooth structures should be captured and transferred to the technician before impression making.



Figure 3. The diagnostic waxup can be used to confirm length, width, and form.

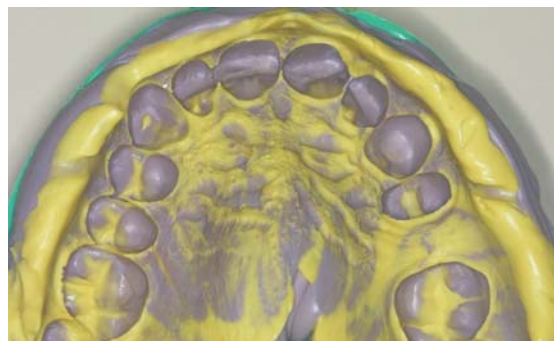


Figure 4. An accurate impression that details the existing structures is imperative to treatment success.

Recommendations for Clinical Success

- Use a full tray technique to allow for the use of a maximum amount of impression material;
- Utilize the compressive force technique to capture clear margins and preparation design information;
- Be sure to apply consistent pressure during impression capture for at least 30 seconds; and
- Observe the 90-second set time to facilitate multiple pours with no tearing.

tooth structures for the subsequent restoration and will allow the technician an advanced understanding of patient expectations.

Preparation

When preparing dentition for an esthetic restoration, a variety of preparation designs can be utilized, and a degree of creativity is encouraged. For minimally invasive restorations that only require 0.5 mm of facial reduction with two planes of reduction on the middle and incisal thirds, there is no need to break contact; the preparations can be completed equigingivally with rounded incisal edges. It is unnecessary to create a positive seat on the lingual aspect for these restorations (Figure 2).

For restorations that require a more generous porcelain buildup, approximately 1 mm should be removed from the incisal edge to facilitate sufficient translucency. However, incisal edge reduction is not needed when crown lengthening is desired. When delivering three-quarter veneers, additional reduction will be needed to allow the incisal edge of the restoration to wrap over the lingual aspect; care must be

taken to ensure that the finish line is maintained above the cingulum and covers the entire lingual surface of the tooth. This type of restoration is utilized primarily when modifying the patient's clearance pattern of mastication and speech, in order to guide the patient to bilateral simultaneous contacts.

Additional preparation designs of note include the window preparation, in which the facial surface is lightly prepared and wrapped over the cuspal tip. When treating preexisting mesio-occluso-distal amalgam restorations, a modified preparation technique can be used to incorporate a veneer preparation on the facial aspect and an onlay design in the middle third. This will overlap the buccal cusp to become one "veneer-lay" restoration.

It is critical to maintain communication with the laboratory technician, even throughout the preparation phase. The technician can provide a putty reduction guide to determine if sufficient incisal and facial reduction has been created based on the diagnostic waxup information (Figure 3). Modifications to the preparation design can be made as necessary before final restorations are delivered, based on laboratory feedback.

Impressions

Capturing an accurate impression is critical to restorative success. Flowable polyvinylsiloxane materials such as Flexitime (Heraeus Kulzer, Armonk, NY) allow the clinician to maintain the impression's dimensional stability following multiple pours, without breaking the models (Figures 4 and 5). These materials are not as hard as polyether materials and do not require extended setting times. Flexitime can be predictable when used with the compressive force technique, ensuring that sufficient light-bodied wash material is placed into the sulcus for the transfer of clear



Figure 5. A mounted model can then be created to determine the preparation design and contour.



Figure 7. The postoperative result following veneer restoration demonstrates harmonious integration and esthetics.



Figure 6. Provisionalization ensures an esthetic result, while closely resembling the definitive restorations.

marginal detail. Full trays should be used for this technique, particularly when restoring multiple units.

Provisionalization

The provisionalization period is critical to verify that the patient is satisfied with the esthetics and function of the proposed restoration. Communication between the laboratory and the clinician is imperative during this phase, to ensure that considerations such as contours, shape, length, position, function, and occlusion are verified and correctly transmitted. The use of a bis-acrylic provisional material such as Venus Temp C&B (Heraeus Kulzer, Armonk, NY) allows the practitioner to easily mask the underlying preparations, while providing unsurpassed esthetics that nearly mimic the definitive result (Figure 6). These provisional materials are available in multiple shades and do not require extended set periods, thus increasing the speed in which they can be delivered.

Because of their inherent tensile strength and composition, bis-acrylic materials can be used for the extended provisionalization period (approximately two to four weeks) without fracture. When positioning the provisional, a microbial agent should be applied to prevent infection, followed by a desensitizing agent and a primer to provide a light adhesion between the teeth and the provisional. This will further prevent anaerobic activity beneath the bis-acrylic restoration.

Bis-acrylic provisional materials are easily polished and can maintain the glaze well once occlusion is corrected and they have been finished with a polishing disc. Bis-acrylic materials can be modified easily to accommodate the patient's needs or the laboratory's suggestions by using a flowable composite material for additional structure; excess structure can also be easily removed using burs and finishing discs.

Once the patient has approved the provisional, another impression should be taken using a clear bite registration material (eg, Memoreg 2, Heraeus Kulzer, Armonk, NY) in a full tray. The bite registration should be transferred to the laboratory to communicate the final tooth shape. This information can then be transferred to the articulator and used during the fabrication process for the definitive restoration (Figure 7).

Conclusion

By maintaining clear communication throughout the entire restorative process, the clinician and the laboratory technician will guarantee predictable patient satisfaction. The inclusion of pictures taken throughout the preoperative and preparation phases, along with a clear, accurate impression, will further contribute to the overall communication between technician and practitioner. Finally, the transfer of information regarding the patient's provisionalization phase is critical for the technician to accurately reproduce the desired length, contour, and design necessary to attain the patient's specifications. Once an open—and continuous—line of communication is established with the laboratory, restorative success should be easily and consistently achieved.

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