Soft-Tissue Esthetics in an Ovate Pontic Receptor Site

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Despite the increasing availability of single tooth implants, many patients choose to close edentulous spaces with fixed prosthodontics. When using fixed bridges to replace missing teeth, especially in the anterior region, the dentist should achieve the most esthetic result possible. In addition to other critical esthetic factors, pontic design can often make or break the final esthetic result. The use of an ovate pontic receptor site is of great value when trying to create a natural maxillary anterior fixed bridge. This article will illustrate the creation of an ovate pontic receptor site with the use of an Er, Cr:YSGG hard- and soft-tissue laser (Waterlase™, BIOLASE® Technology, Inc). This author has found this to be the easiest, most atraumatic way to create this type of pontic receptor site.

Case Presentation

Preparation and Evaluation

The ovate pontic receptor site is a depression or socket created in the soft tissue that allows the cervical aspect of the pontic to emerge from it, making it appear to emerge from the alveolar ridge. Additionally, because the pontic occupies the same space that the original tooth did, the emergence profile of the pontic appears natural, especially when compared to a modified ridge lap pontic. Modified ridge lap pontics also have the disadvantage of usually appearing too long when compared to adjacent or contralateral teeth. The outer edges of the soft tissue depression are approximately 3 mm higher than the floor of the depression, and on the mesial and distal sides these edges represent the new interproximal papilla. The desired shape of the depression has been described as resembling the larger, rounded end of an egg. Biologic width principles apply to the pontic receptor site as well, and the dentist needs to ensure that there will be 2 mm of gingival tissue between the base of the depression and the alveolar bone. One of the main advantages of doing this procedure with the laser is the ability to remove some alveolar bone, and if necessary, after soft-tissue shaping, re-establish the biologic width. There are two patient scenarios that can occur before creating an ovate pontic receptor site: the patient has a tooth that still needs to be extracted, and the patient already has established edentulous space.

In the case of the tooth that needs to be extracted, treatment is relatively straightforward, predictable, and is typically an esthetic success. The advantage in a situation such as this is the presence of the interdental papilla before extraction that will allow the dentist to achieve a superior esthetic result. The most predictable way to treat this type of case is with a laboratory-fabricated provisional restoration. The laboratory "extracts" the tooth to be removed on the model and then "sockets" the model to mimic what the extraction site will look like. In this case, it is preferable to have the tissue side of the pontic longer rather than shorter because there is no chance of biologic width violation, and the laboratory should attempt to have 3 mm of pontic extend into the extraction site apical to the free gingival margin. The key is to preserve the papilla during the extraction procedure and to fill the extraction site with the provisional pontic as soon as possible.

In addition to other critical esthetic factors, pontic design can often make or break the final esthetic result.

The time-honored practice of having the patient bite down on a 2-inch x 2-inch gauze pad to stop the bleeding is contraindicated in this procedure. Because the tooth has been extracted, the interdental papillae has no support until the provisional is cemented. By biting on the gauze, the patient will most likely collapse the papillae, causing the dentist to lose the benefit of its presence. To preserve as much of the facial and interproximal bone as possible, it behooves the dentist to strive for an atraumatic extraction with the use of more conservative instruments, such as periotomes.

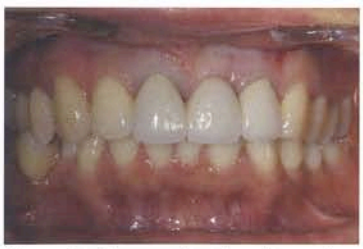

Figure 1—Preoperative view of pre-existing bridge. Patient did not like bulbous nature of modified ridge lap pontic and wanted to replace porcelain-fused-to-metal (PFM) bridge with an all-ceramic bridge that would appear more lifelike.

Treatment Using Waterlase™

In the case of the tooth that has been missing for some time, it becomes necessary to create the same type of socket that existed in the extraction scenario (Figure 1). As part of the planning process for this type of case, an occlusal photograph should be taken over the proposed surgical site to determine whether there is enough bone thickness faciolingually to perform the procedure. Typically, in long standing extractions, the problem will be the loss of facial bone in the edentulous area. In these cases there is simply no bone or soft tissue present in the area where the ovate pontic receptor site would need to be placed. The dentist may be forced to use a modified ridge lap pontic, or perhaps refer the patient to a periodontist for possible ridge augmentation. In these types of cases the interdental papillae have been irreversibly lost, but our attentions are focused toward attempting to simulate the interdental papillae through our soft-tissue sculpting and provisional contours.

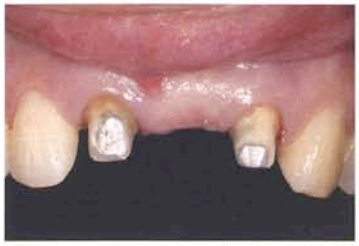

Figure 2—When the existing bridge was removed, it was apparent that the extraction site was not treated as an ovate pontic receptor site. The ridge had completely healed over and there was no interdental papilla adjacent to the edentulous space.

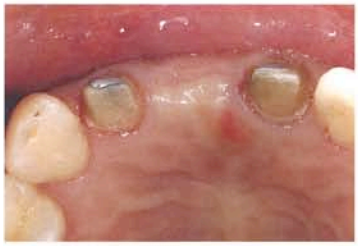

Figure 3—When viewed from the occlusal, it was possible to determine that there was enough ridge width faciolingually to proceed with an ovate pontic receptor site. In some cases it is necessary to use a modified ridge lap pontic design.

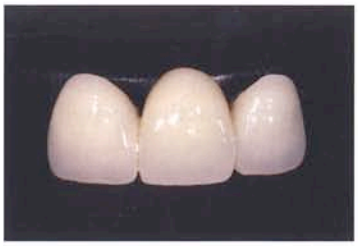

Figure 4—The BioTemps® bridge (Glidewell Laboratories) has been designed to support the ovate pontic receptor site that will be surgically created at this appointment. It is even easier to place a provisional bridge such as this directly into an extraction site and let the site heal around it.

After the teeth were prepared and the existing bridge was removed (Figures 2 and 3), the laboratory-fabricated provisional was used to help guide with pontic site development (Figures 4 and 5). The tissue side of the pontic was marked with a color transfer applicator, and the provisional was sat until it contacted tissue (Figure 6). The bridge was removed, and, with the Waterlase™ on the soft-tissue setting, this author began to develop the pontic site by removing the tissue where the ink was present (Figures 7 and 8). When the ink-stained tissue was removed, the provisional was reseated and the tissue was sculpted wherever ink was present. One may be surprised at the mesiodistal width of the pontic space as it is developed, but this is necessary to form natural looking, simulated interdental papillae. When all 3 mm of the tissue side of the pontic were apical to the free gingival margin, and the bridge sat without blanching the socket site, the soft-tissue sculpting was finished. However, biologic width remains a concern. A periodontal probe was inserted into the deepest part of the pontic site and pushed into the tissue until it contacted bone. If there are 2 mm or more of tissue remaining on the crestal bone, the provisional bridge is ready to cement. If there is less than 2 mm of tissue remaining, it is necessary to remove enough crestal bone to allow for the 2 mm of gingiva between the bone and the pontic (Figure 9). With the Waterlase™ at the hard tissue setting, 1 mm of bone was conservatively removed.

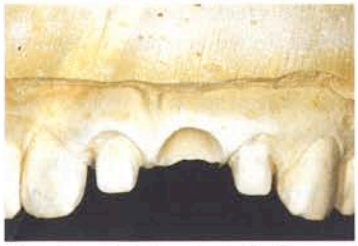

Figure 5—The laboratory technician prepared the model on which the BioTemps® were fabricated to look identical to the intraoral surgical site. Thus, the pontic of the BioTemps® bridge was used as a template for our surgical site.

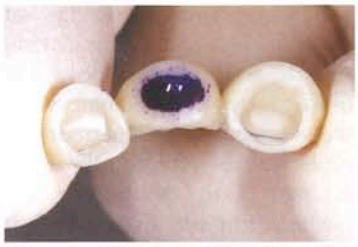

Figure 6—The tissue side of the BioTemps® pontic was marked with a color transfer applicator that was dipped in a small drop of water on a wax-backed paper pad.

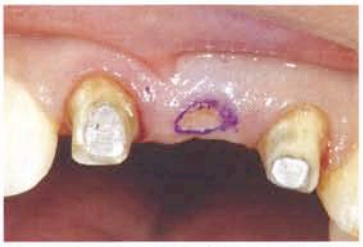

Figure 7—When the bridge was tried-in, the ink left a mark on the ridge where the tissue needed to be removed by the Waterlase™. Note the atraumatic removal of tissue in the area that was marked on the ridge.

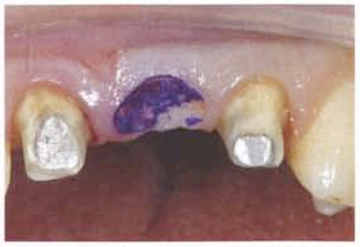

Figure 8—Upon trying the bridge in again, additional tissue needed to be removed on the mesial and facial aspects of the pontic. One of the advantages of using the BioTemps® bridge as a template was the fact that there was no guessing required to remove the correct amount of tissue in the correct location.

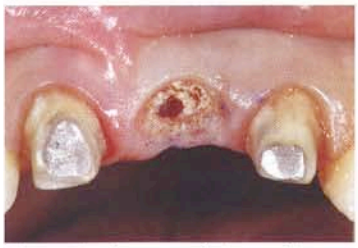

Figure 9—Because of tissue thinness overlying the ridge, bone was contacted. The Waterlase™ was set to the hard tissue setting and bone removal began. There must be 2 mm of space for junctional epithelium between the alveolar ridge and the base of the pontic receptor site.

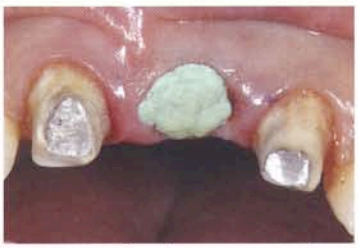

Figure 10—When the tissue removal was finished in the pontic site, Expa-syl™ (Kerr Corporation) was placed into the pontic site to achieve hemostasis. The first retraction cord (size 00) was placed, the preparations were finished, and the second cord (size 2) was placed on top for 8 to 10 minutes.

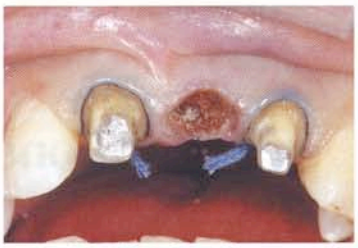

Figure 11—After 8 to 10 minutes the Expa-syl™ was rinsed from the pontic site and the top cord only was removed from around the preparations, and medium body syringe material was extruded into the pontic site and around the preparations while the tray was filled with heavy body material.

Figure 12—Digital photographs of the preoperative condition, the preparations with an adjacent shade guide, and a photograph of the BioTemps™ in place were forwarded to the technician.

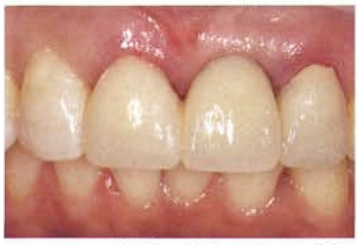

Figure 13—The digital photograph of the BioTemps™ bridge immediately after surgery and provisional cementation.

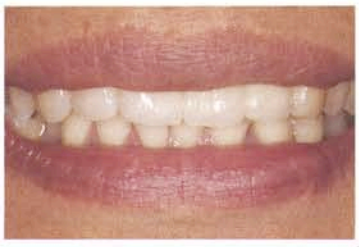

Figure 14—Postoperative nonretracted view of the cemented Wol-Ceram® (Glidewell Laboratories) bridge. The patient was pleased with the appearance and felt it was a major improvement over the previous PFM bridge.

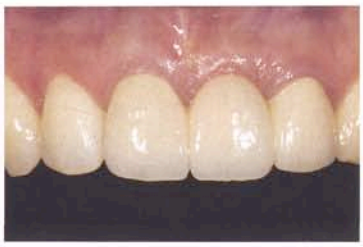

Figure 15—Postoperative retracted view of the cemented Wol-Ceram® bridge.

A minimum of 2 mm of space between the tissue side of the pontic and the crestal bone must be left to allow the soft tissue to fill this space (Figures 10 and 11). In this author's experience with the Waterlase™, there is little discomfort after the procedure. In cases in which bone is removed a dentist can expect the patient to have more discomfort and localized edema, and 800 mg of ibuprofen qid for 3 days administered before dissipation of the local anesthetic is beneficial.

If dentists are confident about their success with this procedure, they can take final impressions at this appointment (Figure 12). The master impression must capture all the details of the preparations and the ovate pontic receptor site to ensure that the laboratory has enough information to properly fabricate the new restoration. Otherwise the patient is appointed postoperatively in 7 days, at which time the provisional bridge is removed, the pontic site is evaluated, and final impressions are taken. Acrylic material from the tissue side of the pontic can be removed at this point if the pontic site seems excessively deeper than 3 mm. It is usually impossible to add acrylic to the tissue side of the pontic at this point, which is why it is initially preferable to have the laboratory make the pontic slightly too long rather than slightly too short. After any necessary adjustments were made, the provisional bridge was recemented and the patient was reappointed 3 weeks later to ensure that the tissue has healed completely before final prosthesis cementation (Figures 13 through 15). The ovate pontic receptor site represents the best opportunity for restorative dentists to recreate what once existed in this space, a tooth emerging from gingival tissues.

Conclusion

For cases in which patients are unwilling to have implants placed, fixed bridges are still used to replace missing teeth. In addition to striving for natural esthetics on the restoration, dentists should also strive to make soft-tissue contours appear as natural as possible. This is especially difficult in the case of ovate pontic receptor sites, in which the tooth has been missing for many years. This article has proposed a method for providing improved soft-tissue esthetics through the use of a laser to recontour tissue and laboratory-fabricated provisional restorations to promote soft-tissue healing. ○

Acknowledgment

BIOLASE® Technology, Inc would like to thank Michael DiTolla, DDS, for writing this article.