

A Functional Open-Tray Impression Technique for Implant-Retained Overdenture Prostheses

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Several implant impression techniques with different materials have been described in the literature. Generally, border molding, functional, and final impressions have been made with 3 different materials, which makes the procedure technique-sensitive and time-consuming. A combination of open-tray and functional impression techniques is described in this technical report. Border molding and functional impression procedures are made at the same time using a vinyl polysiloxane impression material, which makes this technique a simple and time-efficient alternative for clinicians.

Key Words: *implant, functional impression, open-tray*

INTRODUCTION

Obtaining accurate impressions of implant position and the surrounding hard and soft tissues are paramount for fabricating esthetic and biologically functional restorations.¹ An inaccurate impression might result in an ill-fitting prosthesis, which may lead to mechanical and/or biological complications. Screw loosening and fracture, implant fracture, and occlusal instability have been reported as mechanical complications occurring due to prosthesis misfit.²⁻⁵ Biologically, marginal discrepancy from misfit might cause unfavorable soft- and/or hard-tissue responses arising from increased plaque accumulation.^{6,7} Even though it is not possible to obtain absolute passive fit,⁸ minimizing the misfit to prevent possible complications is a generally accepted goal of prosthodontic implant procedures.

Implant retained overdentures are supported by 2 structures that have different resilience: the implants and the soft tissues. Consequently, the difference in resilience between implant and

mucosa should be considered for the impression of implant-tissue supported overdentures.^{9,10} The functional impression technique records the mucosa in a functional fashion and simultaneously records the implant components along with the alveolar tissues. The major advantage of this technique is that it provides an accurate relation of the implant components and the supporting tissues.¹⁰

Functional impression techniques for implant-retained overdentures have been reported in the literature.^{10,11} In these studies, border molding, functional, and definitive impressions have been performed using 3 different materials. These different steps make the procedure complex, technique sensitive in recording the border relation with different impression materials, and more time consuming compared with a single-stage impression technique.

A combination of open-tray and functional impression techniques is described in this technical report. This combined technique has some advantages over previous techniques. Border molding and functional impression procedures are made at the same time with the use of a vinyl polysiloxane (VPS) impression material that has been previously recommended for this application.¹² This combined technique appears to

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DOI: 10.1563/AAID-JOI-D-10-00159

provide a simple and time-efficient alternative for clinical practice.

PROCEDURE

Following is a description of the 9-step procedure:

1. Make an irreversible hydrocolloid (Cavex outline, Cavex Holland BV, Haarlem, Netherlands) preliminary impression of the arch with healing abutments (T4 4853, Nucleoss, Şanlılar Tıbbi Cihazlar medical Kimya San Tic Ltd Şti, İzmir, Turkey) in place after healing from second-stage surgery. Fabricate an individualized acrylic resin tray (Imibase, Imicryl Dis Malzemeleri ve San ve Tic Ltd, STI, Konya, Turkey) on the resultant cast and prepare a mandibular custom acrylic resin tray, leaving an opening in the areas of the implants. The edentulous portion of the tray needs to be prepared without holes for pressure application during the functional impression.

2. Remove the mandibular implant healing caps (T4 4853, Nucleoss) and screw impression copings

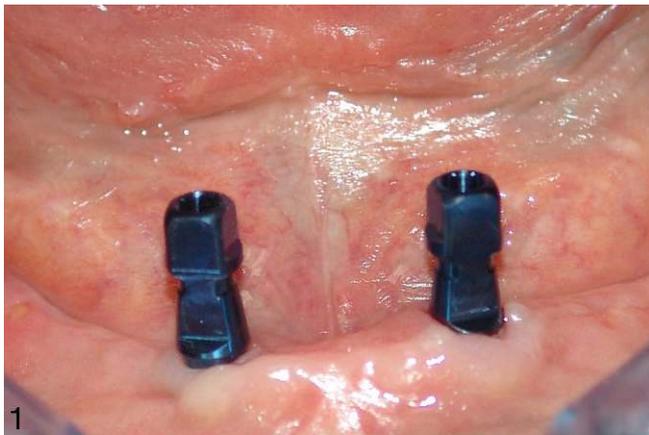
(T4 4840, Nucleoss) onto the implants (T4 4212, Nucleoss) (Figure 1). Close the access openings of the impression copings (T4 4840, Nucleoss) with provisional restorative material (Cavit, 3M ESPE, Seefeld, Germany).

3. Evaluate the custom acrylic resin impression tray intraorally. Be sure that it is well adapted and that all the impression copings (T4 4840, Nucleoss) project through the openings and are not in contact with the acrylic resin tray.

4. Remove the tray and use VPS adhesive (Trayloc A, Detax, Ettlingen, Germany) to paint the inside and border of the tray.

5. Make the border molding and functional impression of the alveolar mucosa with putty functional impression material (Detaseal function, Detax, Ettlingen, Germany) simultaneously using finger pressure. Allow the impression to fully polymerize (Figure 2).

6. Remove the mandibular tray from the mouth



FIGURES 1–4. **FIGURE 1.** Implant impression copings screwed onto implants. **FIGURE 2.** Functional impression of the mandibular arch. **FIGURE 3.** Impression copings held rigidly by the tray with the help of autopolymerizing acrylic resin. **FIGURE 4.** Definitive impression of the mandibular arch.

and clean the excess impression material from around the implant copings.

7. Inject medium-bodied VPS impression material (Monopren transfer; Kettenbach GmbH & Co KG, Eschenburg, Germany) around the impression copings near the gingival tissues. Have an assistant fill the tray with medium-bodied VPS impression material (Monopren transfer; Kettenbach GmbH & Co KG, Eschenburg, Germany) in all areas. Place the loaded tray intraorally again and ensure proper seating.

8. Upon completion of the impression procedure, apply autopolymerizing acrylic resin (Pattern Resin LS, GC America Inc, Alsip, Ill) around the impression copings using a bead-brush technique.

9. Remove the impression coping screws (T4 4840, Nucleoss) and the impression after polymerization of the acrylic resin. Ensure that the impression copings are held rigidly by the tray (Figures 3 and 4). Then disinfect the impression and place the analogs (T4 4020, Nucleoss) in the impression copings (T4 4840, Nucleoss). Fabricate the master cast using conventional means.

ABBREVIATION

VPS: vinyl polysiloxane

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