

# A FUNCTIONAL IMPRESSION TECHNIQUE FOR AN IMPLANT-SUPPORTED OVERDENTURE: A CLINICAL REPORT

Bülent Uludağ, DDS, PhD  
Volkan Şahin, DDS

## KEY WORDS

Overdenture support  
Functional impression  
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overdenture

Overdenture support is derived from oral mucosa and retained roots or implants. Functional loads must be distributed, optimally, between the supporting structures for the success of overdentures; such a distribution may be obtained with the use of functional impression procedures. A functional impression technique is described for the fabrication of an implant-supported overdenture.

## INTRODUCTION

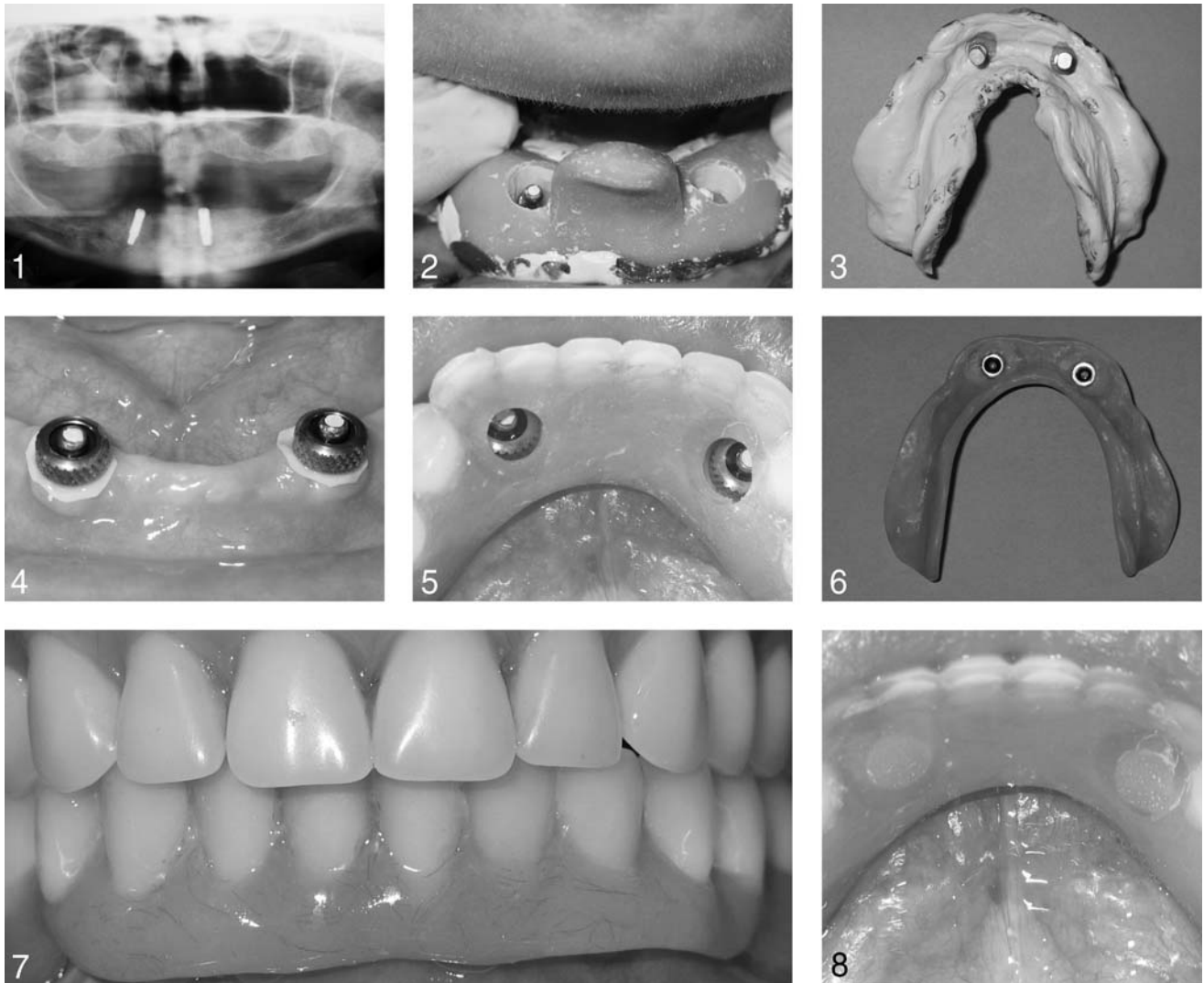
An overdenture may be defined as a removable prosthesis that covers the entire occlusal surface of a root or implant.<sup>1</sup> The primary advantages of overdentures are decreased resorption of the residual ridges, psychological benefits for the patient, and maintenance of masticatory performance.<sup>2</sup> Overdentures are different from conventional dentures in that the support can be derived from both the mucosa and retained roots or implants. Implant-supported overdentures have demonstrated clinical success with good long-term results.<sup>3,4</sup> The most common implant-supported overdenture design is supported by 2 splinted or free-standing implants placed in the interforaminal region.<sup>5,6</sup> Bars, O-ring attachments, and magnets can be used to provide retention for the overdenture, but the retention of

splinted implants to O-ring attachments and magnets has been shown to decrease over time.<sup>7</sup> For implant-supported overdentures to be successful, functional loads must be optimally distributed to the mucosa and abutments.<sup>8</sup> The overdenture impression must record the soft tissue-supporting areas simultaneously with accurate positioning of implant components.<sup>9</sup> This clinical report describes a patient treated with a mandibular implant-supported overdenture and describes the functional impression procedure for fabrication of the mandibular implant-supported overdenture.

## CLINICAL REPORT

A 50-year-old woman with poor retention of her mandibular complete denture was referred to the prosthodontics clinic of University of Ankara Faculty of Dentistry. In the initial clinical examination, the lack of retention of the

Bülent Uludağ, DDS, PhD, and Volkan Şahin, DDS, are with the Department of Prosthodontics, University of Ankara Faculty of Dentistry, Ankara, Turkey. Address correspondence to Dr Uludağ at Ankara Üniversitesi Diş Hekimliği Fakültesi, Protetik Diş Tedavisi Ab. D., 06500 Beşevler, Ankara, Türkiye (e-mail: uludag@dentistry.ankara.edu.tr).



FIGURES 1–8. Figure 1. Panoramic radiograph of patient after placement of implants. FIGURE 2. Custom acrylic tray. FIGURE 3. Definitive impression of mandible with implant analogs in place. FIGURE 4. Intraoral view of O-ring abutments and metal housings before application of autopolymerizing acrylic resin. FIGURE 5. Mandibular overdenture in place with openings for placement of metal housings. FIGURE 6. Intaglio surface of completed mandibular overdenture. FIGURE 7. Intraoral view of completed dentures. FIGURE 8. Intraoral view of completed mandibular overdenture.

mandibular denture was found to be due to the resorption of the alveolar ridges. Bony undercuts were noted in the anterior maxillae. After clinical and radiographic examination, the patient was offered various implant treatment options, including fixed and removable dentures, but because of financial restrictions a treatment plan was developed that included placement of 2 implants in the interforaminal region to provide retention for the mandibular denture.

Implants with a diameter of 3.5 mm and a length of 12 mm (3512D3, BioHorizons Implant Systems Inc, Birmingham, Ala) were placed (Figure 1). After a 3-month healing period, the implants were exposed and O-ring abutments were inserted (263-002, BioHorizons Implant Systems). Preliminary impressions were made with irreversible hydrocolloid (CA 37, Cavex Holland BV, Haarlem, Netherlands) and custom acrylic resin trays (Paladur, Heraeus Kulzer

GmbH & Co KG, Hanau, Germany) were prepared for the fabrication of the dentures. A mandibular custom acrylic resin tray (Paladur) was prepared with minimal relief and without perforations to record the alveolar mucosa in a functional state; openings only in the the region of the implants were prepared for the impression of the attachments.

After border molding with modeling plastic impression compound (Kerr Italia S. p. A., Sa-

lerno, Italy), the impression of the alveolar mucosa was made with a ZOE impression paste (Cavex Outline, Cavex Holland BV) under firm finger pressure applied to the molar region (Figure 2). After removal of the excess impression paste, the impression of the O-ring abutments was made by injecting low viscosity vinyl polysiloxane impression material (Oranwash L, Zhermack, Badia Polesino, Italy) through the openings. A functional impression of the mandible was made by combining both procedures (Figure 3). For the maxilla, border molding was accomplished with modeling plastic impression compound (Kerr), and the final impression was made with a ZOE impression paste (Cavex Outline).<sup>10</sup> After conventional occlusal registration procedures, the dentures were fabricated, and the maxillary complete denture was finalized with an open anterior flange due to the bony undercut area.<sup>10</sup> An examination glove (Top Glove, Top Glove SDN, BHD, Klang Selangor D. E., Malaysia) was cut into pieces to be placed between the O-ring abutments and metal housings. This procedure was used to eliminate the undercut areas between the O-rings and the metal housings (Figure 4). The mandibular overdenture was completed with openings in the regions of the O-rings (Figure 5); metal housings were incorporated in the denture using autopolymerizing acrylic resin (Paladur) (Figure 6). The patient was recalled the day after insertion of the dentures. Minor adjustments were made,

and the patient was given instruction in cleansing the dentures and was shown how to brush them with a soft bristle toothbrush and soap. The patient has worn the dentures for 6 months without any complaints (Figures 7 and 8).

#### DISCUSSION

Several 2-stage impression procedures have been described for the fabrication of conventional overdentures and implant-supported overdentures.<sup>8,9</sup> These methods have focused on the relation between the soft tissue-supporting structures and the hard tissue of the retained roots or implants. The procedure described in this article is a 2-stage impression technique that records the alveolar mucosa in a functional state and implant components accurately. The main advantage of this technique is the decrease in post-insertion adjustment. The disadvantage of this technique is that it is more involved and time-consuming compared with single-stage techniques. Although no body of evidence has documented the outcomes of 2-stage impression procedures for implant-supported overdentures, these procedures should be taken into consideration because of the nature of the support derived.

#### SUMMARY

In this article, a functional impression procedure is described to fabricate an implant-supported mandibular overdenture. This 2-

stage impression technique records the alveolar mucosa in a functional state and the implant components accurately.

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