Management of Malaligned Implants with Removable Prosthetics

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Abstract

When patients present with poorly aligned implants restoration can be a prosthetic challenge. This becomes even more problematic when the fixtures are too apical to the palatal hard and soft tissue. Removable prosthetics can overcome the esthetic challenges to these cases and yield acceptable results.

Keywords: Malaligned implants, removable prothesis, buccal flange.

CASE PRESENTATION

A female patient, age eighty four year seen last in the practice two years before presented for a consultation. Her request was to eliminate the need for denture adhesives to retain her maxillary partial denture. Clinical examination noted missing maxillary right lateral incisor and splinted implant crowns that had been present on the left maxillary central and lateral incisors at the last visit to our practice. The dentist who had treated the patient in the intervening time, had extracted the upper right lateral incisor and a healing screw was visible buccal to the crest (Fig. 1). Additionally, the other practitioner had placed a healing screw on the implant at the upper left lateral incisor. The implant placed by our practice several years previously at maxillary right central incisor (Ankylos, Dentsply Friadent) had a “ball” attachment and was noted to be nonmobile (Fig. 2).

Radiographic examination revealed an implant in the position of right lateral incisor that was positioned apical to the palatal crest and buccally angled. The implants at the left central and lateral positions had been placed by a prior practitioner twelve years previously and were Branemark type implants with external hex connectors. The implant that had been at the left central incisor was missing the coronal portion and the apical portion was still retained. Teeth had been added to her current partial denture to replace the fixed prosthetics lost at the right lateral incisor and left central and lateral incisors (Fig. 3).

The patient was on a small fixed income, so a treatment plan was formulated to use the current partial denture and place Locator attachments (Zest Anchors, Escondido, CA) and retrofit the denture to the new attachments.

Contact with the office of the practitioner who had placed the implant at the right lateral incisor position identified the implant placed as a Hi-Tec tapered threaded implant (Herzlia, Israel) with an internal hex connector and a Zimmer Screw-Vent compatible platform (Figs 6 and 7). Tissue height was determined and Locator attachments were ordered to fit the three different implants.

Local anesthetic was administered then the Bident bipolar surgical unit (Synergetics USA, King of Prussia, PA) was used to fully expose the healing screw on right lateral incisor (Figs 4 and 5). During the uncovery of the implant water from the air/water syringe was applied continuously as the high vacuum suction was used to evacuate the area. As the Bident does not place the patient in the circuit due to a lack of grounding plate as used in Monopolar electrosurgery/Radiosurgery no conduction of current occurs through the implant which could potentially lead to deintegration of the fixture. A Locator implant abutment with a 5 mm gingival cuff height was placed and tighten to 25 Ncm (Figs 8 and 9). The Bident was utilized to clear additional gingival tissue on the palatal to allow the male portion of the attachment to be inserted on the implant abutment and permit acrylic to encapsulate the housing. The palatal height of soft tissue at the fixture at right lateral incisor was also reduced to allow the metal housing to be placed and acrylic to encircle the housing (Figs 10 and 11).

Since the Ankylos implant had been restored previously, a Locator attachment was now available. The “ball”
Fig. 1: Healing abutment on the implant at right lateral incisor with the healing abutment not fully seated

Fig. 2: Fractured implant at the left central incisor and mismatched healing abutment present on the implant at the left lateral incisor

Fig. 3: Clinical presentation as the patient presented requesting improvement of the retention of the cast maxillary partial denture

Fig. 4: Bident bipolar surgical unit being used to remove gingival tissue covering the implant cover screw

Fig. 5: Soft tissue following exposure of the cover screw after use of the bident bipolar surgical unit. Note an absence of tissue charring at the incision

Fig. 6: Removal of the cover screw from the Hi-Tec implant, demonstrating the depth at which the implant was placed and its relation to the palatal crest
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Fig. 7: The Locator abutment for the Zimmer Screw-Vent compatible connector at the right lateral incisor on the Locator placement tool

Fig. 8: Locator abutment with a 5 mm gingival cuff seated upon the Hi-Tec implant at right lateral incisor

Fig. 9: Note the height of the Locator abutment in relation to the palatal tissue

Fig. 10: The Locator abutment for the Ankylos implant at right central incisor on the Locator placement tool

Fig. 11: Locator abutments placed on the implants at right lateral and central incisors

Fig. 12: The mismatched healing abutment has been removed from Branemark implant at the left lateral incisor and some inflamed tissue was removed with the Bident bipolar unit
attachment present on the Ankylos implant was removed and a Locator abutment with the lowest cuff height was placed on this fixture and tightened to 25 Ncm with a torque wrench.

The mismatched healing screw that the previous dentist had placed on left lateral incisor was removed using a 0.50" hex wrench. The initial attempt to insert the Locator abutment on this implant only allowed the abutment to insert less than half the needed depth. Placement of the mismatched healing screw had cross threaded the internal threading on this fixture (Figs 12 and 13). To correct this, a threading tap was gently inserted into the affected implant in a clockwise direction until resistance was met (Fig. 14). The tool was rotated a quarter turn counter-clockwise, then advanced clockwise until further resistance was met. The procedure was repeated until the tap had reached the bottom of the threaded channel in the implant, restoring the threads which had been cross-threaded. The Locator abutment was then inserted to full depth and tightened to 25 Ncm with a torque wrench (Fig. 15).

Radiographs were taken to verify full seating of the Locator abutments (Fig. 16). Male Locator attachments in metal housings were placed on the three implants (Fig. 17). The tissue side of the current denture was relieved with an acrylic bur over each attachment to allow full seating of the denture without contact to the attachments. The buccal flange of the denture was insufficient and would need to be extended in the area of the implants at upper right anterior (Fig. 18). An undercut was present on the buccal of the abutment at right lateral incisor due to its angulation that
would potentially lock the denture to the implant when the male portion of the attachment was picked up in the denture. A small amount of PVS putty was mixed (Correct Plus, Pentron Clinical Technologies, Wallingford, CT) and molded to block out the undercut present.

The author recommends in most situations picking up the Locator males individually. This will lessen the chances of excess acrylic locking the denture in place. But in this particular case, the attachments at 7 and 8 were adjacent to each other making pickup individually difficult. They would be picked up together and the deficient buccal flange added at the same time. Jet denture repair resin (Lang Dental, Chicago, IL) was mixed and the receiving area on the denture was wetted with Jet methylmethacrylate liquid to improve adhesion of the mixed luting resin. The mixed acrylic resin was placed into the receiving area of the denture. The denture was inserted and the patient guided into occlusion. Additional resin was placed into the buccal area at the flange with an instrument and the lip was used to mold and form the new flange. Following setting, the denture was removed and excess resin was removed from around the metal attachment housings and the added flange was contoured. The denture was reinserted to check retention on the two implants. The procedure was repeated to pickup the attachment at site 10. Final polishing of the denture was performed using acrylic polishers (Brasseler USA, Savannah, GA) (Figs 19 and 20).
CONCLUSION

When a patient presents with malpositioned implants, prosthetic challenges can complicate treatment. Alteration of the soft tissue may be necessary when the fixtures are exposed or to permit restoration when the fixtures are malposed.

The Bident bipolar surgical unit has been documented in the literature to be used in direct contact with the metallic without concerns for disturbing the fixtures integration. This unit is a modification of their neurosurgical surgical unit that has been the gold standard in neurosurgery, allowing delicate soft tissue incisions in wet fields with no lateral heat transfer that could cause tissue inflammation and the ensuing shrinkage. The Bident is ideally suited for the oral environment providing the practitioner with fine control of the soft tissue esthetics.

Ideally, in removable applications it is best to have the same attachment on each of the implants in the arch. This can be challenging when different implant systems have been placed in the arch. The Locator implant abutment is available for most implant system currently being offered by the various companies. This allows simplification of the prosthetics phase of treatment, making long-term maintenance less problematic.

Treatment of the implant at the left lateral incisor teaches an important lesson, that it is necessary to properly identify what implant is present prior to attempts to place prosthetic components. Otherwise damage can occur to the internal threading of the implant and make further restoration difficult or impossible.

Was the current treatment ideal? No. But the patients age and financial situation, combined with her goal of eliminating the use of denture adhesive to retain the denture, a service has been provided to improve the quality of her life.

REFERENCES