

AN IMPRESSION TECHNIQUE TO ACCURATELY TRANSFER SOFT TISSUE CONTOURS FOR IMPLANT-SUPPORTED RESTORATIONS: THREE CASE REPORTS

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KEY WORDS

Soft tissue
Dental implants
Titanium
Bone loss

This article describes an alternative method for making an impression of implants that will simultaneously capture the soft tissue contours accurately. This customizing of the pick-up impression technique is specifically useful for aesthetic areas.

INTRODUCTION

Custom-guided tissue healing is the most predictable way to achieve optimal results. The emergence profile healing abutment works well in expanding soft tissue after stage II surgery, but after sculpting the tissue with a provisional restoration, the round impression coping does not transfer this shape to the impression. In 1995, Jansen suggested making 2 provisional restorations and using 1 of them as a pick-up impression coping, but with this technique the clinician must fabricate 2 identical provisional restorations.¹ In 1997, Hinds demonstrated how to fabricate a custom impression coping after stage II healing expansion.² Custom-guided tissue healing is the most predictable way to achieve optimal results. Three case reports will be presented to demonstrate this technique.

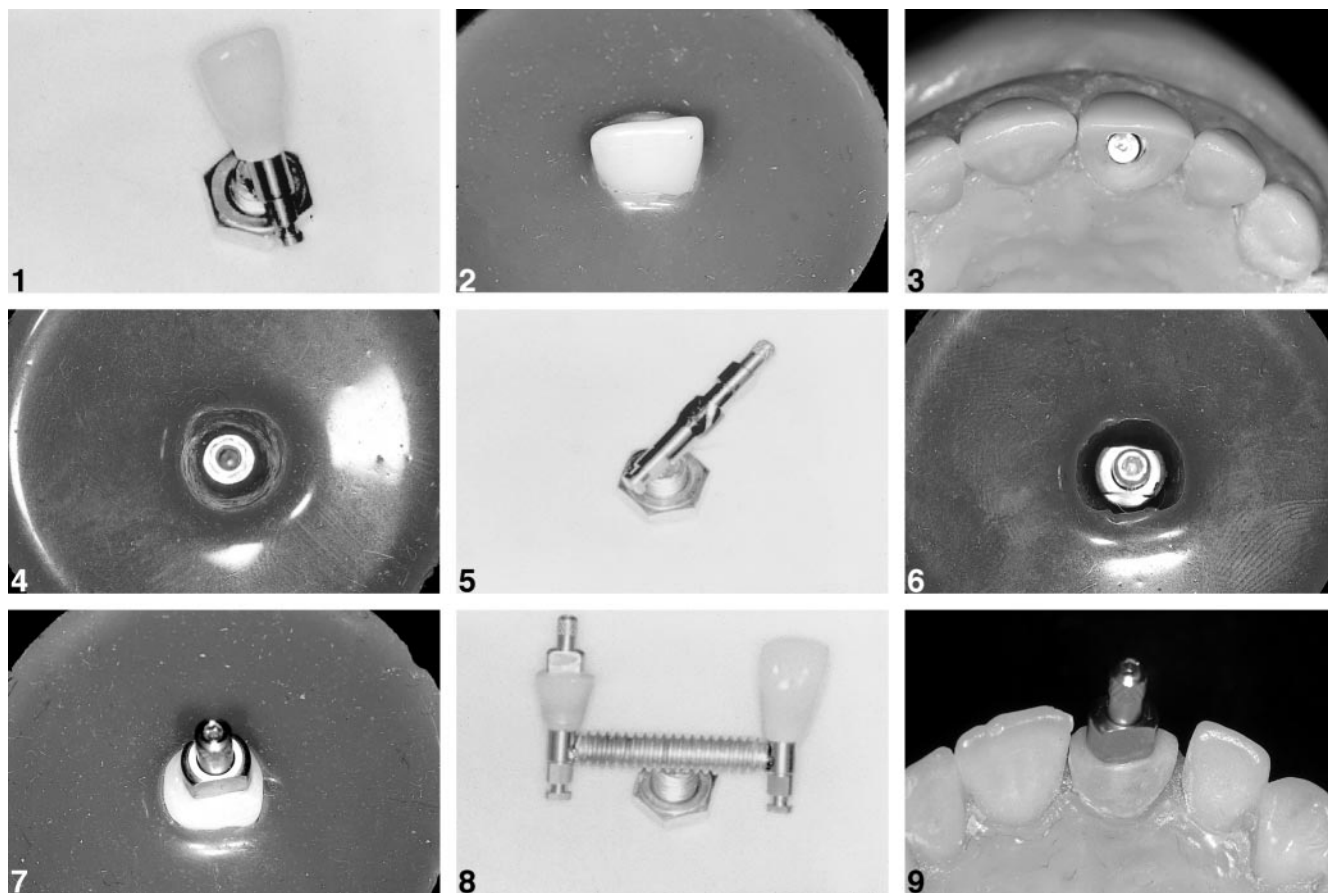
MATERIALS

The following materials are used during this procedure: impression material (polyether); pick-up-type impression coping; implant laboratory analog; small plastic container; acrylic or composite; acrylic provisional; and plastic impression tray.

METHODS

After the implant has been properly placed and a provisional abutment/crown has been put into position, a final impression can be made. The provisional complex is unscrewed and a laboratory analog is attached to it (Figure 1). A polyester impression material is mixed and placed into a small plastic container. The provisional-analog system is then submerged into the container before the material sets, leaving one-third of the system exposed (Figure 2). The emergence profile of the

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FIGURES 1-9. FIGURE 1. The provisional prosthesis is connected to the laboratory analog. FIGURE 2. The provisional crown/system is submerged into the impression material. Although the contour is recorded, one-third of the complex is allowed to register. FIGURE 3. The provisional prosthesis is reinserted into the mouth to prevent soft tissue collapse. FIGURE 4. The provisional prosthesis is captured in the impression. FIGURE 5. The surface of the impression coping is roughened to hold the filling material. FIGURE 6. The pick-up impression coping without resin is showing space of the soft tissue contour. FIGURE 7. The impression coping is surrounded with composite material. FIGURE 8. The provisional prosthesis and the custom impression coping showing the same emergence profile in one-third of the complex. FIGURE 9. The custom impression coping intraorally is showing absence of any void.

provisional is then captured in the impression (Figure 3).

Once the polyether has set, the provisional is unscrewed and reinserted into the implant in order to prevent any collapse of the gingivae (Figure 4). A pick-up impression coping is fastened to the implant laboratory analog (Figure 5) after the surface is roughened with a round carbide bur in order to hold the filling material (Figure 6). It is placed back into the polyether mold, and composite material in a syringe is injected around the impression coping; it is allowed to set, thereby stabilizing it (Figure 7). The customized impres-

sion coping is then removed and polished (Figure 8).

Next, the custom-impression coping is placed onto the implant intraorally without absence of a void (Figure 9). However, there will be a gap between the pick-up impression and the soft tissue contour in the model (Figure 10). A periapical X ray is taken to verify complete seating over the implant. A standard pick-up impression is then made using an open-tray technique (Figure 11).

The impression is poured and the final model will be an exact replica of the patient's soft tissue, which had been scalloped by the provisional com-

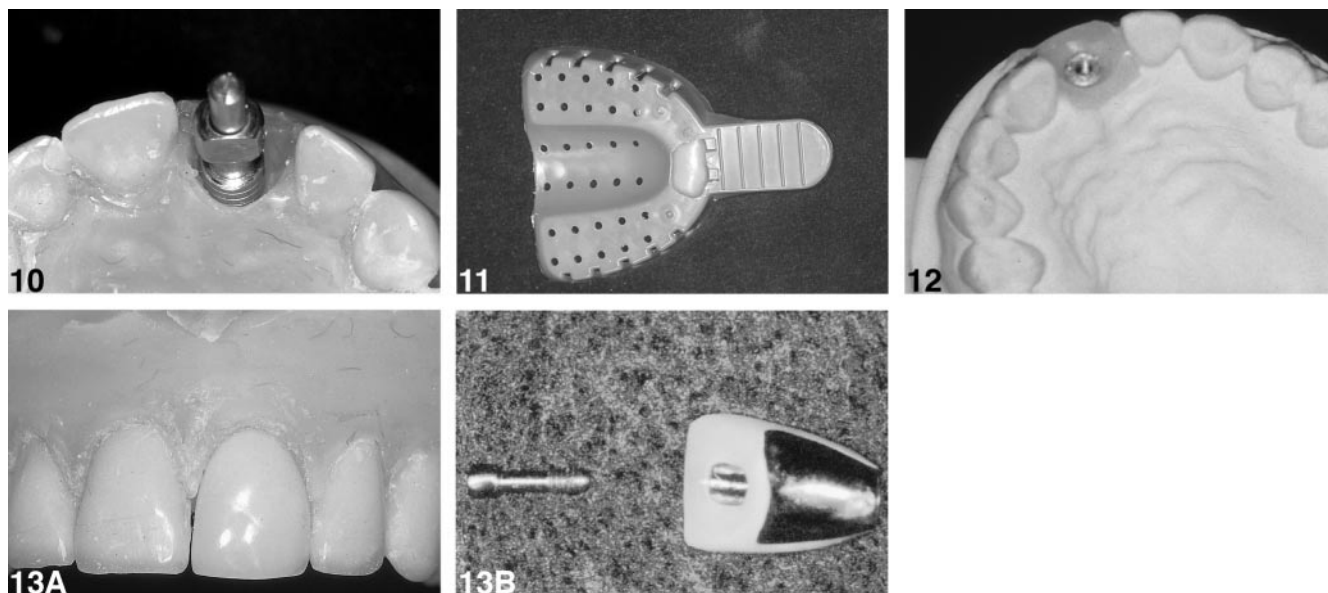
plex (Figure 12). The final restoration is fabricated with the same emergence profile as the provisional restoration presented (Figures 13A and B).

CASE REPORTS

Case 1

A 34-year-old patient presented for treatment of a fracture of the crown of tooth 9 with continued pain on function, even after endodontic treatment. A provisional prosthesis was fabricated and bounded with the adjacent teeth.

The quantity of gingival tissue before implant placement around a tooth scheduled for extraction can be increased by a procedure called "spon-



FIGURES 10–13. FIGURE 10. The no-custom impression coping is showing the void. FIGURE 11. The open tray for standard pick-up impression. FIGURE 12. The final tissue model. Replica of the soft tissue profile. FIGURE 13. (A) The final crown in position. (B) The final restoration in titanium cast.

taneous incite gingival augmentation.³ This technique is characterized by reducing to the level of a residual root a tooth planned for extraction. Coverage by gingival tissues is achieved within 3 to 4 weeks. The actual procedure was performed by reducing the tooth to a level 2 to 3 mm below the crestal bone. Three weeks later, gingival tissues were found to be covering the root. This procedure offered sufficient soft tissue to encourage subsequent primary closure (Figure 14). At the time of extraction, the provisional crown was modified to assist in recontouring the papillae.

After 2 months, an implant, 4.0 mm/13 mm (Steri-Oss, NobelBiocare, Yorba Linda, Calif), was placed and an impression made to permit the delivery of a provisional crown at stage II (Figure 15).

Six months after implant placement and initial integration, stage II surgery was performed. An anatomic abutment was inserted during the uncovering and the flap was advanced to cover it (Figure 16). It was anticipated that the clot-filled space created beneath the flap would develop into con-

nective tissue, thereby offering a desirable emergence profile.⁴

At the time of the final impression, the technique to transfer the soft tissue contour for fabrication of the final restoration was performed following the procedure described in “Methods.” The final restoration was fabricated with the same subgingival profile as the provisional restoration demonstrated (Figure 17).

Case 2

A 20-year-old patient presented with a condemned root of tooth 9 (Figure 18). The described Langer technique was performed in order to allow for soft tissue overgrowth. After study models were made, a removable provisional prosthesis and a surgical template were fabricated.

The patient presented with a bone defect prior to tooth removal. At the time of extraction, a peristome was used to preserve the residual buccal plate and a guided bone regeneration (GBR) technique was performed with a resorbable membrane placed over the graft. Primary closure was achieved so

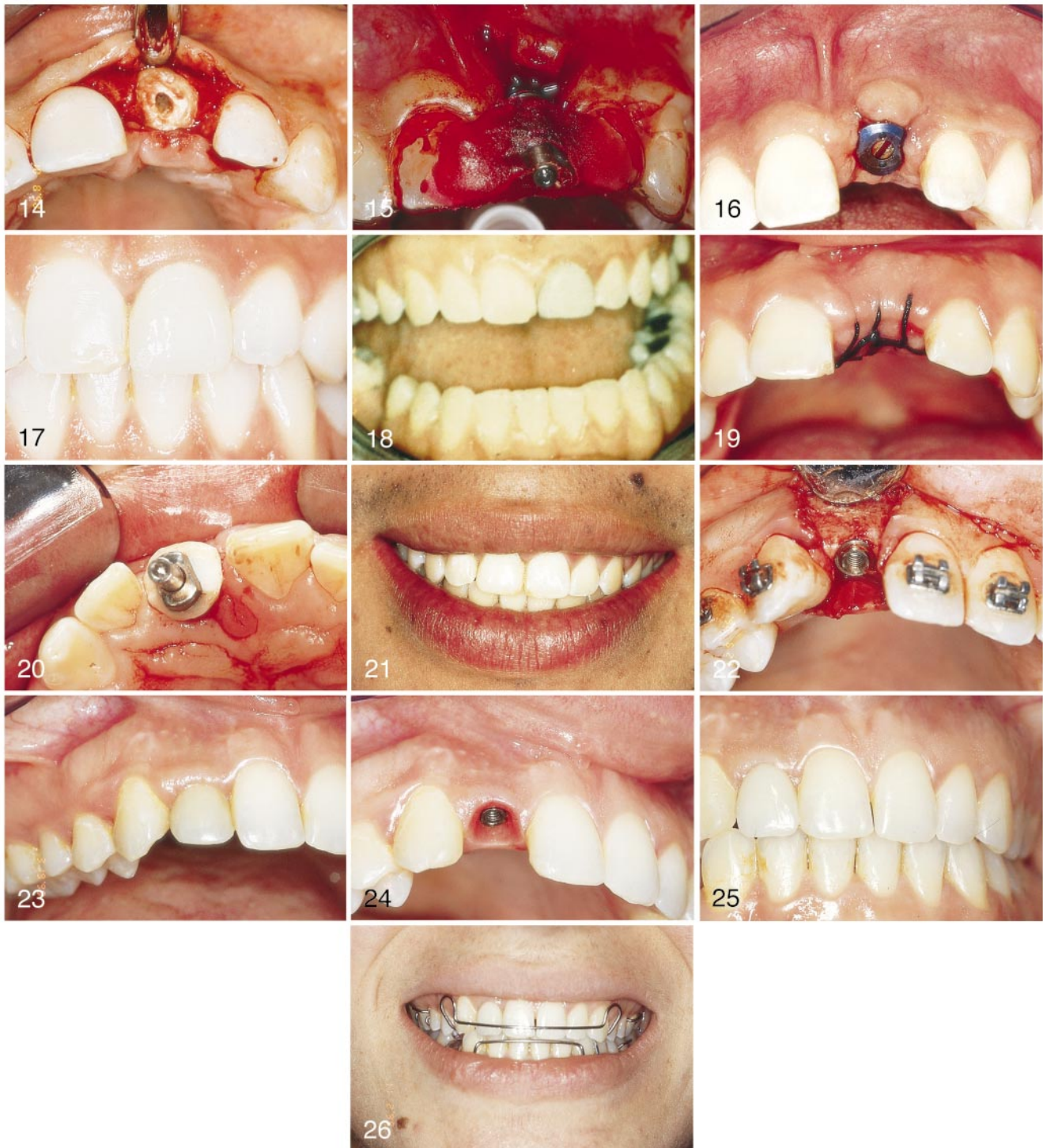
that the flap remained in a tension-free condition (Figure 19).

A 4.0 mm/13 mm implant (3I-Implant Innovations, Palm Beach Gardens, Fla) was placed in an ideal position 6 months after the extraction and grafting.

During stage II surgery, the impression was made and the healing abutment inserted. A roll technique was performed by dissecting the palatal connective tissue from the internal aspect of the palatal flap. This pedicle remained continuous with the labial flap and added bulk when it was rolled to the facial aspect.⁴

The healing abutment was left in place for 2 weeks, allowing the initial soft tissue to mature.^{5–9} Two weeks later, it was removed and the provisional crown was connected, thus completing the reshaping of the soft tissues.

The provisional crown was adjusted for aesthetics, occlusal scheme, and function. The final impression was made using the customized impression coping (Figure 20). The special abutment was placed and a Procera crown restoration with a desirable aesthetic result was completed (Figure 21).



FIGURES 14–26. FIGURE 14. The Langer’s technique reduces the root below the crest bone. FIGURE 15. The implant in position and the impression that was taken at stage I surgery. FIGURE 16. The anatomical healing abutment was placed for 2 weeks. FIGURE 17. The final restoration of tooth 9. FIGURE 18. The condemned tooth 9. FIGURE 19. Following the extraction, filling with bone substitute and primary closure was obtained. FIGURE 20. The customized impression coping was placed in the mouth for final impression. FIGURE 21. The smile of the patient with the final crown restoration in position is shown. FIGURE 22. The incision preserving the papillae was made and the implant was placed. FIGURE 23. The provisional prosthesis was placed in position to establish the contour of the soft tissue. FIGURE 24. The proper contour of the soft tissue after 4 weeks. FIGURE 25. The final restoration. FIGURE 26. The smile of the patient, upon completion.

Case 3

A 20-year-old patient presented with a congenitally missing tooth 7. Orthodontic treatment was performed for 8 months to re-establish the mesiodistal space. At stage I surgery, an incision was performed to preserve the papillae.

A machined-surface titanium implant, 3.25/13 mm (NobelBiocare), was placed at the site of the lateral incisor (Figure 22). An impression was made at stage I in order to allow delivery of the provisional crown during stage II surgery.¹⁰

Six months following surgery, the implant was exposed. The incision was performed again, preserving the papillae. The buccal flap was reflected. As suggested by Tarnow et al,⁵ in single-tooth replacement if the proximal teeth are less than 6 mm apart, the incision is made mesiodistally through the crevicular gingival, thereby preserving the facial-lingual dimension of the papillae and including them as a part of the facial flap. However, as in this case, the teeth were more than 6.0 mm apart. Therefore, the papillae were left in place and access was achieved by the use of vertical relieving incisions.

The prefabricated provisional crown was placed after all adjustments had been completed, and the contours of the soft tissue were developed by its

placement after 4 weeks (Figures 23 and 24).

The final prosthesis was delivered with an aesthetic result (Figures 25 and 26). Light centric contact was permitted, which was pleasing to the patient, and excursive contact was eliminated by using the adjacent teeth for guidance.

CONCLUSION

This impression technique allows the laboratory technician to fabricate a final restoration that, as described in these 3 reports, replicates the subgingival profile influenced by the provisional restoration. Customizing the pick-up impression technique assists in attaining excellent aesthetics.

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