Inconspicuous anterior implant-supported restorations: Combining clinical and laboratory expertise

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The ultimate goal of tooth replacement in the esthetic zone is an inconspicuous transition from dental restoration to the patient’s natural, biologic tissues. This transition is evaluated at many levels: Color and contour of gingiva at the interface must mimic the natural contours and color of adjacent and contralateral teeth. The dental restoration must match contour and blend seamlessly into the existing dentition. Color matching of final crown must be consistent with existing dentition (hue, chroma and value). This case study explores the management and correction of a previously treated implant-retained maxillary central incisor.

The patient presented as a healthy, 48-year-old female with no contributory health history to prohibit dental treatment. Recent dental history revealed an Ankylos implant to replace tooth #9 had been placed approximately 5 months prior to this visit. The implant had been uncovered and a temporary abutment was placed.

A ridge lap provisional restoration was fabricated to fit the coronal portion of the abutment. The resultant provisional was not only esthetic but also was the source of considerable tissue inflammation and patient discomfort (Figs. 1-3). Patient reported dissatisfaction with the provisional treatment and was seeking a more desirable solution.

Clinical evaluation revealed a well-placed implant with acceptable position both facio-lingually and mesiodistally. Additionally, there was good volume of soft tissue and ridge form was ideal. Surgeon reported that the implant was well-integrated in bone. There was a poorly adapted provisional restoration over an inadequately contoured provisional abutment. Radiograph revealed excess acrylic that extended well into the dental sulcus all the way to the implant platform (Fig. 4). This acrylic did not provide any emergence profile support of transmucosal tissue.

The provisional restoration was poorly adapted to both the abutment and to the ridge crest soft tissue. Intaglio surface was rough and made in such a manner as to create a ridge lap profile. The facial and proximal surfaces of the provisional were fitted over soft-tissue crest. There had been no attempt to modify gingival tissue emergence profile or to create the environment for inconspicuous transition from restoration to biologic tissues.

The provisional was removed and the abutment was placed for 10 days. The provisional was reinserted to allow healing at which time the patient was reinserted in a customized provisional crown, fabrication of a temporary partial denture (Figs. 5, 6) and placement of an appropriate temporary abutment that did not retain a provisional crown (Ankylos sulcus former) (Fig. 7).

This sulcus former, as in name implies, would provide soft-tissue emergence profile support. The partial denture was to be placed to avoid interference with the sulcus former when fully seated (Fig. 8). Patient was to be recalled in one-week intervals to evaluate the response to this treatment. Once healed, a final, custom-milled abutment and cementable all-ceramic crown would be delivered.

The plan was followed per previous description. Postoperative visits were uneventful. Patient comfort was immediate. Tissue health and emergence profile were deemed appropriate at the second week recall visit (Figs. 9, 10).

At a subsequent appointment, the suture-forming abutment was removed, a closed tray impression coping was placed and an impression (identicon, Kettenbach) was taken for fabrication of a final restoration (Figs. 11, 12). Appropriate opposing model, bite registrations and facebow accomplished the case to the laboratory. A careful shade map and clinical photography were included.

Clinically, it was determined that this would be a difficult shade because of surface characteristics and natural color of the adjacent central incisor. Arrangements were made to have a laboratory technician available at the delivery appointment. Sulcus former and temporary partial were rinsed and placed and patient was dismissed and scheduled or delivery appointment.

All model work was accomplished. The laboratory was given the option of fabricating a custom abutment or customizing a stock abutment. This decision was to be based on the trajectory of the abutment relative to the position of the implant. The placement of the implant was ideal and the use of a lab-modified, stock abutment was selected (Cercon Balance Abutment, Dentsply Implant). The contour correlation between the sulcus former and the emergence profile of the stock abutment complement one another. The margins were placed 1 mm subgingivally on facial, mesial and distal. The lingual margin was placed at 3 mm.

Once the abutment was perfected, an all-ceramic crown was fabricated (Emax, Ivoclar Vivadent). The entire crown was waxed to full contour, and then the facial was cut back to provide a field into which a customized surface could be developed from added porcelain. The wax pattern was invested and pressed. The resultant crown was then modified with additional application of porcelain and was left preglazed in anticipation of chairside finishing (Figs. 13, 14).
The delivery appointment was uneventful. The lab provided a seating jig that simplified the positioning of the customized abutment (Fig. 18). The abutment was torqued to manufacturer’s specification (Figs. 16, 17). The crown was tried in and adjusted prior to implant placement and the peri-implant soft tissues.

Pre-operative analysis and prognosis included a smile analysis, diagnostic waxup, and predicted a single tooth restoration. This case study revealed the importance of modifying porcelain and surrounding soft tissues to achieve a single tooth-implant prosthesis. The color match was critical and fundamental to success. The inconspicuous final restoration could not have been accomplished without skilled hands and eyes of a technician at chairside. Close communication and strong laboratory relationships, along with appropriate clinical understanding of soft tissue management, leads to success. The inconspicuous final restoration of this case could never have been accomplished without strong support from the dental laboratory.

References

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