

Case Series on Implant Supported Overdenture Prosthesis

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Abstract

The biggest problem of patients with total edentulism is the lack of retention and stabilization of their dentures and the insufficient chewing function. In these patients, implant-retained prosthetic treatment approaches provide function, phonation and aesthetic expectations. In this case series, the rehabilitation of two patients with 4 implants in the maxilla and 2 implants in the mandible with different implant-supported overdenture prosthesis planning is described.

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Key words: Dental-implant, locator, splinted prosthesis.

Introduction

For many years, the first treatment option in the treatment of completely edentulous patients has been classical complete dentures (1). Patients have difficulty in chewing and speaking when the retention and stabilization of classical dentures made with support from edentulous ridges is inadequate (2). In such cases, implant-retained prosthetic treatment approaches increase function, phonation and aesthetic expectations (3).

There are two different treatment options for completely edentulous patients: implant-tissue supported removable prostheses and fixed prostheses. The choice of treatment is based on the anatomical structure of the bone, the patient's expectations and economic situation. In addition, the relationship between the jaws, the distance between the arches, the arch shape and the lip line are among the factors that affect treatment planning (3,4). Ball, bar, locator, magnet or telescope-based systems are used to ensure retention in implant-supported removable prostheses (5,6).

In this case series, the rehabilitation of two patients with 4 implants in the maxilla and 2 implants in the mandible with different implant-supported overdenture prosthesis planning is described.

Case Report 1

A sixty-nine-year-old male patient without any systemic disease was referred to the Department of Prosthodontics after implant surgery. Intraoral examination revealed 4 implants in the upper jaw and 2 implants in the lower jaw of Medentika (Medentika, A straumann group brand, Germany) brand.

In the first session, alginate impressions were taken from the upper and lower jaw using a prefabricated spoon. The base was prepared with acrylic resin based on the obtained diagnostic model. Afterwards, closed impression pieces were placed on the implants and closed-tray impressions were taken with condensation reaction silicone (Zhermack-Zeta plus) impression material (figure 1). In the same session, the vertical dimension and the relationship between the jaws were recorded using the prepared base and wax rims. Afterwards, the multiunit and locator system was selected by evaluating the gingival heights, implant angles and the relationship between the jaws on the model. Open-tray impression posts were placed on the model and splinted together using dental floss and pattern resin (GC) (figure 2).



Figure 1: Closed-tray impression.



Figure 2: Open-tray impression preparation with pattern resin.

The selected multiunit system and locator system were placed by torque. Open-tray impression pieces splinted by pattern resin were screwed to the upper jaw. After the necessary checks were made, impression were taken from the upper jaw with additional type silicone impression material (Zhermack Eltie HD+). In the lower jaw, impression pieces were placed on the locator attachments and closed-tray impressions were taken with additional type silicone impression material. Before the bar attachment was designed, the patient's vertical dimension measurement and tooth try-in were carried out. With reference to the tooth arrangement, the bar attachment was designed to best fit the final prosthesis. The prepared bar system was checked and rehearsed with the Sheffield test (figure 3). Afterwards, the metal skeleton was rehearsed. At the finishing stage, the bar system was torqued to the upper jaw. In the lower jaw, the locator system was attached in the laboratory at the final stage (figure 4). Prosthetic edges were checked and occlusal adjustments were made.

The laboratory inserts in the prosthesis were replaced with inserts with appropriate retention. The prostheses were delivered to the patient and the patient was called for a check-up (figure 5).



Figure 3: Intraoral view of the bar attachment.



Figure 4: Placement of attachments within the prosthesis.



Figure 5: Intraoral view of the final prosthesis.

Case Report 2

A 72-year-old male patient with no systemic disease underwent implant surgery for total edentulism and was referred to the Department of Prosthodontics. Oral examination of the patient revealed 4 implants in the maxilla and 2 implants in the mandible.

At the same time, it was observed that the mandibular bone was highly resorbed while the bone volume was preserved in the maxilla. Considering the number of implants applied and the interocclusal distance, a locator-supported removable prosthesis was planned for the lower jaw and upper jaw.

In the first session, the first impression was taken with alginate impression material using a prefabricated spoon. After the diagnostic model was created, a personal spoon was prepared with acrylic resin. In the second session, closed impression pieces were placed and impressions were taken with condensation reaction silicone impression material. The vertical dimension and the relationship between the jaws were recorded with the prepared base and wax rims. Locator attachments were selected based on the model obtained, taking into account gingival heights, implant angles and the relationship between the jaws (figure 6).



Figure 6: Intraoral view of locator attachments.

A personal spoon was prepared based on the model. Afterwards, the selected locator attachments were torqued to the mouth. The edges of the personal spoon were shortened to 2 mm shorter than the sulcus depth with reference to the moving tissues in the mouth. Edge shaping was done on the shortened personal spoon using a thermoplastic impression material, stench (Kerr Impression Compound, Kerr Co., Orange, CA, USA). Then, impression pieces were placed on the locator attachments and impressions were taken with a closed-tray method using polyether (Impregum™ Penta™ Polyeter, 3M ESPE, Germany) based impression material (figure 7). Afterwards, vertical dimensioning and tooth try-in were carried out. The part of the locator system inside the prosthesis was connected in the laboratory at the final stage. Prosthetic edges were checked and occlusal adjustments were made. The laboratory inserts in the prosthesis were replaced with inserts with appropriate retention. The prostheses were delivered to the patient and the patient was called for a check-up (figure 8).

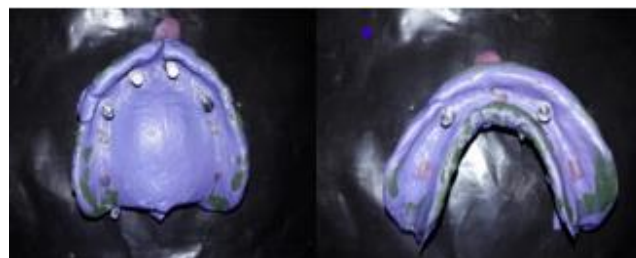


Figure 7: Closed-tray impression.



Figure 8: Intraoral view of the final prosthesis.

Discussion

As implant treatment has become an accepted treatment option over time, it has led to the emergence of different prosthetic options. Implant prostheses; It is divided into two: implant-supported fixed prostheses and implant-supported removable prostheses.

Implant-retained fixed prostheses are prostheses that provide great comfort to patients and feel close to natural teeth when applied under appropriate conditions. For their application, they require at least 4 implant supports and an interocclusal distance of at least 8 mm from the gum to the incisal edge. Implant-retained removable prostheses are one of the most successful treatment options for patients who complain about insufficient bone support and the retention and stability of the classical total prosthesis (7). According to Misch, there are some situations where implant-retained removable dentures have some advantages over fixed dentures. The fact that removable prosthesis applications can be applied with a small number of implants results in the need for fewer preprosthetic surgical procedures. This allows the localization of the implants to be decided more flexibly.

The edge extensions of removable dentures provide support to the soft tissues and lead to better aesthetic results. The fact that removable dentures are removable makes it easier for the patient to maintain oral and denture hygiene. Removing removable dentures while lying down reduces nocturnal parafunction movements and prevents stresses that have a destructive effect on the implants. Overdenture structure has a stress-reducing effect on implants because soft tissues serve as support for the prosthesis (6). Locator attachments help tolerate the angle of implants that cannot be placed parallel. They are preferred in patients with limited interocclusal distance due to attachment height options and retainer system principles. It is possible to increase retention by easily replacing inserts whose retention decreases over time (8). The disadvantages of the system are the inability to clean the attachments correctly and sufficiently in prolonged use, the decrease in the retention of the prosthesis by preventing the correct fit of the prosthesis, and rapid insert deformation due to the prosthesis not being placed in the same position continuously (8).

Bar attachments are preferred in cases where the number of implants cannot be provided for fixed prosthetic treatment, the lost soft tissue must be compensated and the retention requirement is high. In order to use this system, 13-14 mm must be provided between the implant platform and the incisal edge of the prosthesis, and at least 2 mm must be provided between the bar and the gingiva. An inadequate distance of 2 mm between the bar and the gingiva prevents the relevant area from being adequately cleaned (8).

While the construction of bar-retained prostheses requires technical precision, the process is complicated when repair is required. It is not indicated in cases where the distance between the jaws is not sufficient. Loosening of the retaining clips is a common complication. It may irritate the mucosa if it is not cleaned sufficiently (8). In addition to these disadvantages, the advantages of the system are that it has satisfactory retention with a small number of implants, that it can provide lip support to the patient by compensating for the lost soft tissue, and that the force transmitted to the implants is reduced as a result of splinting the implants with the bar system (8).

Addition type silicones and polyethers are two different impression materials that are indicated for use in implant-supported removable prosthesis cases. Studies have reported that these two measurement items do not occur a significant difference in measurement

accuracy (9). The reason why additive type silicone was used in case 1 and polyether in case 2 was that accurate measurement could not be taken due to the fluid nature of polyether triggering the nausea reflex of patient 1.

In the first case, a combination of bar and locator retained system was used due to adequate interocclusal distance, number of implants, smile line and economic reasons. In the second case, a prosthesis with upper and lower jaw locator retained prosthesis was preferred due to both insufficient interocclusal distance and satisfactory prosthesis retention due to low bone loss in the upper jaw.

Conclusion

The clinical success of implant-supported prostheses depends on the correct planning of the treatment, taking into account the anatomical characteristics and needs of the patients. In the follow-up of these two cases, since the patients had previously used traditional total dentures, the newly made implant-retained dentures had a satisfactory effect in terms of retention and stabilization. However, their primary complaint was loss of retention resulting from deformation of the inserts of the locator system. Although no complications were encountered in the bar prosthesis in the first 6 months, a longer follow-up period is needed to evaluate screw loosening, clip performance, and the need for repair in the prosthesis.

Informed consent was obtained from both patients, whose treatment process was explained, for the publication of the cases.

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