



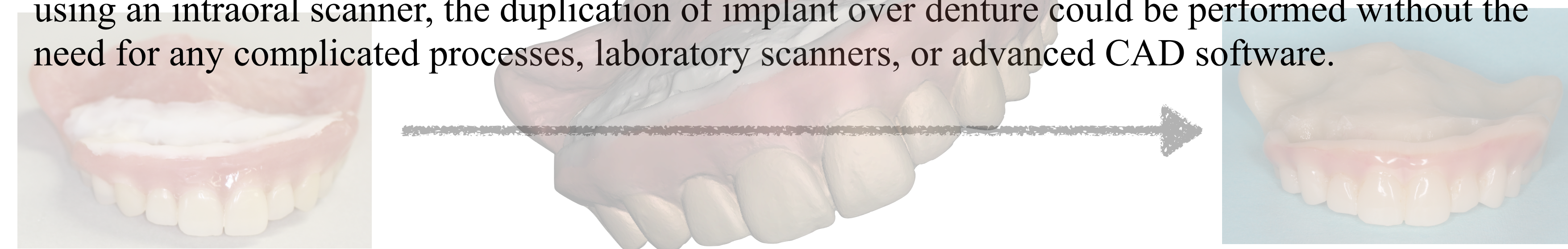
Denture duplication technique using intra oralscanning and 3D printing: copy of implant over denture

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Purpose

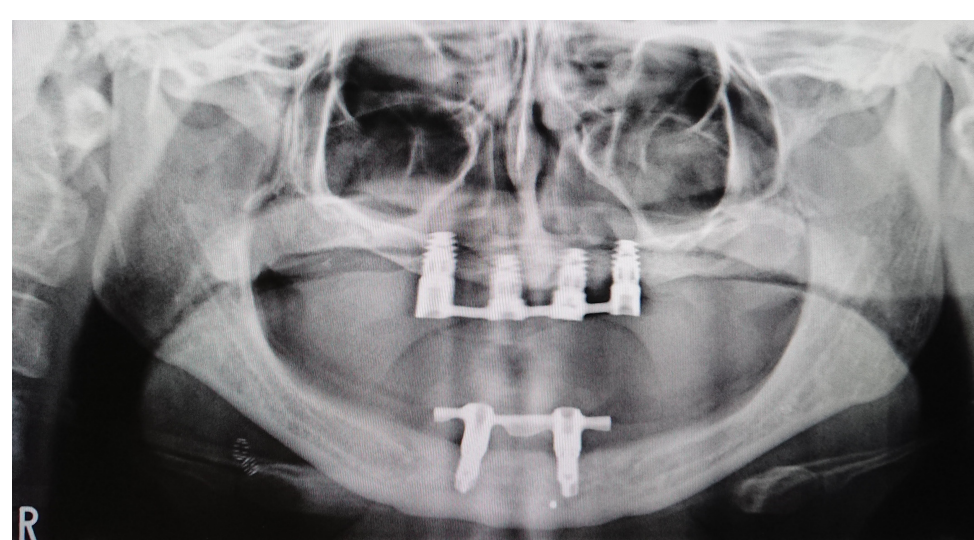
The duplication of complete dentures is applied in various ways as custom trays, occlusion rims, or treatment/temporary dentures. Recently, the denture fabrication is used a digital technique which intra/extra scanning of edentulous ridge and then milling or 3D printing of prostheses. In this report, using an intraoral scanner, the duplication of implant over denture could be performed without the need for any complicated processes, laboratory scanners, or advanced CAD software.



Materials and methods

Patient history.

This patient was treated with maxillary and mandible implant-supported removable prostheses after bone and mucosal graft surgery before 2 years. However, peri-implant mucositis was occurred due to poor oral hygiene in maxilla mucosa that complex shaped under the bar attachment. In June 2020, a second mucosal graft was performed in maxilla mucosa.



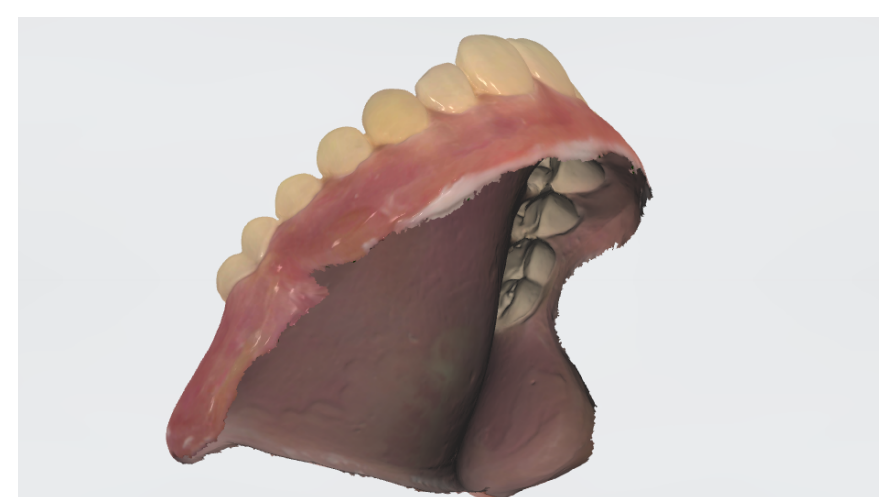
Panoramic radiography



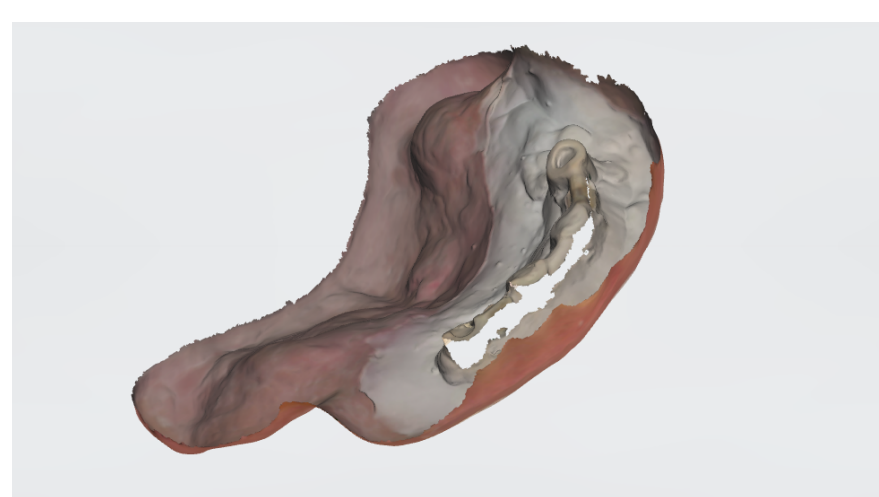
Original denture

Scan of the over denture.

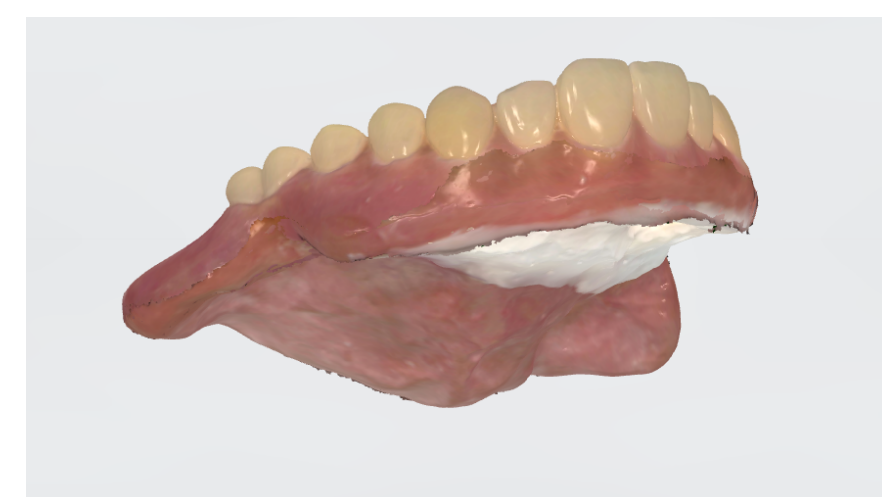
The original denture duplicated to use as treatment denture after surgery. In this duplication technique, after scanning the cameo and intaglio surfaces of the implant over denture using an intraoral scanner (TRIOS3, 3Shape). The two images were superimposed on the interocclusal image.



Cameo surface



Intaglio surface



Interocclusal record

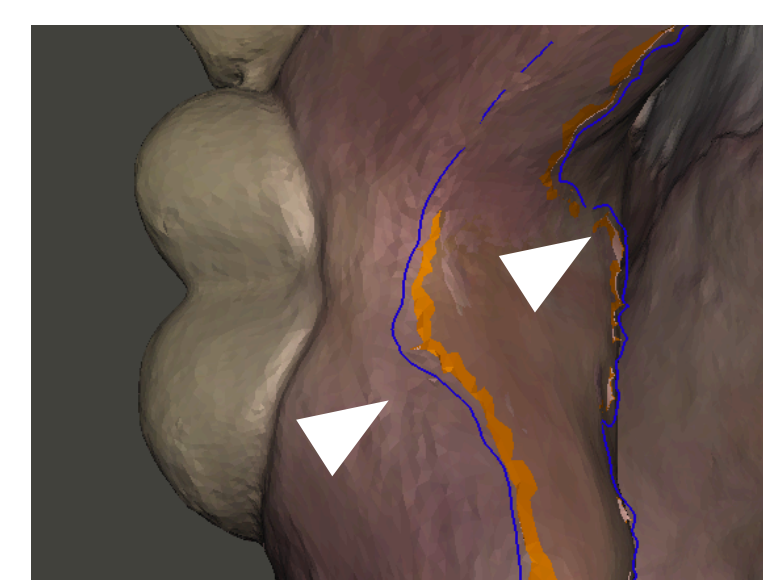
CAD design of the duplicate denture.

The STL file of the cameo and intaglio surfaces was imported into free downloadable CAD software (Meshmixer, Autodesk).

The overlapping margins of the cameo and intaglio surfaces were selected.



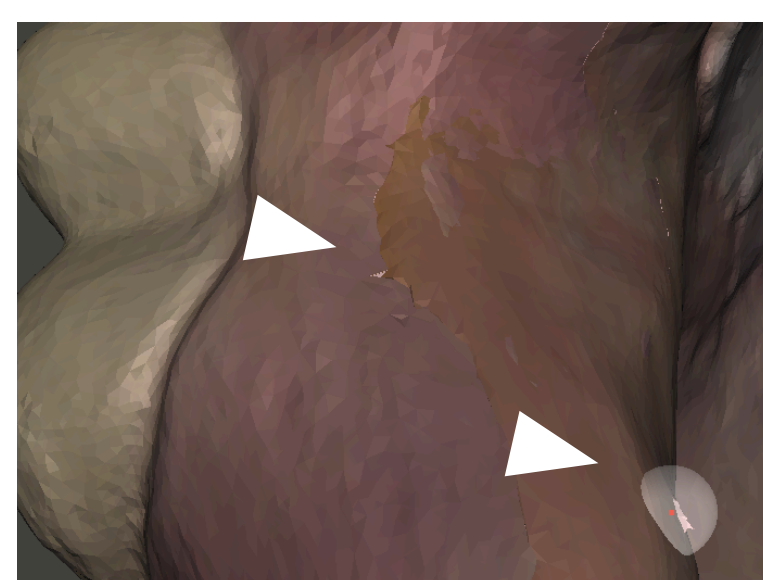
The STL border was smoothed using the “smoothing boundary” command.



The STL border was combined using the “join” command. The gap between the cameo and intaglio surfaces was filled.



As the overlapping area of the connected STL surfaces displayed sharp edges, smoothing was performed using the “Sculpt” command.



The superimposed image was subsequently used as data for fabricating the duplicate complete denture with a 3D printer (Cares® P-30, Straumann AG).

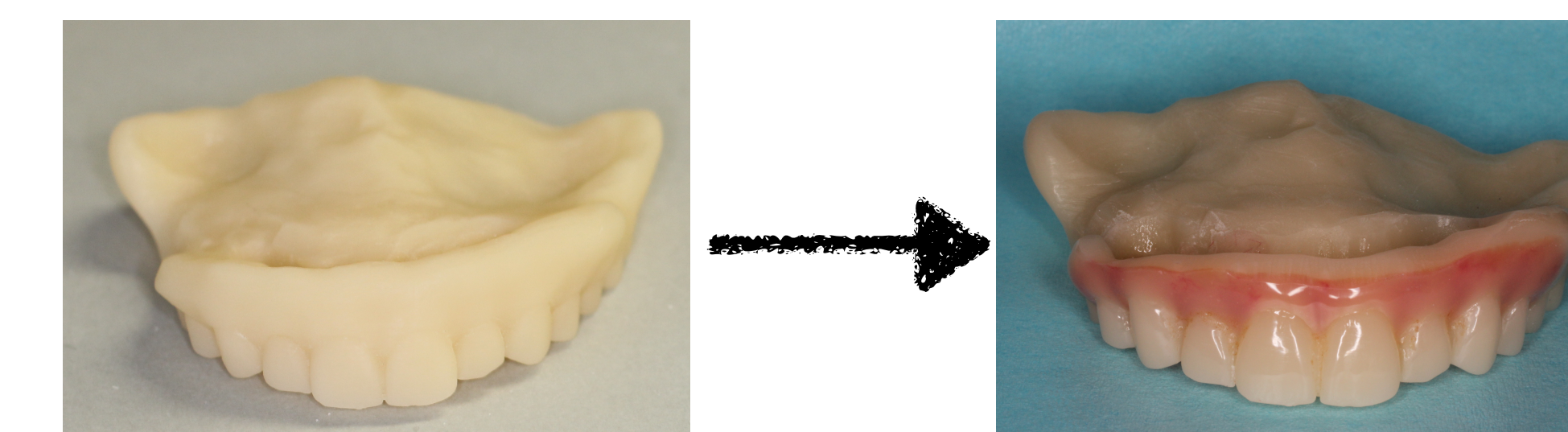


STL data

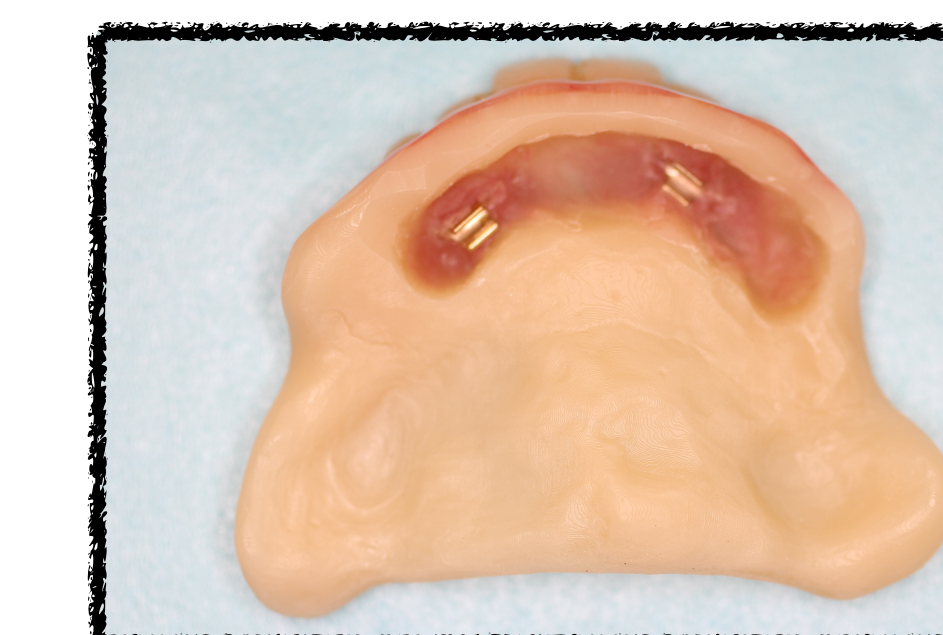


Results

The denture was slightly adjusted in occlusal and intaglio surfaces and replaced a self-cured resin and gingiva-shade composite resin from photo-cured resin in intaglio surface that female parts of the bar attachment was attached.



Duplicate denture



Intaglio surface



Front view

Conclusion

This technique enables to simplify duplication of dentures in a shorter time compared to the conventional method, and may potentially become a new method for denture duplication.

Reference

Oyamada Y, Yonezawa Y, Kondo H. Simple Duplication Technique of Complete Denture Using an Intraoral Scanner. J Prosthodont. 2021.

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