

A Technique for Constructing a New Maxillary Overdenture to a Nonretrievable Implant Connecting Bar

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The most frequent mechanical complications of the bar-implant-retained overdentures are loosening of the bar screws and the need to reactivate the retentive clips. This article describes a technique to construct a new maxillary overdenture to a nonretrievable round-profile implant connecting bar with 2 distally placed attachments. The retainer round-profile bar was nonretrievable due to a worn retaining screw head. Attachment transfer analogs are used to transfer the position of the attachments to the master cast. The technique allows the clinician to construct new overdentures without the need for removal of the implant connecting bar. Reduced chairside time, reduced treatment cost, and increased patient satisfaction are the major advantages of the technique.

Key Words: maxillary bar-implant-retained overdenture, attachments

INTRODUCTION

The use of dental implants for prosthetic rehabilitation of an edentulous jaw is a predictable and successful treatment modality.¹⁻³ With the advent of predictable implant support and retention, the implant-supported overdenture (IOD) has become an accepted treatment modality.⁴ A common form of this treatment modality is the use of an implant-retained bar to support an overdenture. This form of treatment is associated with a high patient acceptance rate because of increased denture retention and stability, increased biting efficiency, and improved quality of life.^{1,5,6} However, this form

of treatment has disadvantages and complications, such as prosthesis fracture, the extra bulk caused by the presence of the metal bar, and the need for frequent maintenance.⁷⁻⁹ In addition, lower success rates are reported for the maxilla, especially for the IOD treatment modality.^{8,10-15} In general, poor bone quality and bone volume, short implant length, and poor initial stability are factors associated with the lower success rate for implants in the maxilla compared with the mandible.¹⁶⁻¹⁸ Compared with fixed prostheses or mandibular overdentures, IODs in the maxilla require a considerable degree of postinsertion prosthetic maintenance.^{14,19} Most mechanical complications were found to occur soon after denture insertion and were easily resolved.^{8,15} Kiener et al²⁰ reported the effectiveness of maxillary IODs. During an average period of 3.2 years, the most frequent mechanical complications were loosening of the bar screws and the need to reactivate the retentive clips; during the first year, mucosal irritation and the need for

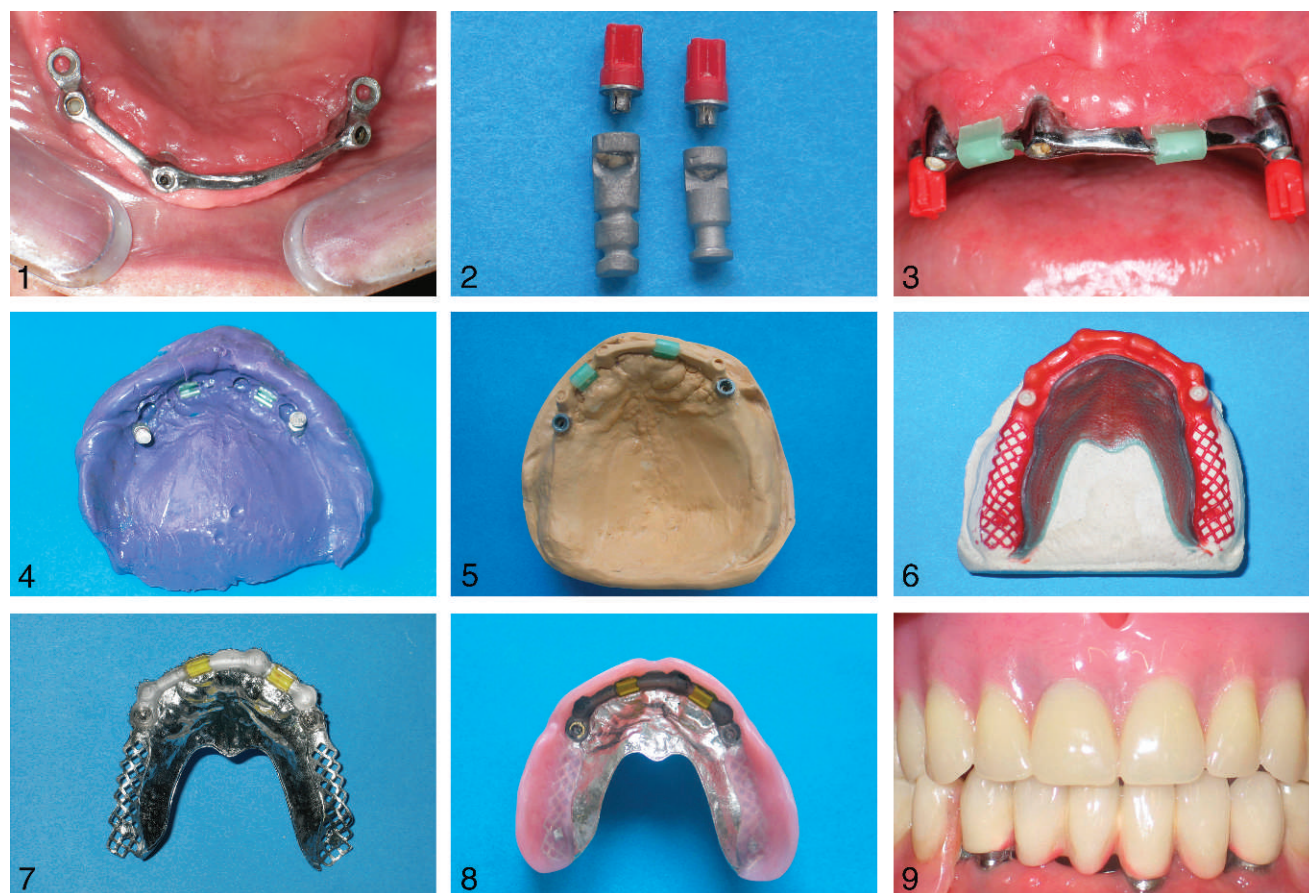
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FIGURES. 1–9. FIGURE 1. Intraoral view of the patient. **FIGURE 2.** Assembled dummy spring pins and impression tools. **FIGURE 3.** The assemblies seated on the matrices of the distally placed attachments and two duplicating matrices placed on the round-profile bar. **FIGURE 4.** Two matrix analogs placed into the maxillary impression. **FIGURE 5.** Two duplicating matrices placed on the maxillary cast. **FIGURE 6.** Wax-up of maxillary framework on the investment cast. **FIGURE 7.** Maxillary framework cast with a chrome-cobalt alloy. **FIGURE 8.** Intaglio view of the finished maxillary denture. **FIGURE 9.** Intraoral view of the patient after treatment.

occlusal adjustment were the most frequent findings.

This article describes a technique to construct a new maxillary overdenture to a nonretrievable round-profile implant connecting bar with 2 distally placed attachments (CEKA Classic, CEKA NV, Antwerpen, Belgium) (Figure 1) using attachment transfer analogs of a 65-year-old white man referred to the Prosthodontics Department of University of Ankara, Faculty of Dentistry, with the chief complaint of a fractured maxillary IOD. The round-profile implant connecting bar was nonretrievable because of a worn retaining screw head.

TECHNIQUE

The following steps were taken to construct the new IOD.

1. Make preliminary impressions of both arches with irreversible hydrocolloid (CA37, Cavex Holland B, Haarlem, Netherlands) using stock trays (Teknik Dis Deposu, Istanbul, Turkey). Pour the casts with type IV stone (BEGO, Bremen, Germany).
2. Prepare a maxillary acrylic resin custom tray (Paladur, Heraeus Kulzer GmbH, Hanau, Germany).
3. Assemble 2 dummy spring pins (CEKA Classic, CEKA NV) and impression tools (CEKA Classic, CEKA NV) (Figure 2) on the matrices of the distally placed attachments (CEKA Classic, CEKA NV) and check their fit. If there is a gap between the oral mucosa and the attachments, use dental wax (Cavex) to block out the tissue surfaces of the attachments.
4. Place 2 duplicating matrices (Vario-Soft-Bar-pattern vsp, Bredent, Senden, Germany) on

the round-profile bar (Figure 3). If there is a gap between the oral mucosa and the bar, use dental wax (Cavex) to block out the tissue surfaces of the bar.

5. After border molding (Impression compound, Kerr Italia SpA, Salerno, Italy), make the impression of the maxillae with a polyether-based impression material (Impregum, 3M ESPE, Seefeld, Germany). Incorporate 2 matrix analogs with the dummy spring-impression tool assembly (CEKA Classic, CEKA NV) (Figure 4). Pour the maxillary cast with IV stone (BEGO) (Figure 5). Place 2 duplicating dummies (CEKA Classic, CEKA NV) on the matrix analogs.
6. Wax up the maxillary framework (Figure 6) on the investment cast and cast it with a chrome-cobalt alloy (Biosil F, Degudent, Hanau, Germany). Remove the duplicating dummies. Solder 2 retention parts (CEKA Classic, CEKA NV) to the framework with a suitable solder (CEKA Sol, CEKA NV). Secure 2 male spring pins (CEKA Classic, CEKA NV) to the retention parts using a bonding agent (CEKA Bond, CEKA NV) (Figure 7).
7. Insert 2 matrices (Joint Snap-in, Bredent) into the framework to obtain the desired retention. Place the framework onto the bar and verify fit. Obtain horizontal and vertical maxillomandibular records with the framework and occlusion rims and transfer the casts to a semiadjustable articulator (Denar Advantage, Teledyne Waterpik, Ft Collins, Colo) using a face-bow transfer.
8. Select and arrange artificial teeth (Major, Major Prodotti Dentari, Torino, Italy) on the framework for a trial denture arrangement.
9. Evaluate the trial arrangement intraorally for esthetics, phonetics, occlusal vertical dimension, and centric relation. Make a protrusive record to set the articulator's condylar elements and obtain a balanced occlusal arrangement.
10. Process and finish the maxillary bar-implant-retained overdenture (Figure 8) and deliver it to the patient (Figure 9).

DISCUSSION

A technique for constructing a new maxillary overdenture to a nonretrievable implant connecting

bar was described in the current article. Treatment options for such a clinical case include sectioning and removal of the round-profile retainer bar and removal of the exposed retaining screws. However, this treatment option requires prolonged chairside time and increased expenses due to the remaking of the retainer bar. Advantages of the described technique include reduced chairside time, reduced treatment cost, and increased patient satisfaction. The disadvantage of the technique is the increased technique sensitivity. A final impression with great accuracy is required, and all the attachment assemblies should be carefully inserted into the impression and the framework to allow the bar-implant-retained overdenture to be fully seated. Detailed clinical studies are required to determine the further success of this treatment procedure.

SUMMARY

This article describes a technique to construct a new maxillary overdenture to a nonretrievable round-profile implant connecting bar with 2 distally placed attachments with the use of attachment transfer analogs. The round-profile implant connecting bar was nonretrievable due to a worn retaining screw head.

ABBREVIATION

IOD: implant-supported overdenture

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