



Simplifying Implant-Retained Overdentures

New attachment system provides strength and wear-resistance for retention and stability

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Edentulous patients can experience greater stability, retention, and function with implant-retained removable prostheses, which also eliminate many problems associated with traditional dentures.¹ Non-splinted removable attachment systems have been widely adopted due to the smaller space requirements, technical simplicity, relatively lower costs, and research supporting superior clinical peri-implant hygiene.²⁻⁴ Unfortunately, when overdentures are retained by nonparallel implants, premature wear of attachment components, retention loss, and non-passive seating of the prosthesis have been observed.^{5,6} The replacing of insert housings and loosening of attachments have also been reported.⁷

When planning for overdentures, ideal implant position is not always possible. Implants originally intended to support fixed restorations are sometimes converted to overdenture attachments, but may not have been placed with parallelism in mind.⁸ Even when new implants are placed, anatomical and alveolar limitations sometimes dictate an off-angled position and orientation.⁹ Therefore, an attachment system that allows passive

overdenture insertion and removal while resisting component wear is needed.

Case Presentation

A 70-year-old partially edentulous male presented with failing remaining dentition (Figure 1). Implant-retained removable prostheses were selected as his definitive treatment plan. The most important factor for this treatment selection was the relative ease of oral hygiene access. The relatively low cost compared to fixed solutions was another consideration for the patient.

Clinical Protocol

The remaining dentition was extracted, and the immediate maxillary and mandibular dentures were inserted. After six months of tissue healing, a cone-beam computed tomography (CBCT) scan was obtained, and four implants in the maxilla and four in the mandible were planned using implant planning software (SIMPLANT®, Dentsply Sirona). A surgical guide was fabricated and used during the fully-guided maxillary surgery to ensure proper insertion and angulation of the maxillary

implants (Astra EV, Dentsply Sirona). The mandibular implants (Astra EV) were placed free-hand with only slight angulation, using the denture as a guide. A postoperative panoramic radiograph verified correct positioning.

Attachment System Selection

The LOCATOR R-Tx™ attachment system (Zest Dental Solutions, zestdent.com) was selected to allow easy alignment, seating, and removal of the overdentures; provide strength and wear-resistance for extended durability; and maintain retention and stability (Figure 2). Dual retentive surfaces on the abutment exterior eliminate the need for internal engagement, preventing debris and plaque accumulation from interfering with proper overdenture seating, while also contributing to peri-implant health.²

A channel inside the top of the housing enhances the pivot range of motion, making it ideal in cases with convergence or divergence between implants (ie, up to 60°). Since the four mandibular implants in this case were slightly angled, the pivoting inserts facilitated smooth engagement of the abutments for easier seating. The narrow, taper-like coronal abutment geometry would allow for easier alignment of the overdenture and proper insertion by the patient. Horizontal grooves and flats within the attachment housings resist vertical and rotational movement, ensuring the housings remain stable and in place.

Multiple layers of titanium carbon nitride and titanium nitride coat the abutment exterior, providing a harder, stronger, and more wear-resistant surface than the previous LOCATOR



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FIG. 1

(1.) Pretreatment retracted view of the patient's failing dentition. (2.) View of the LOCATOR R-Tx attachment system components: abutment, denture attachment housing, and retention insert.



FIG. 2

Abutment surface. This may mitigate wear of components and retention loss due to the repeated removals and insertions performed by the patient during his cleansing routines.¹⁰

Abutment and Attachment Placement

Using a periodontal probe, the gingival height was measured at the highest point, and the appropriate LOCATOR R-Tx Abutment was selected by identifying the cuff height corresponding to that measurement and the implant diameter.

The vial cap attached to the abutment was used as the initial abutment driver when the abutments were placed onto the implants, after which the standard .050"/1.25 mm hex driver—a universal implant driver—was used, and the abutments were hand tightened. Abutment seating was completed by tightening the abutments to 25 Ncm using a calibrated torque wrench as per the implant manufacturer's recommendation (Figure 3).

Block-out Spacers were placed around each abutment at tissue level, and the Denture Attachment Housings were pressed firmly onto each abutment, snapping into place (Figure 4). The overdentures were relieved at the abutment-housing sites until passively contacting ridge tissues. The housings were "picked-up" in very light occlusion, after which the overdentures were disengaged from the abutments. Excess "flash" was also removed.

The black Processing Inserts were removed from the Denture Attachment Housings using the removal end of the Retention Insert Tool, and they were replaced with blue Low Retention Inserts (Figure 5). The final overdentures were seated intraorally by pressing down to engage the new inserts onto the abutments, and the occlusion was verified (Figure 6).

Conclusion

At the insertion appointment, the prosthodontist and patient were satisfied with the stability, retention, and ease with which the patient could attach and remove the prostheses. Home care was discussed and explained thoroughly. At 1-week and 6-week follow-up appointments, evaluation of abutments, housings, and prostheses revealed desired functionality and no premature wear. The patient reported comfort, function, and complete satisfaction with how the attachment system enabled him to remove and reinsert the prostheses frequently throughout the day for



(3.) LOCATOR R-Tx abutments were selected based on measured tissue heights and implant diameters, then placed using a standard .050"/1.25 mm hex driver and tightened to the implant manufacturer's recommended torque. (4.) LOCATOR R-Tx retentive housings were placed on the abutments, then picked up in the dentures intraorally. (5.) View of the maxillary denture following pick-up of the Denture Attachment Housings and replacement with blue Low Retention Inserts. (6.) Post-treatment retracted view of the patient with final maxillary and mandibular full-arch implant-retained prostheses.

cleaning. The retentive inserts were replaced at the 6-month post-insertion appointment as planned. The LOCATOR R-Tx attachment system used in this case demonstrates clinical simplicity, passive seating, wear resistance, durability, and improved features for easy and predictable use. 🌟

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