



A Three-Visit Digital-Analog Technique for Fabricating Implant-Retained Overdentures Using Metal Housings As Scan Bodies: A Case Report

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INTRODUCTION

With the advancements in digital dentistry, the analog methods of overdenture fabrication have been enhanced by digital workflows, making it more efficient and precise.¹ Locator scan bodies are available for digital impressions. Locator scan bodies provide us the precise positioning of the implants and helps the lab to provide enough spacing in the processed denture base for intra oral housing pick up.²

OBJECTIVES

This study introduces a digital-analog method for producing implant-retained overdentures (IRODs), in three visits, employing metal housings as scan bodies. These housings act as markers during scanning, enabling precise mapping of implant positions and angulations.

METHODS

This is a case report of 74-year-old male patient who presented with maxillary and mandibular conventional complete dentures (CDs) (Fig 1). The patient complaint of “too much plastic in his mouth” and “unable to chew well.” Patient’s past dental history included maxillary and mandibular eight implant-supported fixed complete denture prostheses.

Upon intraoral examination, maxillary and mandibular arches noted with healing abutments on implant sites, #2, 8, 9,15, 18, 23, 27, & 31; and locator abutments on implant sites, #3, 5,11,14, 19, 22, 26, & 30.

Treatment options including removable and fixed implant-supported prostheses were discussed with patient. Patient opted to receive 4-implant-retained overdentures on maxilla and mandible.

VISIT 1: Evaluation and Intraoral Scan

1. Patient’s existing CDs were assessed. Based on the factors established by Sato et al, vertical dimension of occlusion (VDO), anterior tooth arrangement and stability were deemed acceptable.³ However, the dentures were not retentive and had non-balanced occlusion.
2. Both the intaglio and ontaglio surfaces of these dentures were scanned using an intraoral scanner (Neoscan 1000, Neoss Inc. Waltham, MA) (Fig 2a & 2b).
3. Metal housings were affixed to locator abutments.
4. Maxillary and mandibular arches were scanned (Fig 3a & 3b).



Figure 1. Existing Conventional CDs

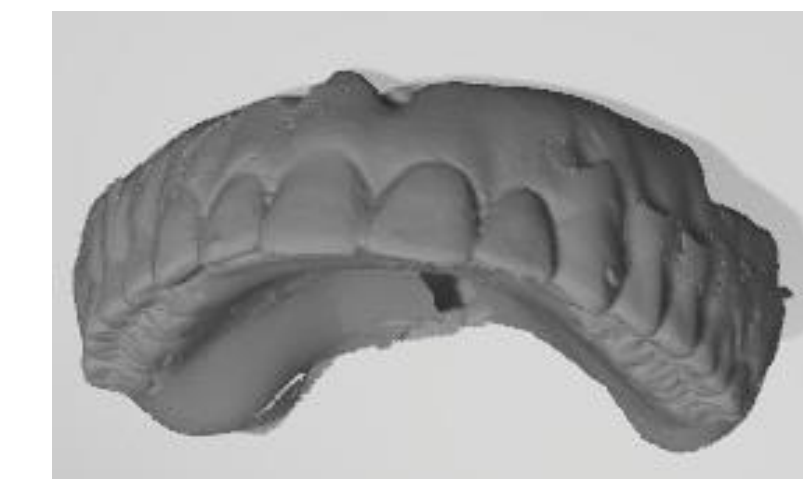


Figure 2a. Scan of patient's existing maxillary CD

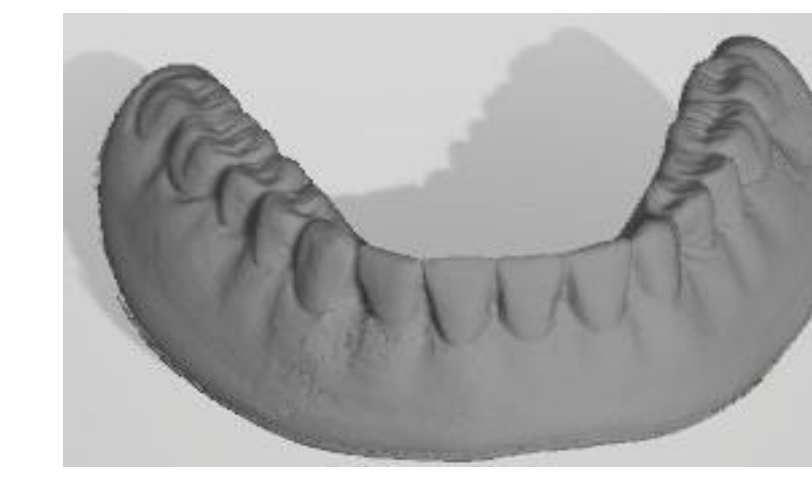


Figure 2b. Scan of patient's existing mandibular CD

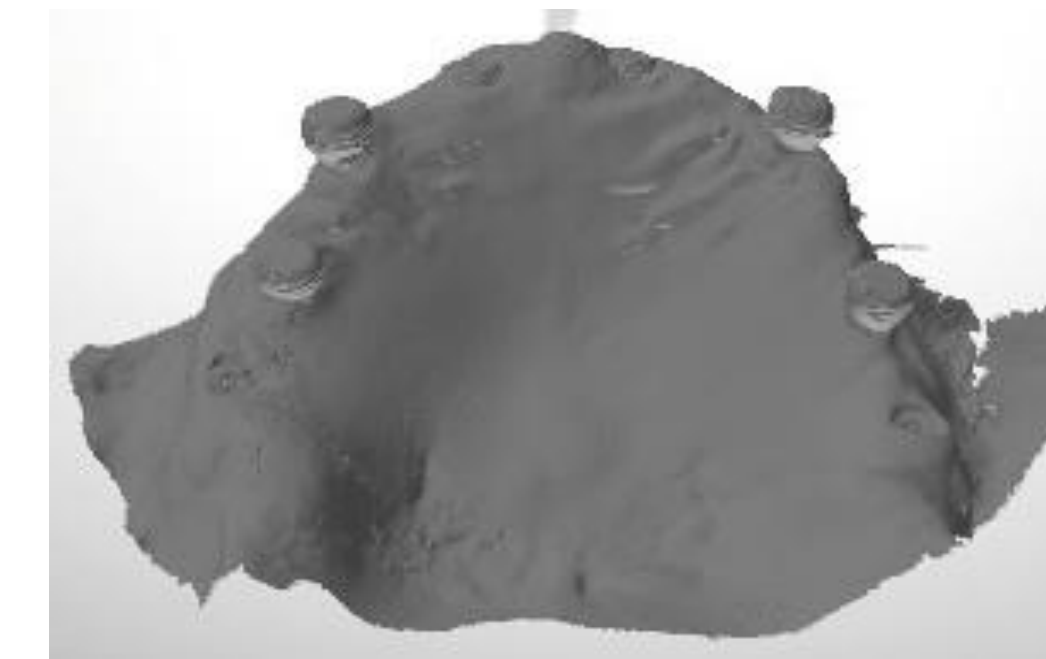


Figure 3a. Intraoral scan of maxillary arch

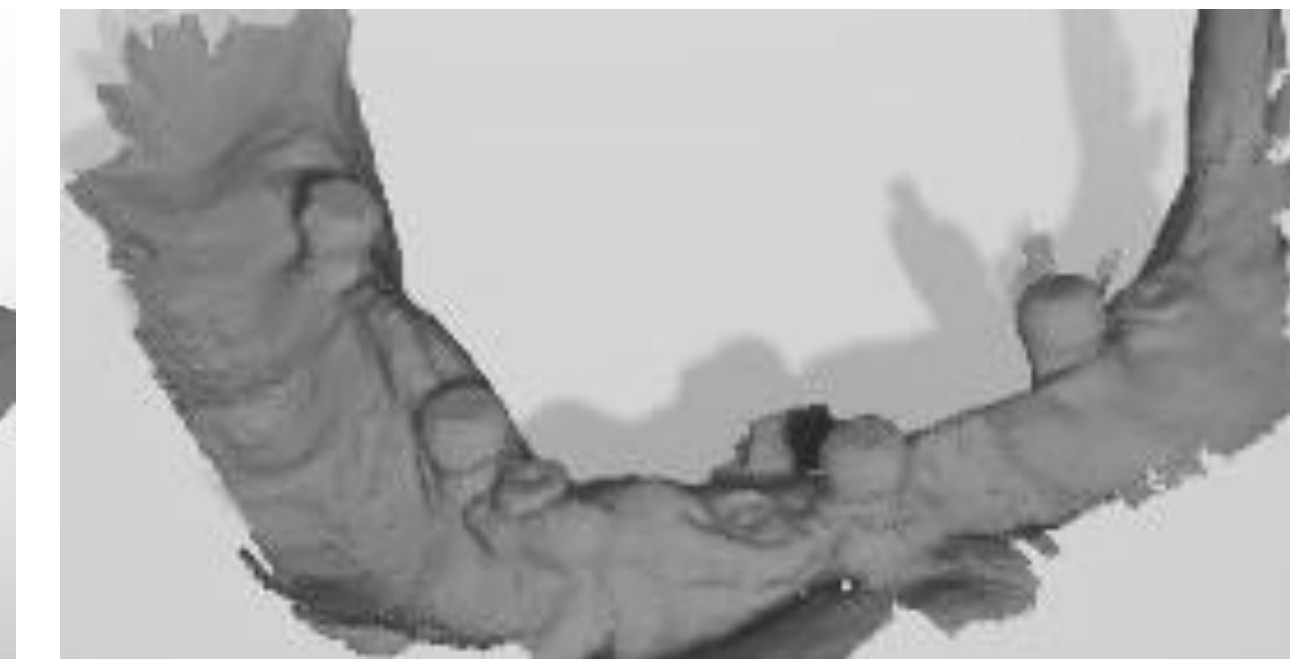


Figure 3b. Intraoral scan of mandibular arch

VISIT 2: Teeth try-in

Using 3D-printed casts and data from the scanned CDs, record bases were produced, and teeth set-up were completed (Fig 4).

1. Denture teeth trial and verification of VDO was done.



Figure 4. Analog teeth set-up on printed articulated models

VISIT 3: Denture Try-in, Intraoral Housing Pick-up and IROD Insertion

The definitive dentures were fabricated with injection molding technique using Ivoclar Vivadent AG, Schaan, Liechtenstein) with the selective laser sintered framework to reinforce the denture base.

1. Dentures were tried in, and the housings were picked-up intraorally (Fig 5a).
2. Maxillary and mandibular IRODs were delivered to the patient (Fig 5b).



Figure 5a. Intaglio surface of mandibular and maxillary OD with framework and housings



Figure 5b. Completed definitive 4 – implant retained overdentures.

RESULTS

This method integrates the strengths of both digital and analog approaches. It effectively tackles the challenges posed by each technique individually, providing the way for a smooth and efficacious procedure for implant-retained overdenture fabrication. Function, retention and stability of the delivered overdentures were deemed to be clinically acceptable.

CONCLUSION

Implant-retained overdentures can be reliably and efficiently produced utilizing a combined digital-analog method.

Metal housings have shiny surface and may not be the ideal surface for intraoral scanning but performed adequately as scan bodies. Especially, when the metal housings are being picked up intraorally, the ideal surface may not be a critical factor for producing accurately fitting implant retained overdentures.

CLINICAL SIGNIFICANCE

This digital-analog workflow omits the use of conventional impression materials and time-consuming analog procedures. The workflow resulted in time-efficient communication between dental practitioners and lab technicians, thereby minimizing errors and allowing fewer dental appointments and better patient satisfaction.

REFERENCES

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