



Fabrication of maxillary complete denture and mandibular implant-retained overdenture using digital workflow : A case report

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Introduction

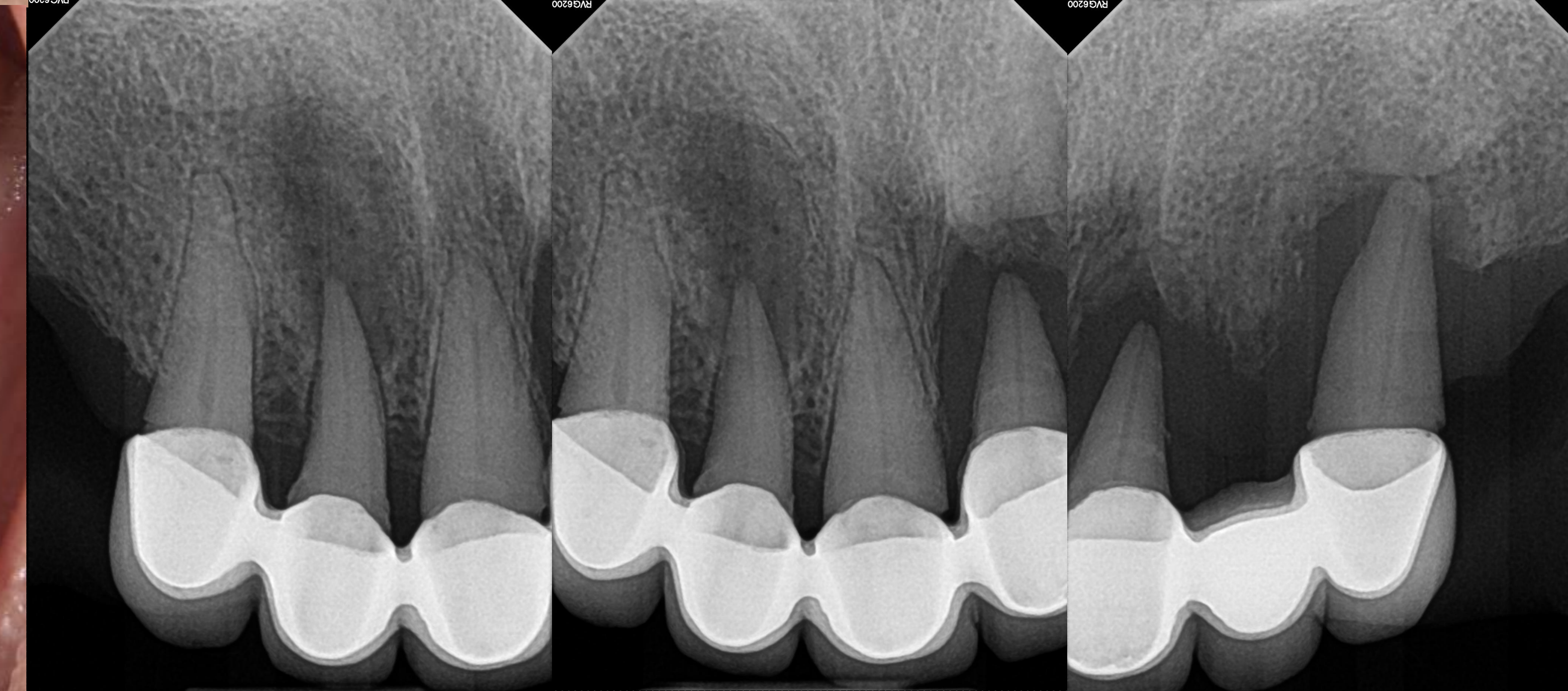
Patients with implant overdentures have an increased biting force compared with patients who wear complete dentures. In this case, two implants were placed to fabricate mandibular implant-retained overdenture with Locator® attachment to improve the retention of the denture. Fabrication of mandibular implant-retained overdenture using digital workflow is convenient because it can shorten the laboratory process and reduce the number of patient visits.

Case Presentation

Patient	74 years old / Female
C.C	Upper teeth are mobile and I want to make a new denture.
PMH	Admission for long term care at local hospital
PDH	Maxillary 6-unit Bridge & Mandibular complete denture fabrication at local dental clinic in 2007

Problem list

Severe mobility on remaining maxillary anterior teeth
Generalized severe alveolar bone resorption



Treatment plan

Fabrication of maxillary complete denture and mandibular implant retained overdenture

- Extraction of remaining maxillary anterior teeth
- Implant installation with surgical stent made by modifying the radiographic stent.



Treatment progress

• Clinical workflow •

1st visit Preliminary impression, Digital facebow transfer, Facial scan (Using UTS-CAD, Centric tray)

2nd visit Final impression (using closed mouth technique) Vertical dimension & centric relation taking with gothic-arch tracing, Facial scan

3rd visit Temporary denture delivery

4th visit Definitive denture delivery

• laboratory workflow •

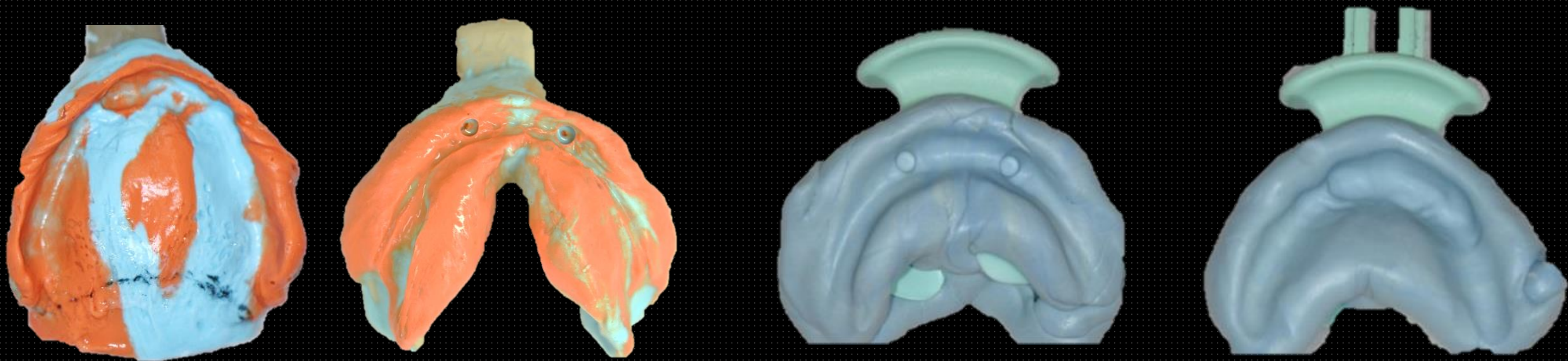
• Individual tray fabrication using 3D printing

• Superimposing impressions scans and facial scans
• Temporary denture fabrication using 3D printing

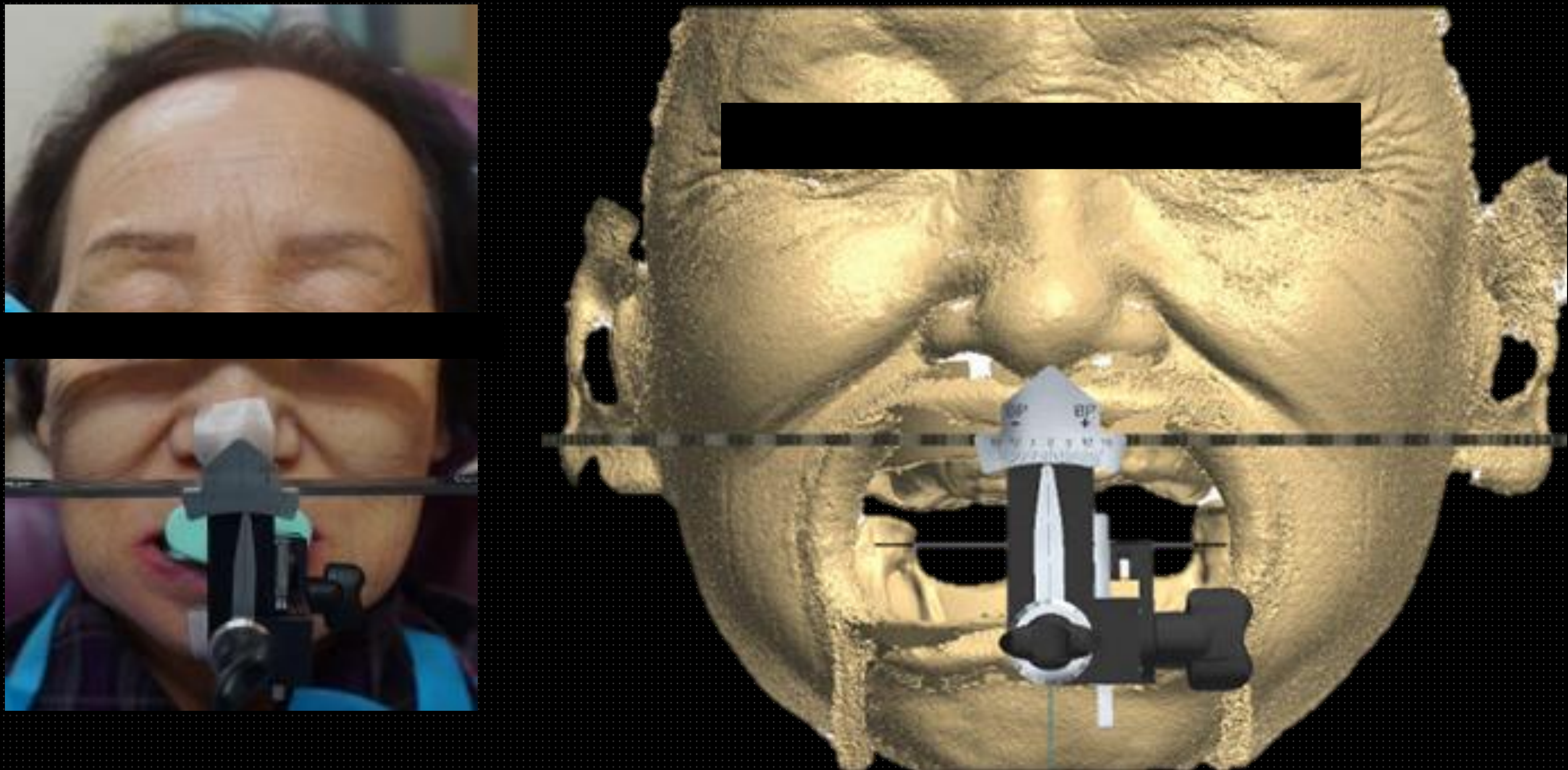
• Definitive denture fabrication using milling monoblock

1st visit: Preliminary impression, Digital facebow transfer, Facial scan

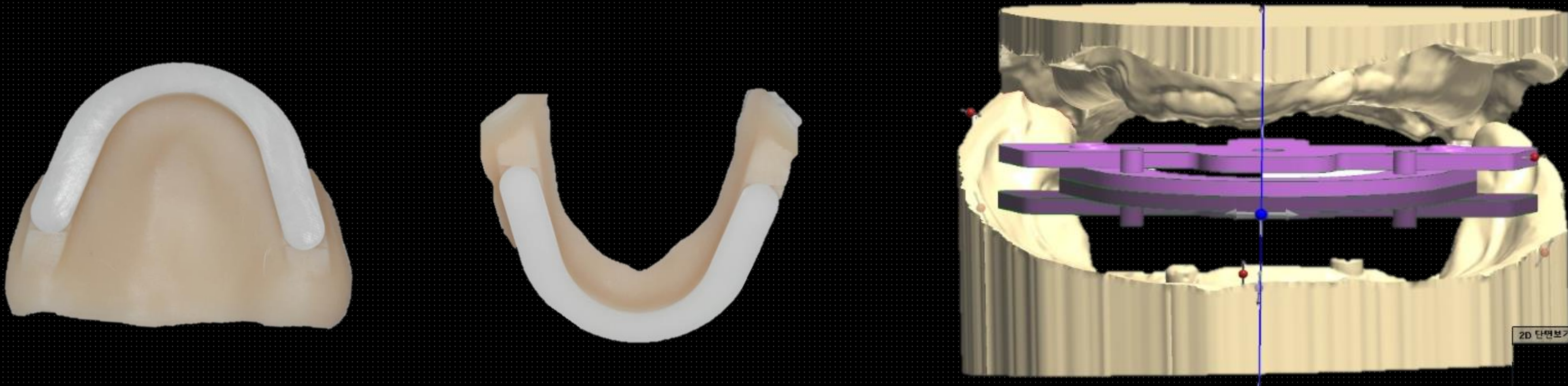
1) Preliminary impression (AccuDent XD, Ivoclar Vivadent, Schaan, Liechtenstein, Germany) (Centric tray, Ivoclar Vivadent, Liechtenstein, Germany)



2) Vertical dimension taking & Digital facebow transfer (UTS CAD, Ivoclar Vivadent, Liechtenstein, Germany) (BP:-1.0,CE:+2.0)

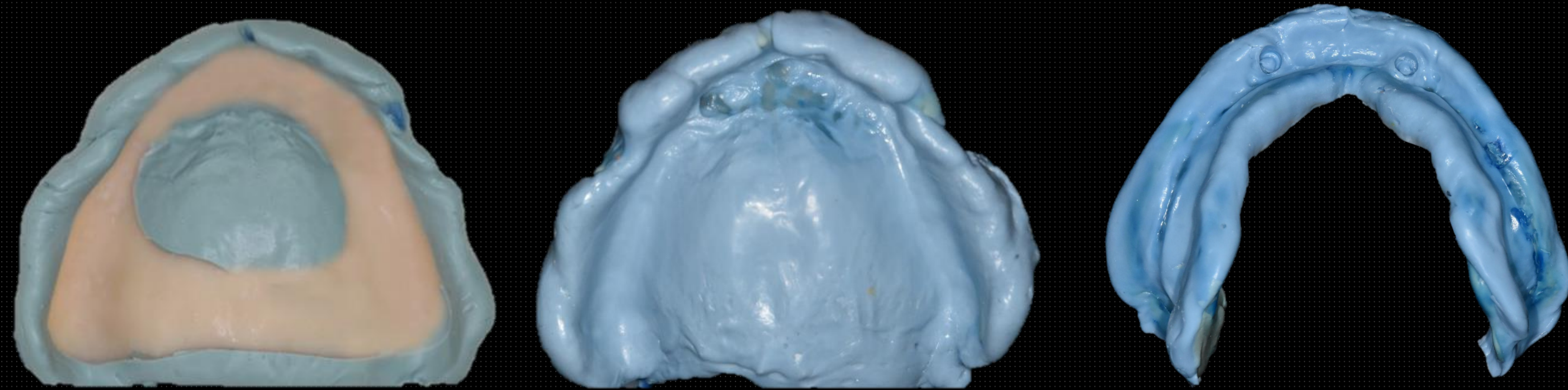


* laboratory workflow
Fabrication of individual tray where Gnathometer CAD can be attached (Asiga max, Sydney, Australia / Mazic ® D Temp, Gangwon-do, Korea) (3 Shape Dental system, 3 Shape A/S, Copenhagen, Denmark)

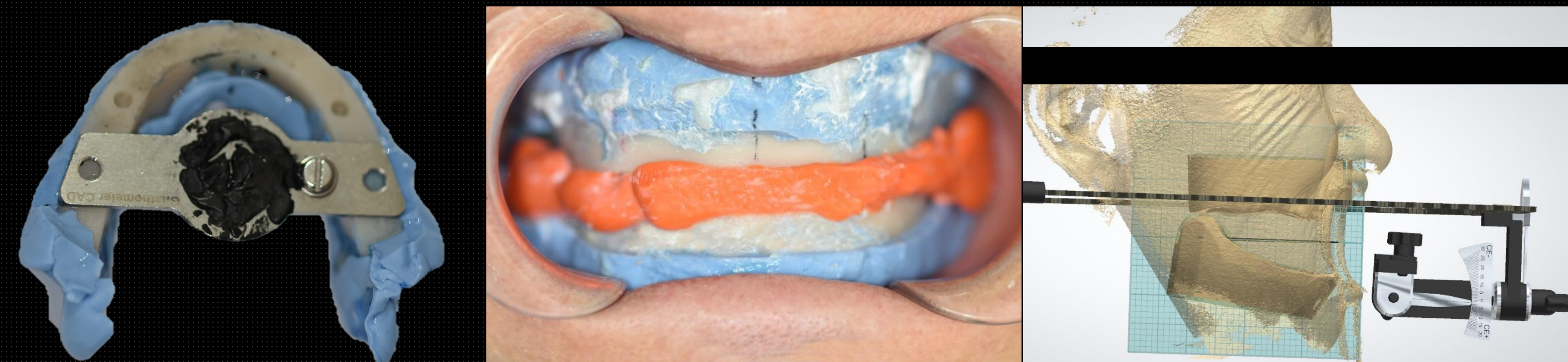


2nd visit: Final impression (using closed mouth technique)
 Vertical dimension & centric relation taking with gothic-arch tracing, Facial scan

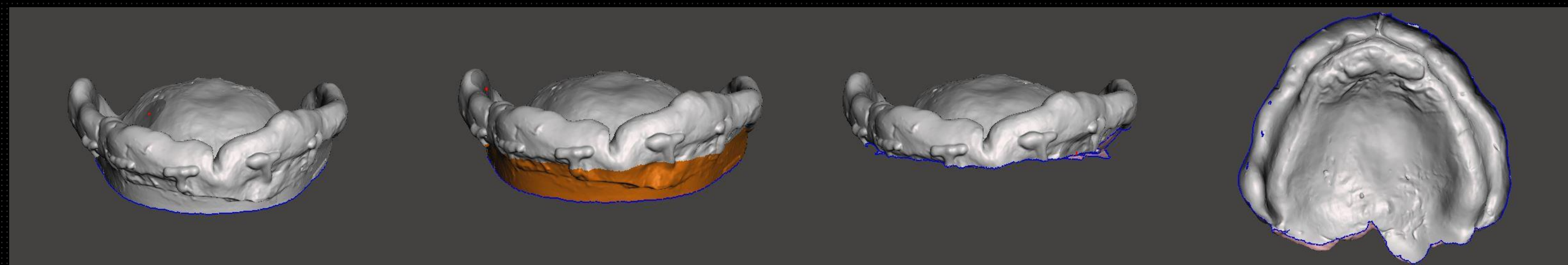
- 1) Border-molding (Exa-hiflex, Tokyo, Japan)
 Final impression (Exadenture, Tokyo, Japan)



- 2) Vertical dimension & centric relation taking with gothic-arch tracing, Facial scan
 (Gnathometer M CAD, Ivoclar Vivadent, Liechtenstein, Germany)
 (UTS CAD, Ivoclar Vivadent, Liechtenstein, Germany) (BP:-1.0,CE:+2.0)
 (Thunk 3D Archer, Beijing, China)

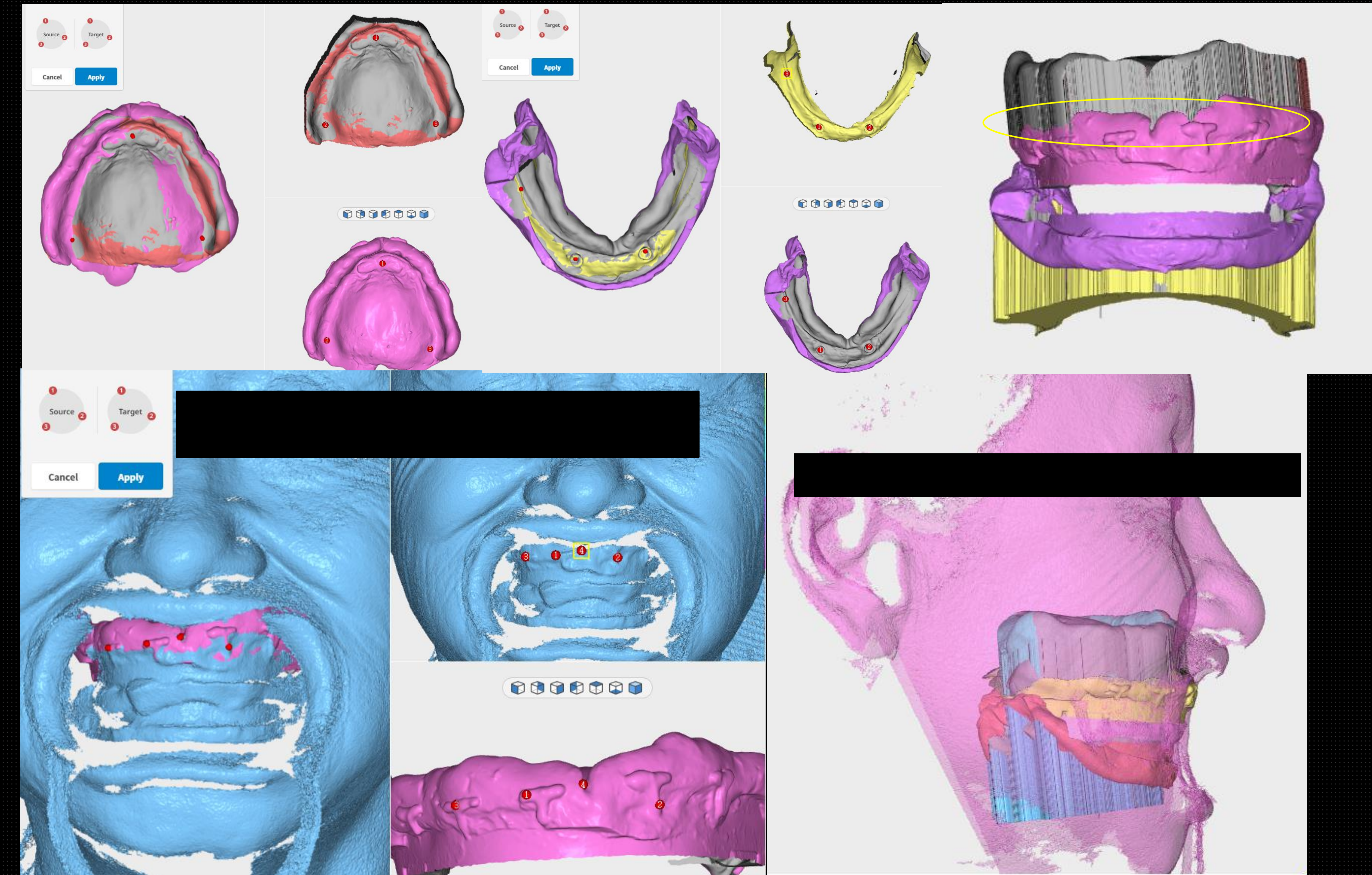


Model scan & Mesh mixer flip

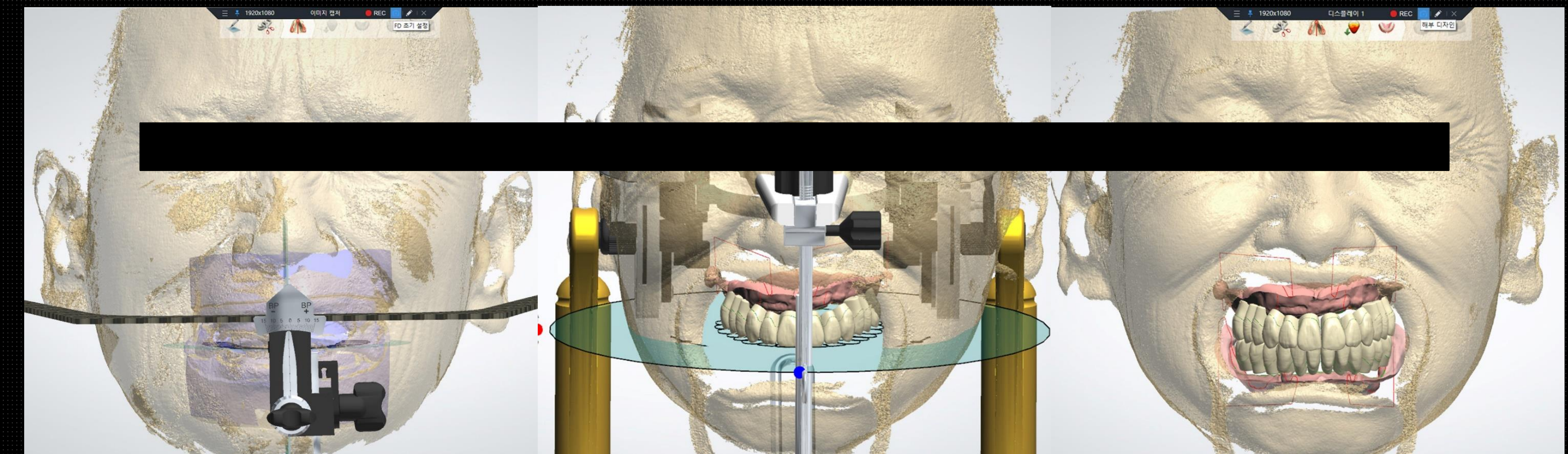


* laboratory workflow

- Superimposing impressions scans and facial scans
 (3Dme studio, Imagoworks Inc., Seoul, Korea)



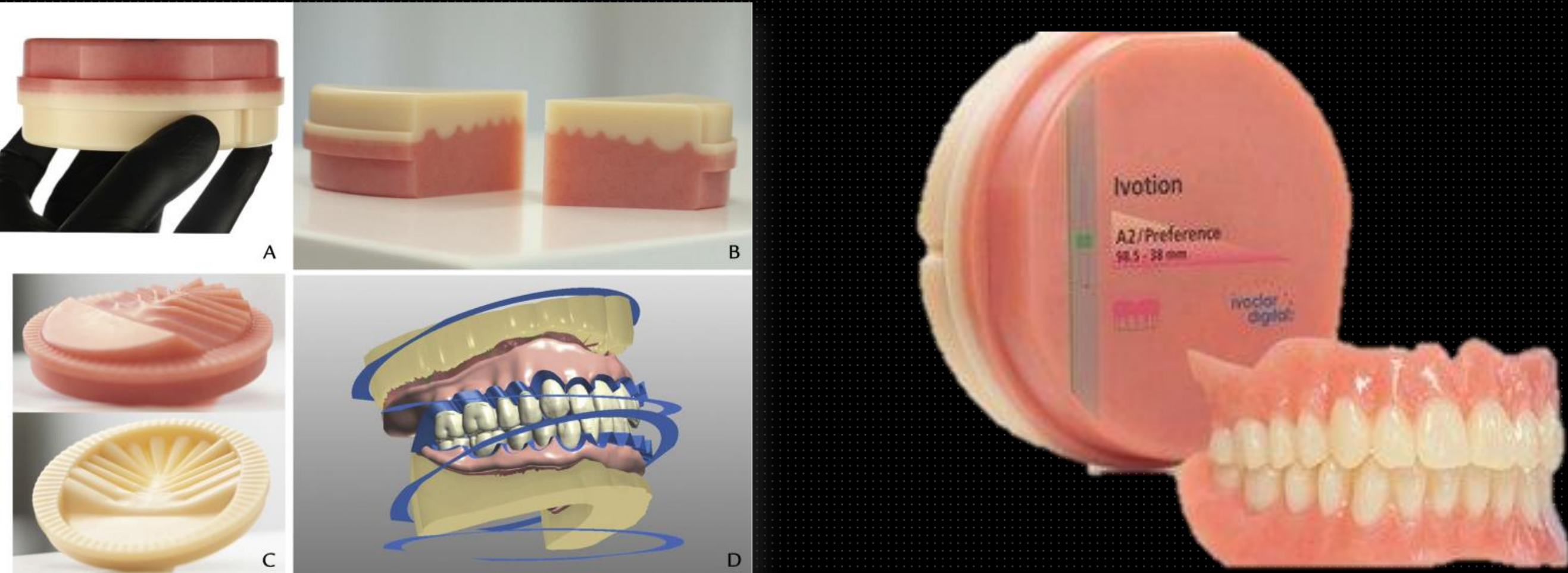
- Temporary denture fabrication using 3D printing
 (Asiga max, Sydney, Australia / Mazic ® D Temp, Gangwon-do, Korea)
 (3 Shape Dental system, 3 Shape A/S, Copenhagen, Denmark)



3rd visit: Temporary denture delivery

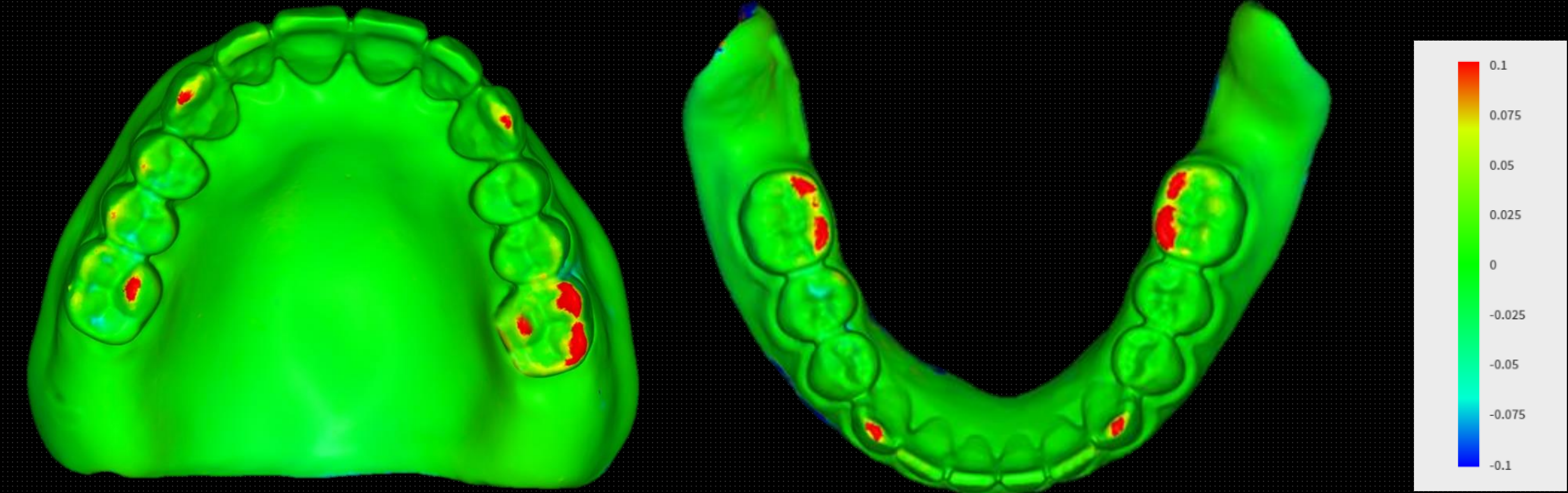


* laboratory workflow
Definitive denture fabrication using milling monoblock
Milling dentures using the scanned data of the occlusion adjusted temporary denture.
(Ivotion block, Ivoclar Vivadent, Liechtenstein, Germany)

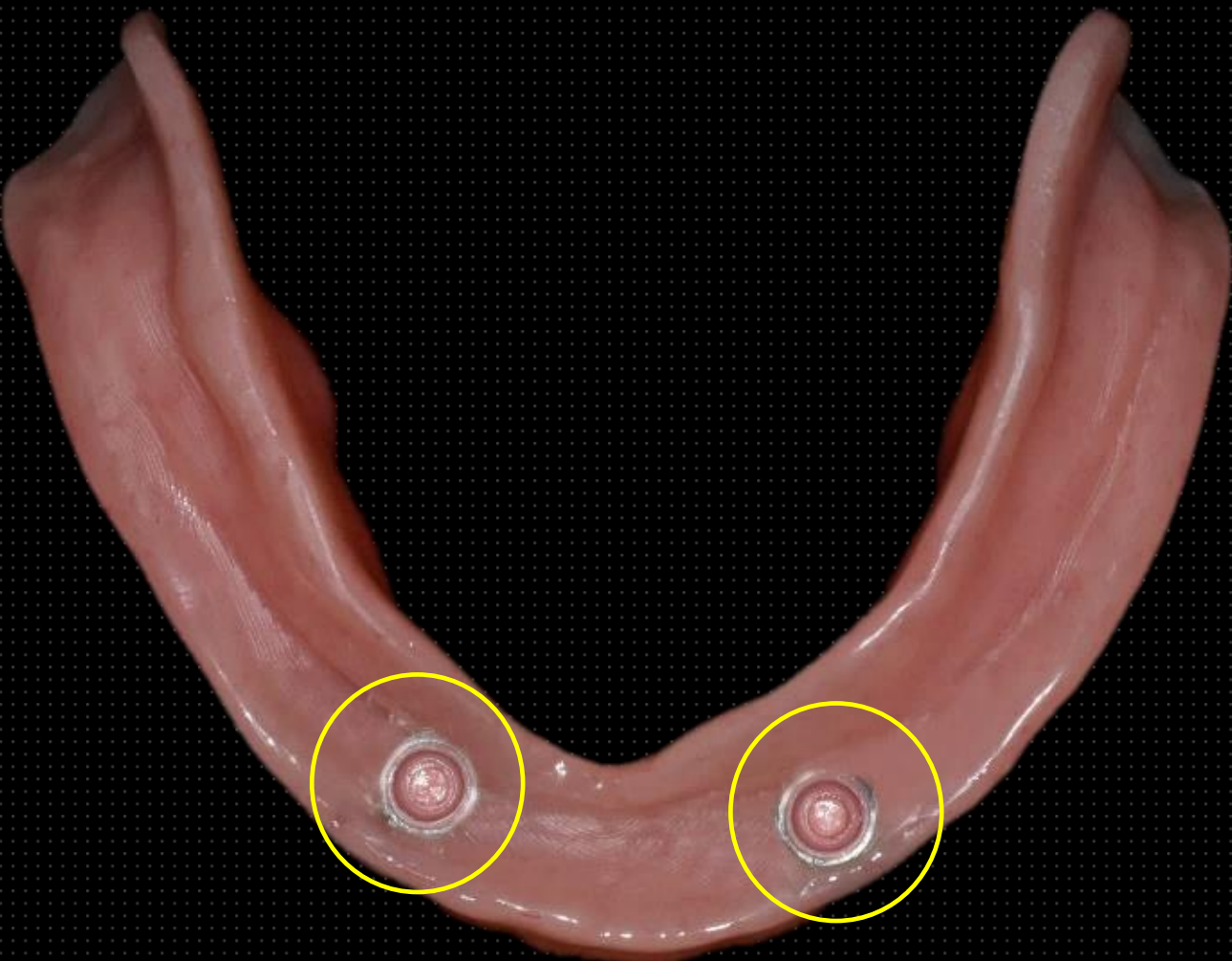


4th visit: Definitive denture delivery

Superimposing milling denture and milling denture with occlusal adjustment
(3Dme studio, Imagoworks Inc., Seoul, Korea)



Placement of overdenture attachments
(After 2 weeks of settling down period)





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➤ Before & After treatment



Result

The patient's chief complaints about retention loss of mandibular denture were greatly improved by fabricating mandibular implant-retained overdenture.

Because the treatment time and the number of visits were shortened, the patient was very satisfied.

Locator® attachment on mandibular implant-retained overdenture was used for insufficient intermaxillary distance.

During the follow-up period, denture discomfort and radiographic bone resorption around the implant were not observed.

Conclusion

In this case, fabrication of mandibular implant-retained overdenture demonstrated favorable denture retention, stability, and support during masticatory performance and the patient is satisfied with improved functions and esthetic of dentures.

For the long-term success of prosthetics, it is necessary to maintain oral hygiene and periodically recall check to distribute stress between implants.

Definitive denture



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