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CLINICAL REPORT

Treatment of peri-implant recession with a screw-retained, interim implant restoration: A clinical report

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ABSTRACT

This clinical report describes a patient with an osseointegrated implant and definitive restoration of the maxillary right lateral incisor who was seeking resolution of the recession of the peri-implant tissues which revealed the underlying zirconia abutment. The patient had previously received a connective tissue graft in an unsuccessful attempt to resolve the recession. An undercontoured interim restoration that allowed for soft tissue coronal migration resolved the soft tissue deficiency. (J Prosthet Dent 2019;121:212-6)

Recession of the peri-implant soft tissues has been reported as a potential complication after implant treatment.[1-3] Continued recession of the peri-implant soft tissues may increase the risk for contamination of the rough implant surface should it become exposed and ultimately the loss of supporting bone and the implant.[4] Recession of the peri-implant soft tissues may also affect esthetics by exposing nonesthetic abutment surfaces.[1-3]

Recession of the peri-implant gingiva may result from bone loss, implant position (implant placed too far facially), implant size or configuration (wide or flared neck implants in thin gingiva), abutment shape or size (wide or flared emergence zone in thin gingiva), discrepancies in the prosthetic materials (open margins, casting porosities), retained cement, gingival biotype, or from idiopathic causes.[3,5-8] Special care must be taken to place implants in the esthetic zone for patients with extensive gingival display and thin or normal gingival thickness.[9,10]

The material used (titanium, zirconia, or gold alloy) in the emergence area of the abutment may influence the response of the peri-implant hard and soft tissues, although reports have been conflicting, with some histological data showing reduced bone and soft tissue levels with gold alloys compared with titanium or zirconia.[11] Conversely, a prospective clinical evaluation found no significant differences in hard or soft tissue levels between gold and titanium.[12]

The contour of the emergence profile of the abutment has been shown to have significant effects on the position of the soft tissue, especially along the facial surface of implants in the esthetic zone.[5,13,14] Varying levels of success have been reported by contouring the papilla with changes to the shape of the emergence profile.[15-17] The procedure of shaping the peri-implant soft tissue is most easily accomplished with an interim restoration that can be easily modified.[18] An increased emergence profile will place pressure on the tissues and move them apically. Conversely, undercontouring the facial surface of the emergence zone may allow the gingiva to migrate coronally.[13,16]

The extent to which movement of the soft tissue is possible depends on the thickness of the tissues, the position of the facial bone plate, the position and size of the implant, possibly the abutment material and its surface roughness, and the patient's oral hygiene.[5,19-21] The interim restoration can test what is possible for the given clinical situation. The emergence zone of the interim restoration should be titanium or zirconia where possible, and changes to the contour should be executed with well-polished composite resin or polymethyl methacrylate.

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The interim restoration should be screw-retained (even if the definitive treatment will be cement-retained due to angulation). This will remove any potential for cement irritation of the soft tissue. If the definitive prosthesis is cement retained, it should have margins nearly equigingival, and special care should be exercised to minimize the risk of excess cement.[6,7,22] The interim restoration with the altered emergence profile should be in a position for at least 6 weeks.[23] This time frame will allow for the tissues to move and for the periodontal fibers to mature and stabilize at the new position.[10] What is possible with regard to moving gingiva with emergence contour should not be overstated: movement of more than 1 mm in any direction is rarely achieved.

Figure 1. Initial patient presentation with chief complaint of nonesthetic cervical crown area with zirconia abutment showing.

CLINICAL REPORT

A 27-year-old woman presented with the chief complaint of gingival recession around her implant at the right maxillary lateral incisor position, which had become apparent 5 years after restoration (Fig. 1). Her medical history was noncontributory. The implant was 3.5 mm in diameter with a nonplatform switched design with a trichannel connection (Replace Select Tapered; Nobel Biocare) and had been placed in October 2008. The restoration was an unknown ceramic crown cemented to a ceramic abutment (likely zirconia) with a Ti base. A periodontist had performed an autogenous connective tissue graft 18 months before presentation, which was unsuccessful in correcting the chief complaint.

Intraoral examination revealed a 1-mm exposure of the facial ceramic abutment. Probing depths were 2 to 3 mm with no signs of active inflammation. Her smile line was high with moderate gingival display. The gingiva appeared generally healthy and somewhat thin over the implant. The implant appeared adequately osseointegrated, although evaluation of the facial bone was not possible with 2-dimensional radiography. The emergence area of the abutment where the recession occurred appeared overcontoured.

A treatment plan was established to remove the current restoration, fabricate a screw-retained interim restoration with an undercontoured facial emergence profile, reevaluate at least 6 weeks after placement, and determine whether further surgical intervention was warranted. The facial emergence contour of the interim restoration was made as narrow as possible, producing a pseudo platform-switch design even though this implant did not offer platform-switched components. When the tissues reached a favorable position with the interim restoration, an intraoral scan would be made, and a new definitive restoration and abutment would be fabricated and delivered. Sufficient time with the interim restoration also allowed the patient to understand and experience what was actually possible with regard to the maximum gingival position before proceeding to the definitive restoration. The patient was informed of the likely necessity of a cemented restoration because of the facial angulation of the implant. The abutment was tentatively planned as a zirconia abutment with titanium base (Procera Custom Zirconia Abutment; Nobel Biocare). The cemented crown would be customized lithium disilicate (IPS e.max; Ivoclar Vivadent AG).

Before the existing restoration was removed, a titanium interim abutment (Temporary Abutment Engaging Titanium NP tri-channel; Nobel Biocare) was cleaned and coated with opaque resin (Kolor Plus A1 Opaque; Kerr Corp). A composite resin (Filtek Supreme Ultra; 3M ESPE) shell was fabricated by the dental technician based on the initial intraoral scan and printed diagnostic cast. The screw channel for the abutment was accessed through the facial aspect, the gutta percha screw covering was removed, and the abutment was unscrewed (Fig. 2). The new interim abutment was secured to the implant and angulation was accessed. The abutment was trimmed to the appropriate dimensions outside the mouth to avoid heat transfer and titanium debris to the bone in the area (Fig. 3). The composite resin shell crown was assessed for fit over the abutment. It was connected to the abutment intraorally with a bonding agent (Optibond Fl; Kerr Corp) and flowable composite resin (Filtek Supreme Ultra Flow; 3M ESPE). The screw access was redrilled through the facial surface, and the abutment and crown was removed as 1 piece (Fig. 4). It was steam cleaned and dried, and the emergence areas were filled in with the flowable composite resin. Careful attention was given to the emergence area to ensure very narrow

Figure 2. Disassembly and removal of existing crown and abutment for fabrication of implant-supported, screw-retained interim restoration.

Figure 3. Titanium interim abutment positioned on implant.

Figure 4. Composite resin shell crown connected to titanium abutment with bonding resin and flowable composite resin.

Figure 5. Completed screw-retained, implant-supported, composite resin and titanium interim restoration in position. Facial emergence profile area was undercontoured and left in titanium to facilitate coronal migration of soft tissues. Gingival embrasures were left open 1 mm to allow for possible migration of papilla.

contours, a highly polished surface, and a seamless interface between the titanium and composite resin (Fig. 5).

The completed interim restoration was secured to the implant and tightened to 20 Ncm, a polytetrafluoroethylene (Teflon) screw cover was placed, and the facial access hole was covered with composite resin. The patient was instructed to return after 6 weeks for evaluation of the new tissue positions. Gentle oral hygiene was emphasized.

The patient returned at 3 months and the midfacial gingiva was found to have successfully migrated 1 mm coronally (Fig. 6). This was deemed sufficient to proceed with the new definitive restoration. The interim restoration was removed, a scan body was placed (Elos NP trilobe scan body; Nobel Biocare), an intraoral scan was made (TRIOS; 3Shape) using the "emergence contour" mode to best capture the peri-implant soft tissues, and the interim restoration was replaced. The scan of the peri-implant area was made after the complete arch was scanned and immediately after the removal of the interim restoration. As little time as possible should be allowed between removal of the interim restoration and the completion of the implant site scan to minimize any changes to the position of the soft tissues.

The technician fabricated the abutment and crown with careful attention given to keeping the facial emergence area smooth and narrow (Fig. 7). Margins were 0.5 mm subgingival on the facial, mesial, and distal surfaces and equigingival on the palatal surface to minimize the risk of cement induced peri-implantitis. All components were soaked in 2% chlorhexidine for 5 minutes before placement. The zirconia abutment with a Ti base was tightened to 20 Ncm, and the screw access was covered with clear polyvinyl siloxane material (Reveal clear PVS; Bisco) (Fig. 8). The crown was cemented with a resin-modified glass ionomer cement (Rely X luting plus; 3M ESPE).

Figure 6. Evaluation of soft tissues and interim restoration at 3 months. Papilla and midfacial position of soft tissues migrated approximately 1-mm coronally.

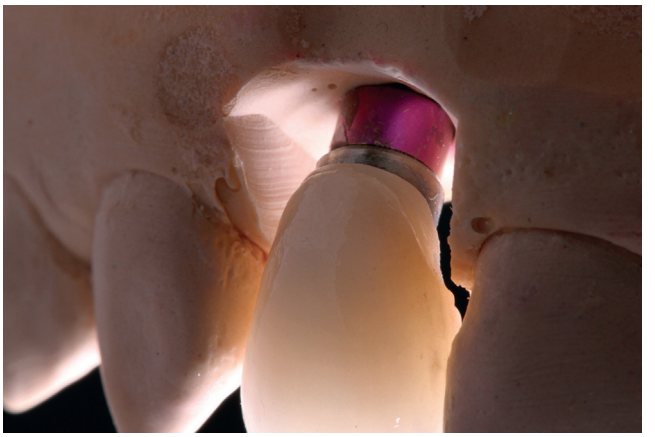

Figure 7. Definitive abutment and crown on cast. Note minimal facial contours in emergence profile area.

Figure 8. Definitive abutment on implant.

Figure 9. Eight-week follow-up.

The patient returned after 2 months for follow-up examination and evaluation (Fig. 9). At that appointment, special attention was given to occlusion, health of the soft tissue, and oral hygiene.

DISCUSSION

The primary advantage of attempting to treat nonesthetic gingival recession with a new abutment and prosthesis is that the procedure is relatively noninvasive. A soft or hard tissue graft may be indicated or preferred in some instances, although careful consideration needs to be given to the existing emergence contours. This is a concept borrowed from the root recontouring commonly performed by a periodontist as part of root coverage procedures in the natural dentition.

The primary disadvantage with prosthetic treatment of recession around implants is that it can be expensive. Its success will also be limited by the volume and positions of the hard and soft tissues. The interim restoration stage of this approach allows for evaluation if correction can be completed with the prosthesis alone or if further surgical intervention is warranted.

SUMMARY

In some instances, moderate recession of the peri-implant gingiva can be treated by modifying the emergence area of the abutment. Generally, undercontouring of the facial abutment surface allows the gingival tissues to migrate coronally. Determination of potential success is best accomplished with a well-designed interim restoration. The apical portion should be made of highly biocompatible materials (titanium), whereas the emergence area should be relatively easy to modify (composite resin). This recession was treated with a new titanium and composite resin interim restoration that allowed sufficient time for the gingiva to migrate to a more desirable position. Once the tissue matured, a new definitive abutment and crown was fabricated and delivered.

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