

Developing a Fixture Level Cast for Implants with Interfering Axial Convergence

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Abstract

This article presents a novel technique for developing a master cast for two implants which are clinically placed convergent and very close to each other. The technique consists of making an implant level impression using a transfer coping for the posterior implant. Then fabricate a positional index intraorally, which contains a registration of the second transfer coping, the healing abutment reattached from the transfer in the impression and the adjacent teeth. The master cast is altered, using this positional index to incorporate the second implant analog.

Introduction

Acceptable function and esthetics of an implant restoration is dependent on many factors including ideal soft tissue environment and an ideal placement of the implants during surgery.¹ Occasionally, implants are located very close to each other and at various angulations due to anatomic limitations or technical obstacles.² In the case described in this article, an adequately constructed surgical template was used to prepare the initial pilot sites, but the implant diameter osteotomies were enlarged to 6 mm as permitted by ridge width.

An implant level cast is desirable to fabricate an implant-retained restoration.³ Making an impression using implant impression copings can be quite

challenging when implants are critically close to each other.⁴ Michalakakis, et al., described a technique for making an impression of dental implants in close proximity to each other by modifying one of the impression copings.³ Manufacturers have created special copings which are readily alterable for this purpose.⁵ An alternative technique to obtain an implant level cast for wide diameter implants, which are in close converging proximity to each other, is described below.

Technique:

1. Intraorally, place a closed-tray impression coping (Zimmer Dental, Inc., Carlsbad, CA) on the distal implant and secure it using accompanying screw.
2. Retain the healing abutment on the mesial implant. Ascertain that the impression coping and healing abutment do not touch.
3. A stock tray is used to make an impression with medium body vinyl polysiloxane (Aquasil, Dentsply Caulk, Milford) impression material.
4. Remove the impression coping from the distal implant and replace the healing abutment.
5. Attach an implant analog (Zimmer Dental, Inc., Carlsbad, CA) to the impression coping and carefully place it in the impression.
6. Place the gingival mask material (Vestogum; 3M ESPE) around the implant analog (Zimmer Dental, Inc., Carlsbad, CA) and the registration of the mesial healing abutment. Pour the impression with type III dental stone (Whip-mix, Louisville, KY). Obtain a cast with one implant analog (**Figure 1**).
7. Intraorally, remove the healing abutment from the mesial implant and place an impression coping and secure it with the accompanying screw. Retain the healing abutment on the distal implant. Ascertain that the impression coping and healing abutment do not touch.
8. Adapt light cured resin (Triad, Dentsply Caulk, Milford, CT) to the teeth and around the impression coping on the mesial implant and rest it on the healing abutment of the distal implant.
9. Cure in the mouth with a hand-held curing light to polymerize. Unscrew the fastening screw for the impression coping and remove the assembly from the mouth (**Figure 2, 3**).
10. Alter the cast with a 701 fissure bur (Brasseler USA, Savannah, GA) in the area of the mesial implant, allowing for enough space to attach the accompanying implant analog.
11. Attach the analog to the impression coping and reposition the triad index on the cast and fill the voided area with type III dental stone (Whip-mix, Louisville, KY) (**Figures 4, 5**).

Figure 1



Cast with distal implant analog.

Figure 2



Triad index fabricated intraorally.


Figure 3



Triad index with the impression coping.

12. Send the cast to the laboratory for fabrication of custom abutments and single porcelain fused to metal crowns (**Figure 6**).

Discussion

This technique can help the practitioner successfully obtain an implant level cast and fabricate an implant supported restoration for wide platform convergent implants placed in close proximity to each other. 

Acknowledgement

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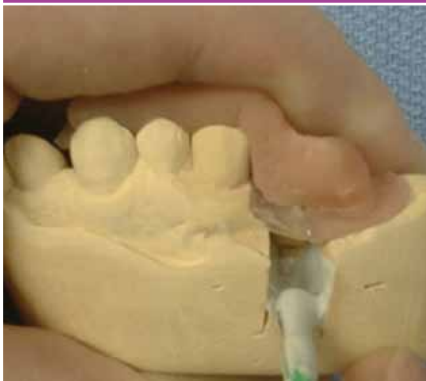
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Figure 4



Filling back the cast with stone.

Figure 5



Altered cast with both the implant analogs.

Figure 6



Implant supported single crowns fabricated over the implant.

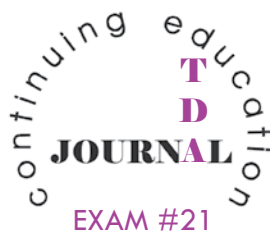
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1. The major considerations for implant restorations include:
 - a. esthetics
 - b. function
 - c. ideal soft tissue environment
 - d. all the above
2. Implants should be placed:
 - a. with concern for tissue
 - b. with concern of inter-implant distance and angulations
 - c. quite close to each other at various angulations
 - d. both a and b
3. Implant restorations can be fabricated:
 - a. by developing a fixture level cast
 - b. by developing an abutment level cast
 - c. both a and b
4. Wide diameter implants should not be used:
 - a. when there is insufficient mesio-distal space
 - b. when the nerve is 16mm from the crest of the alveolar bone
 - c. to replace mandibular posterior teeth
 - d. when there is sufficient bone available
5. Fabrication of restorations for non-parallel implants that are in close proximity to each other can complicate:
 - a. impression making
 - b. fabrication of restorations
 - c. use of stock abutment
 - d. all of the above

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