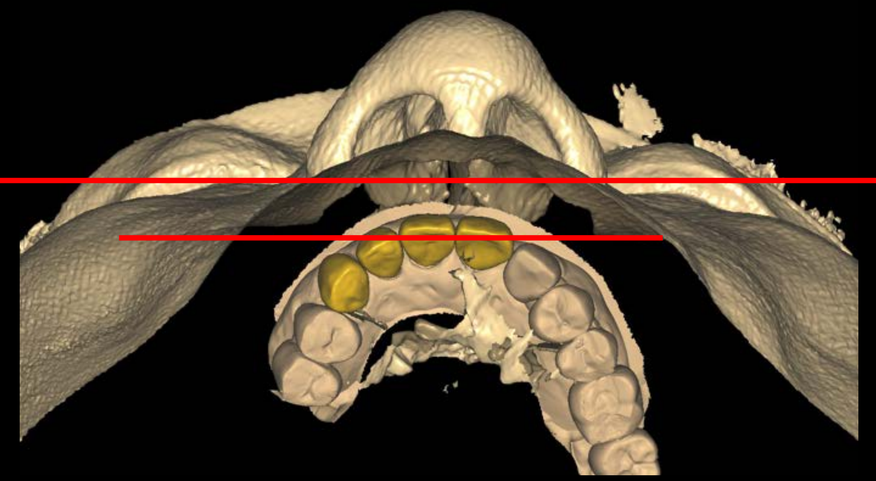
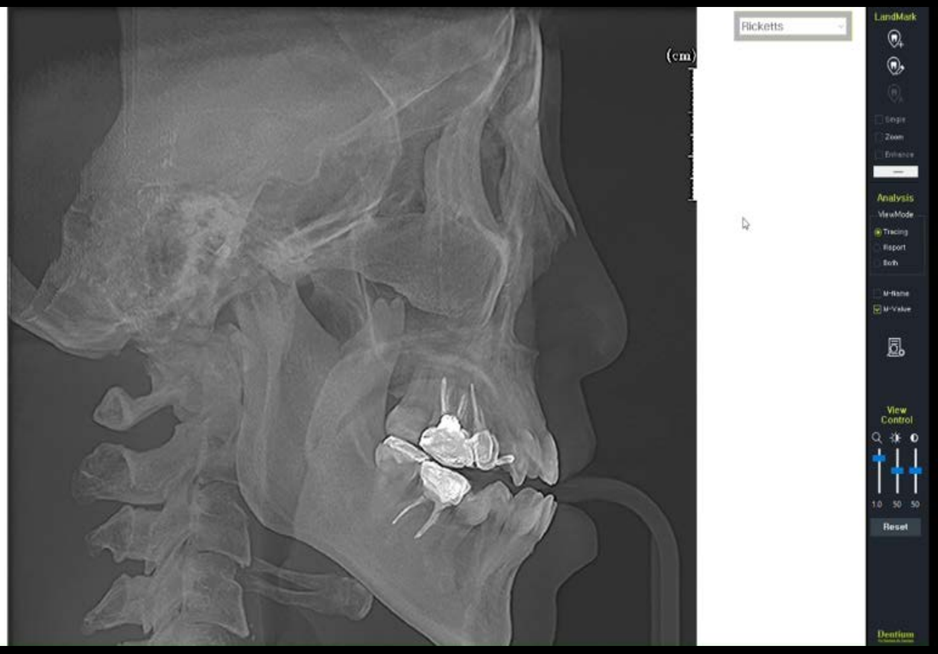
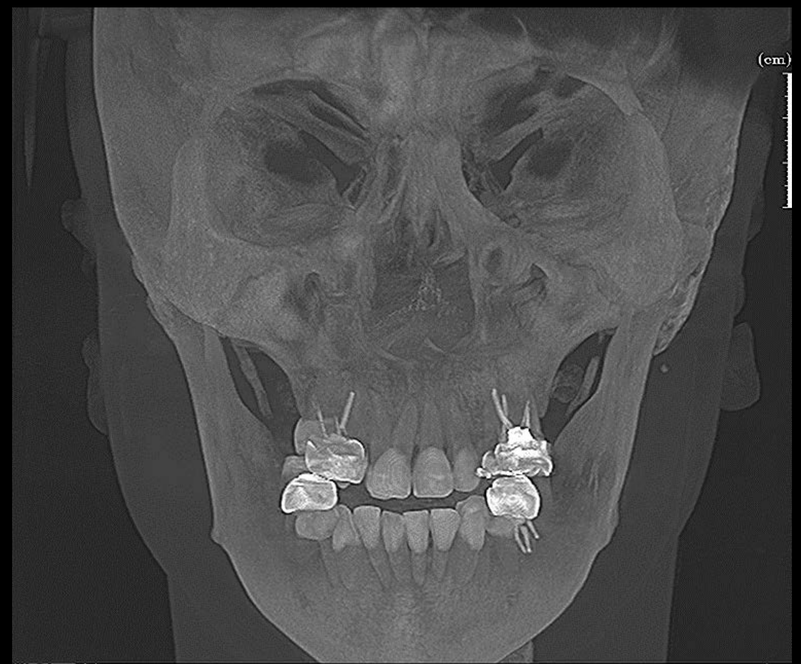


Digital Minimalism

Dr SM Chung

Dentium and Genoss





Digital minimalism

Practical- easy and simple
Daily routine approach with accuracy
Minmal investment of minimal equipment
Good cooperation with dental lab

Why digital in somatology?

Accurate
Convenient

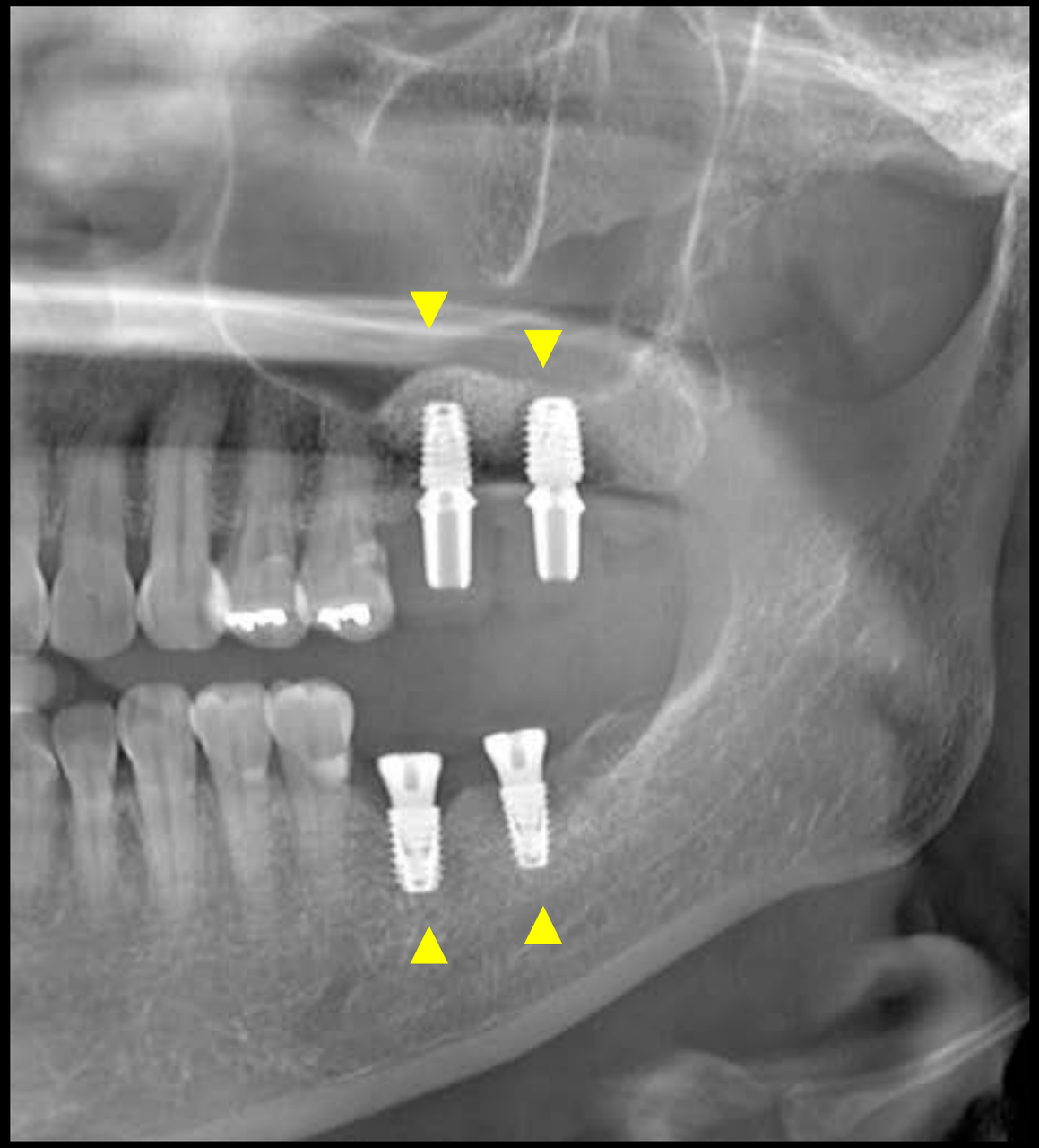
How to apply digital concepts?

BTS (bite tray impression scanning)
CT based occlusal plane
CT check bite
Zr and material development for digital

Contents

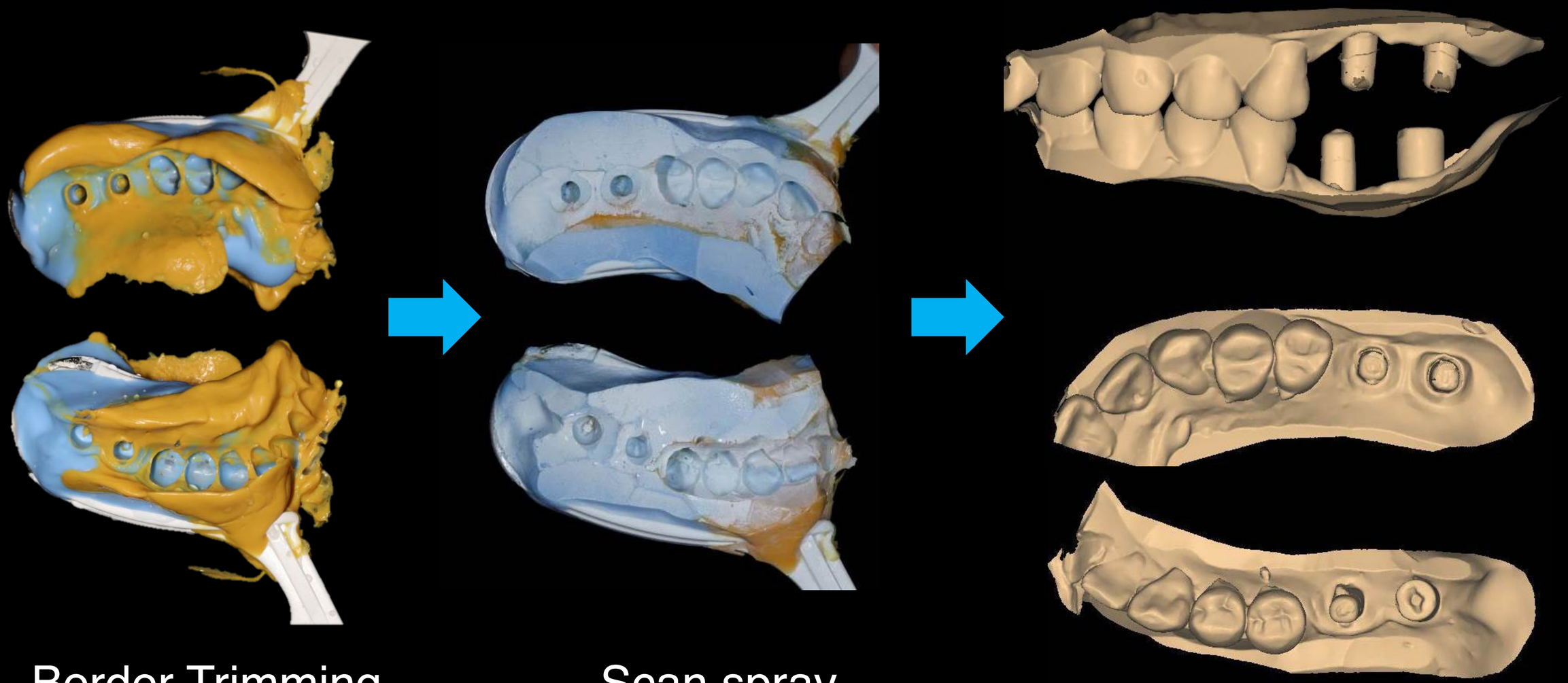
BTS
Diverse applications of CT viewers
Zirconia block
Auxiliary

Bite Tray impression Scan



- # 26i, 27i, 36i, 37i
- bright Bone Level
- bright 3 layer A3.5
- Stain & Glazing

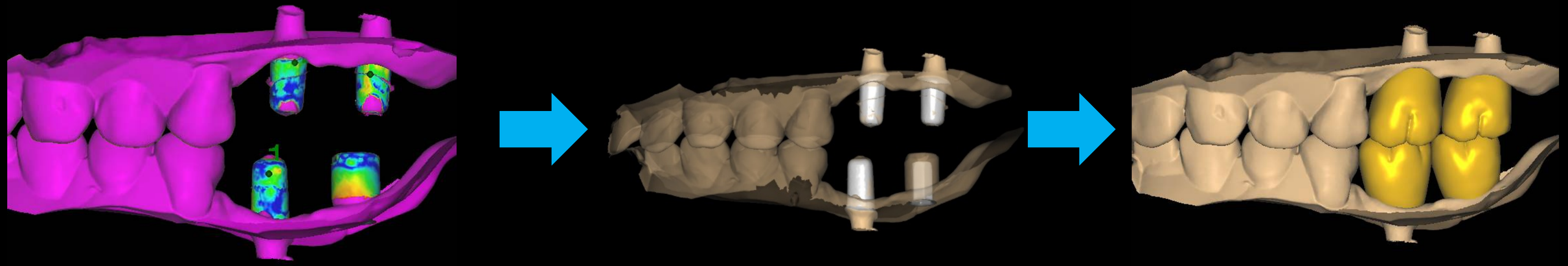
Bite Tray impression Scan



Border Trimming

Scan spray

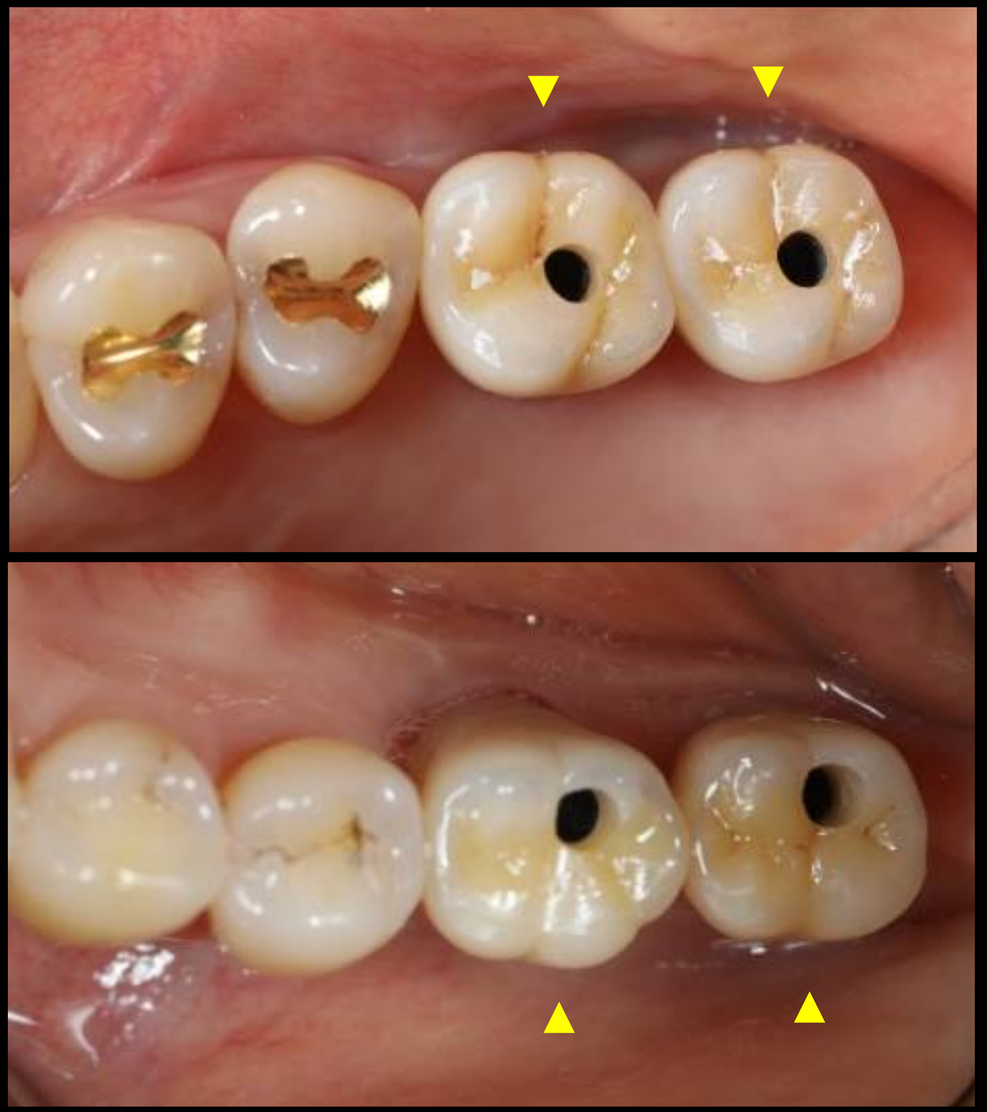
Working Model



1) Abutment library stitching

2) Crown design

Final Prosthesis

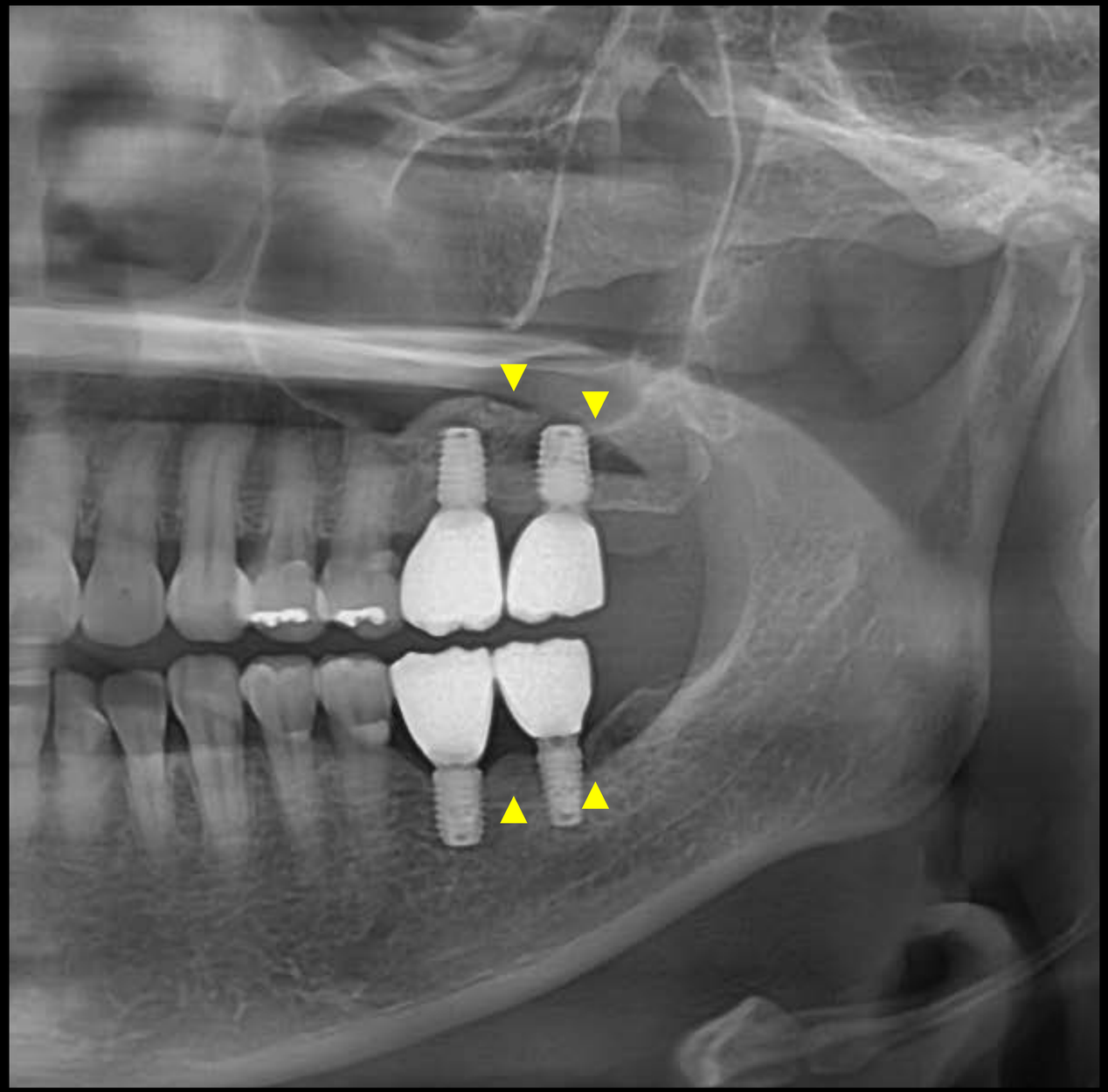


bright 3 layer A3.5

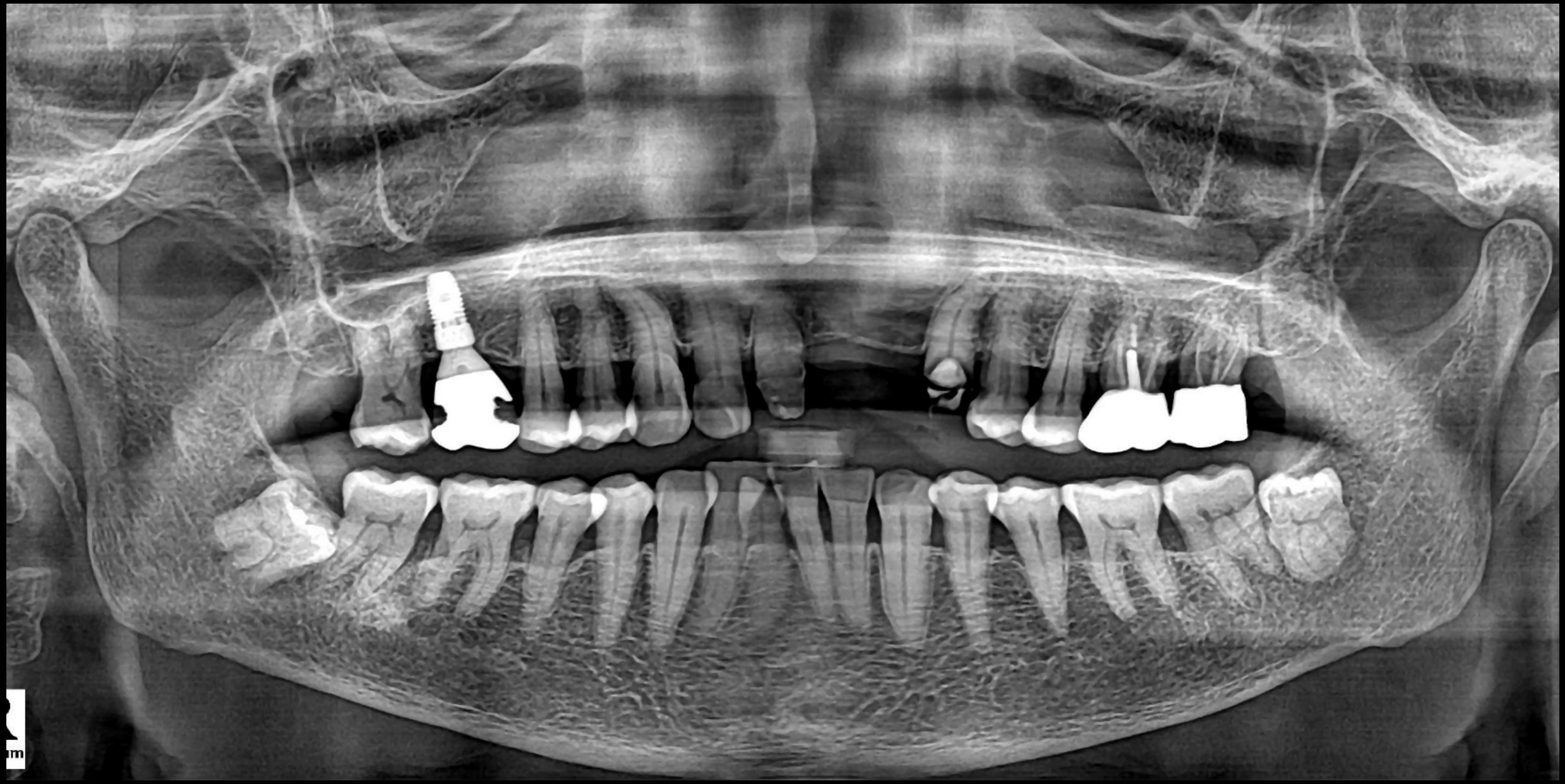
Stain & Glazing

Very precise without occlusal adjustment

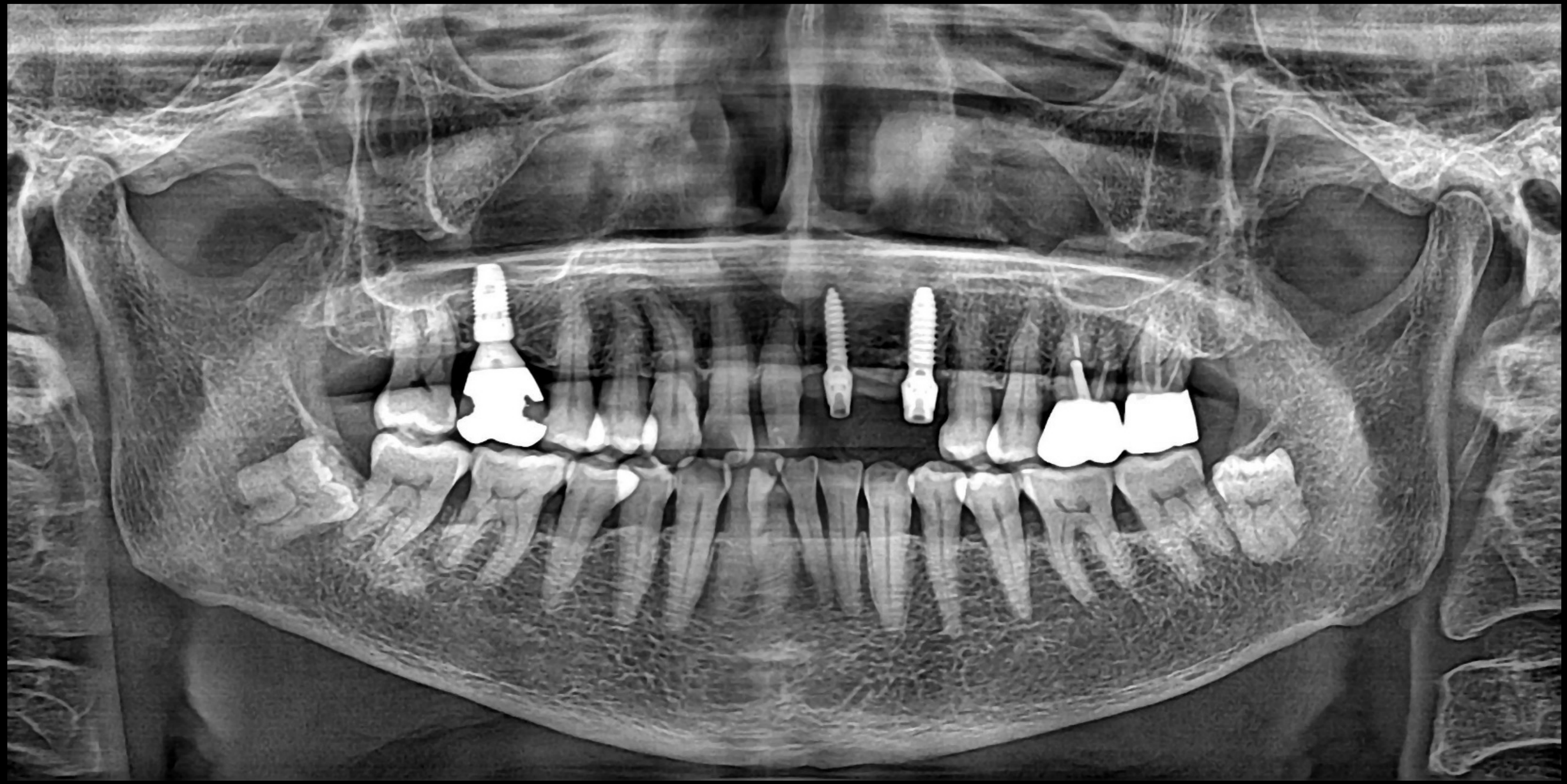
Final Prosthesis



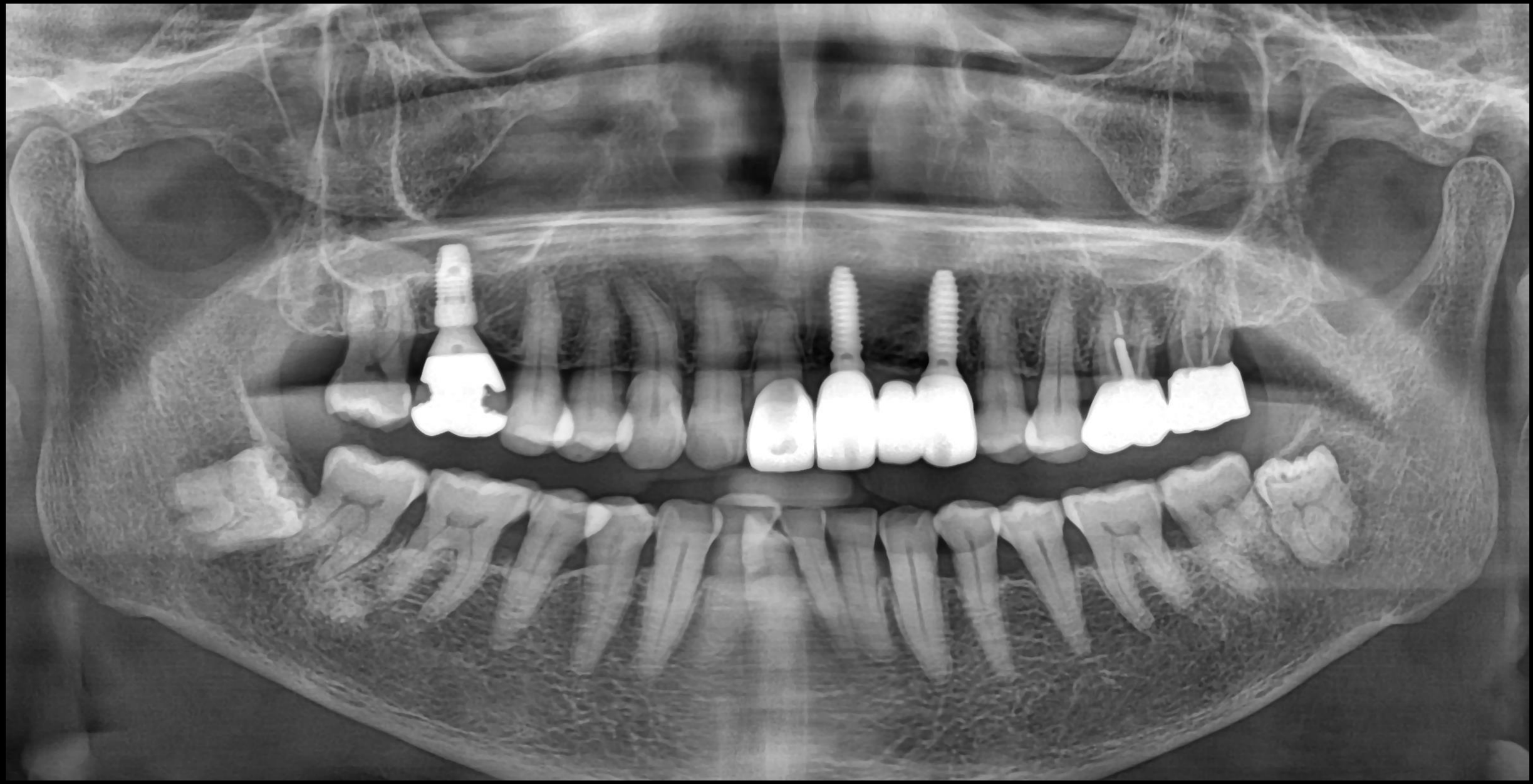
Pre-op (2023-09-06)



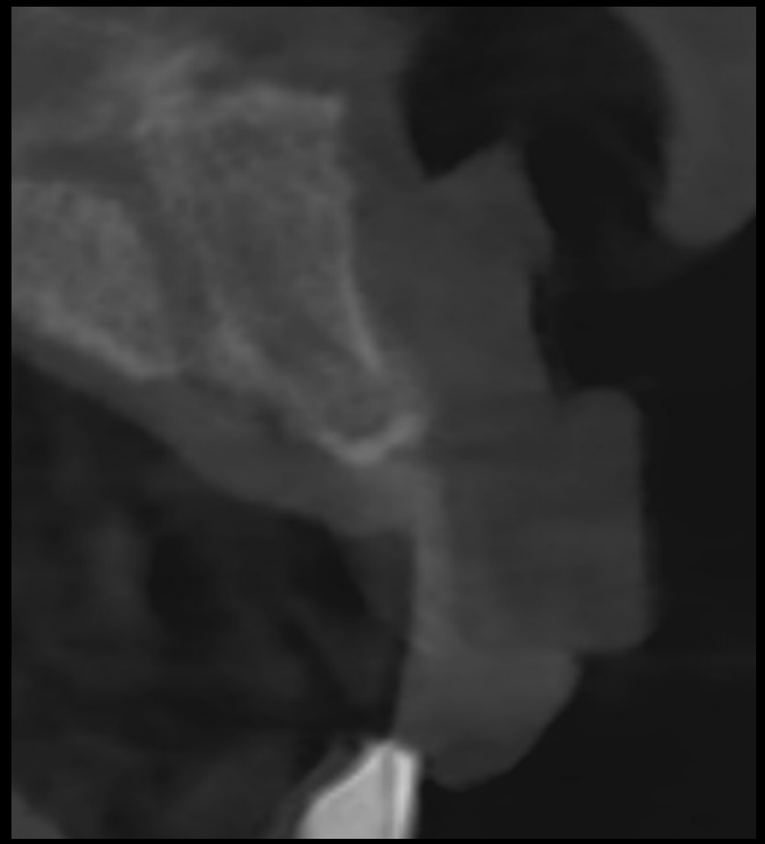
Post-op (2023-09-06)



Final prosthesis (2023-11-02)



Pre-op CT (2023-09-06)



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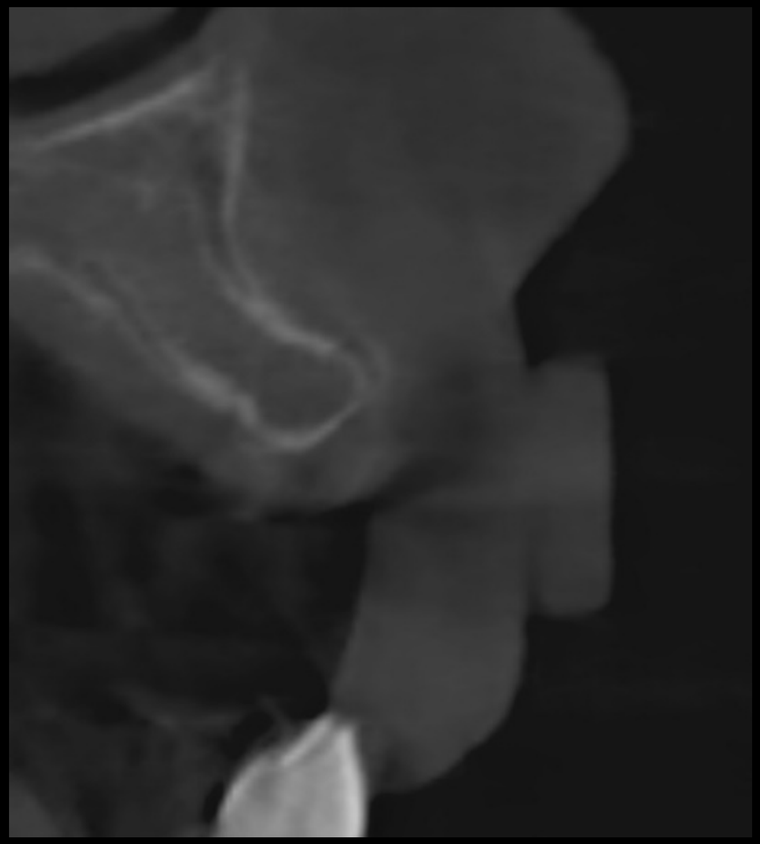

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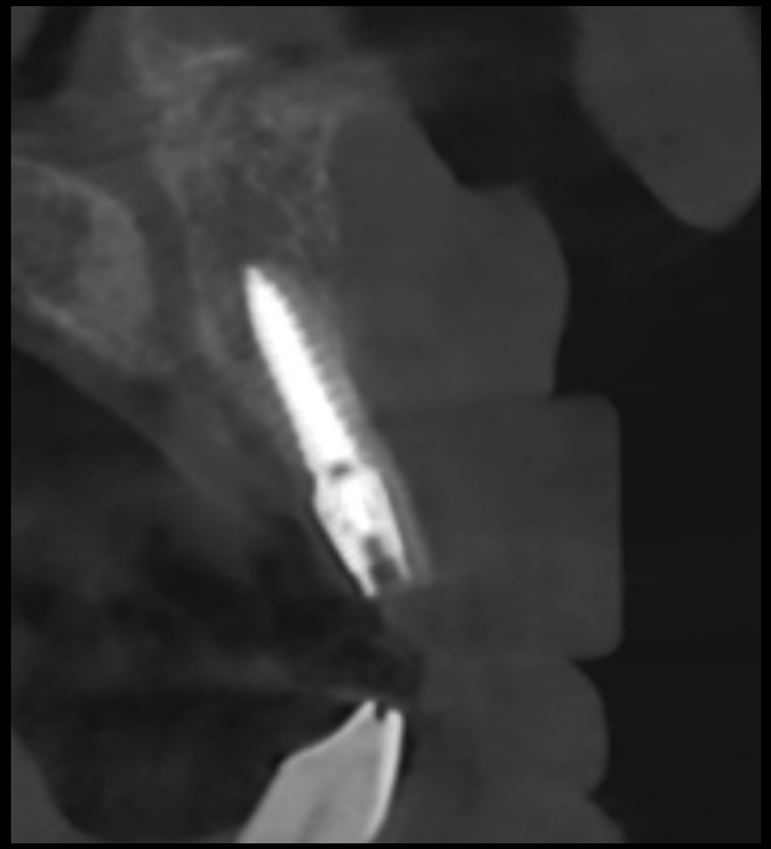
Pre-op CT (2023-09-06)

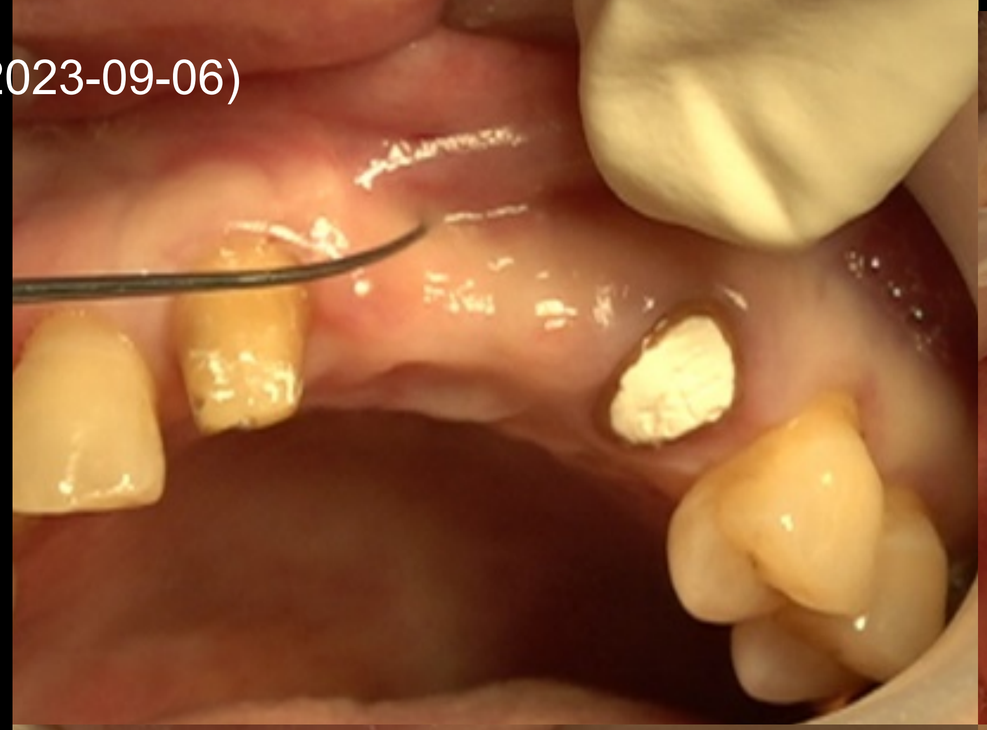


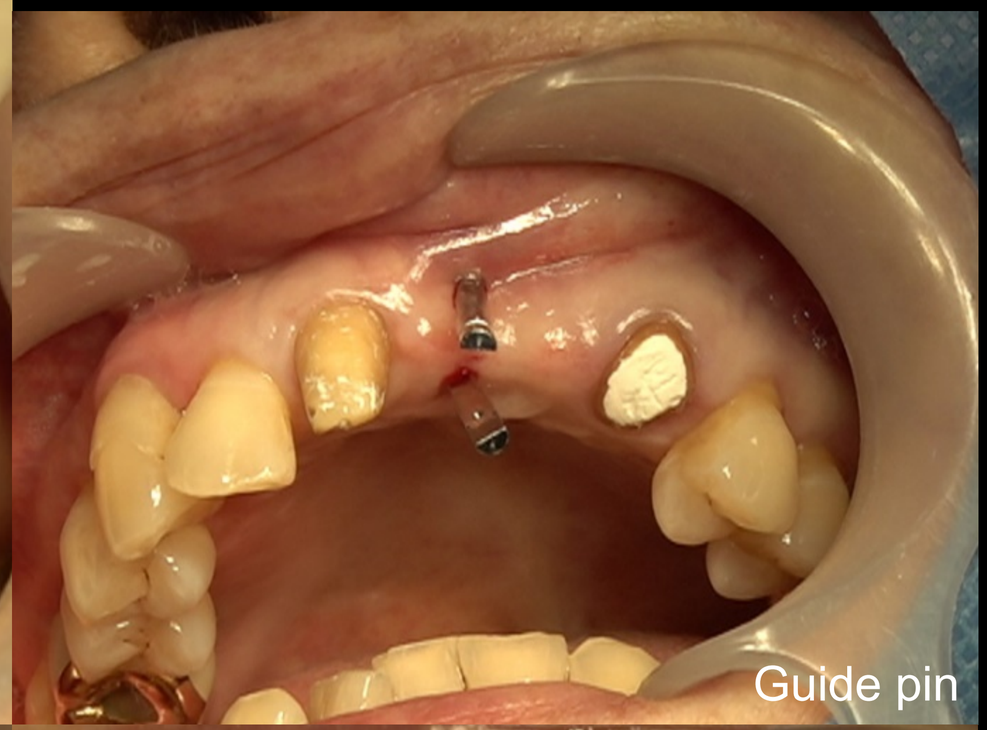
#21

#22

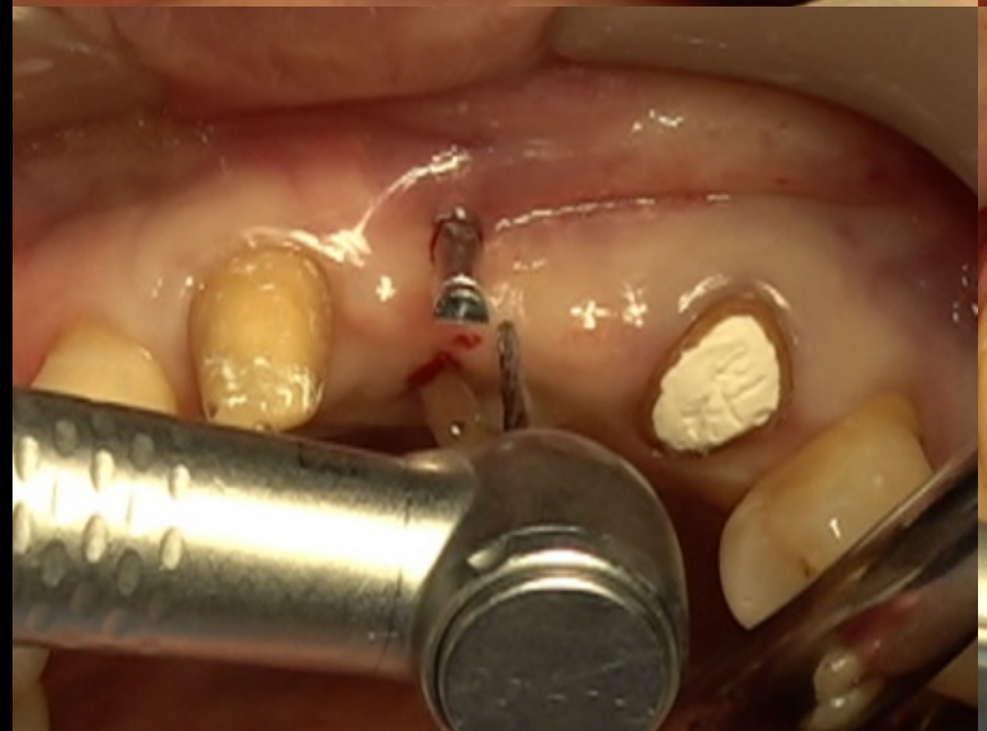
Pre-op (2023-09-06)

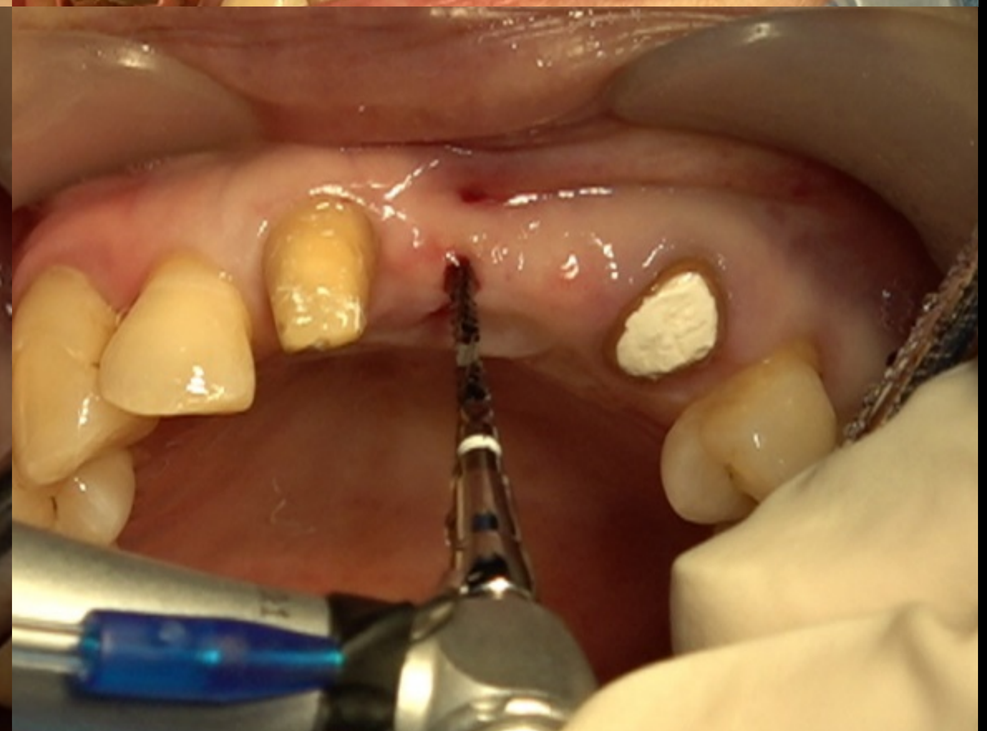
Surgery (2023-09-06)





Guide pin





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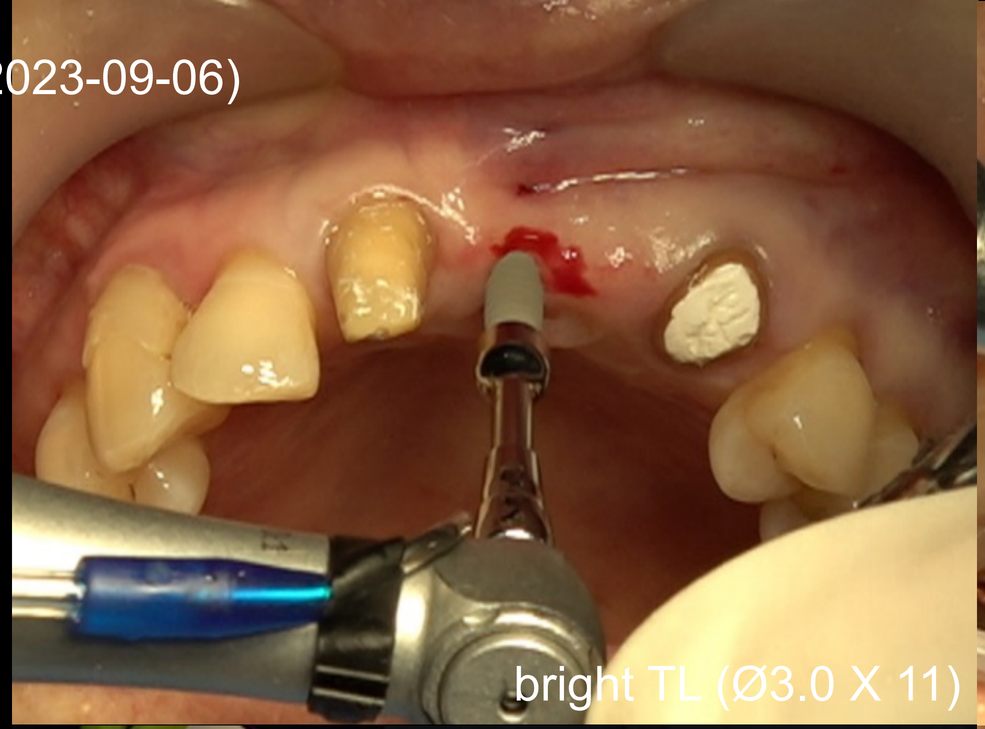

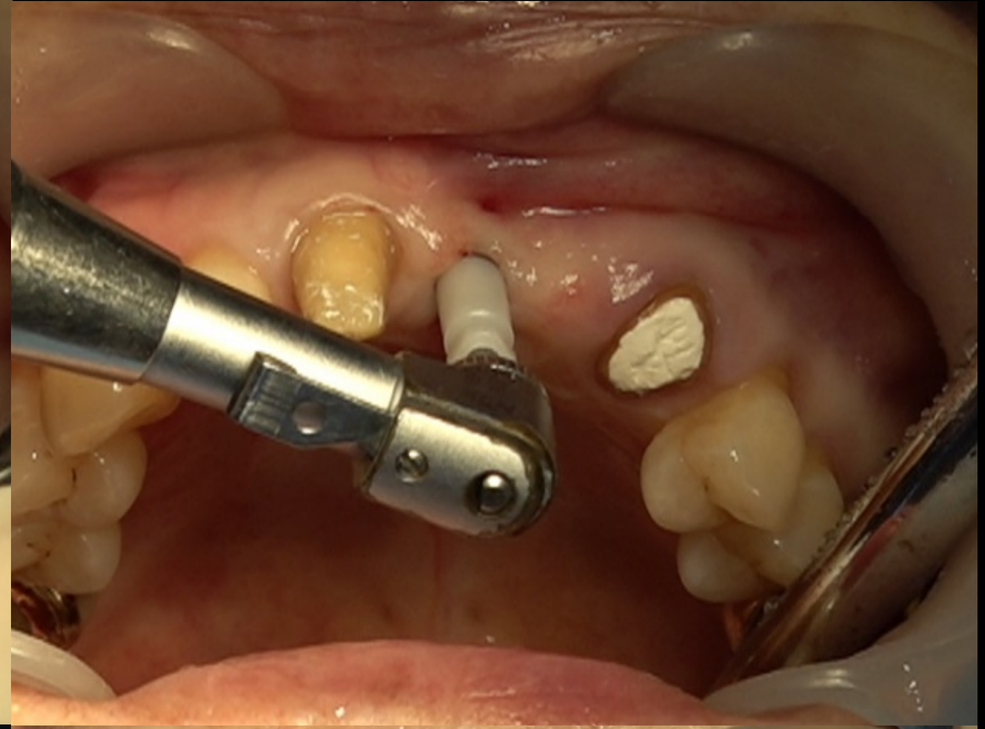

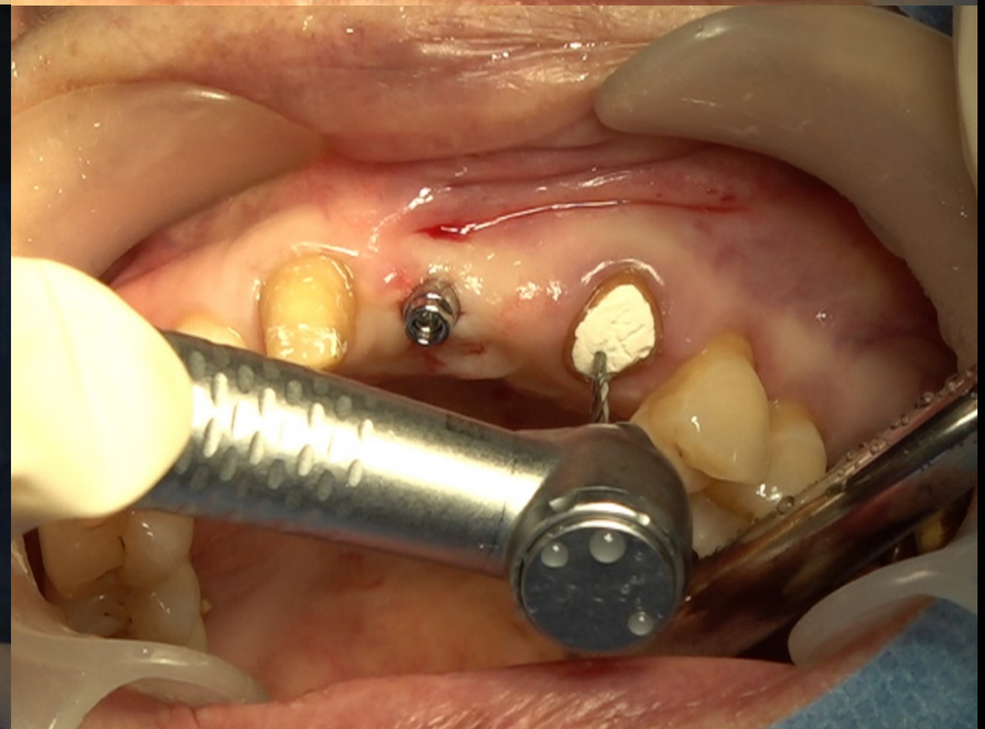

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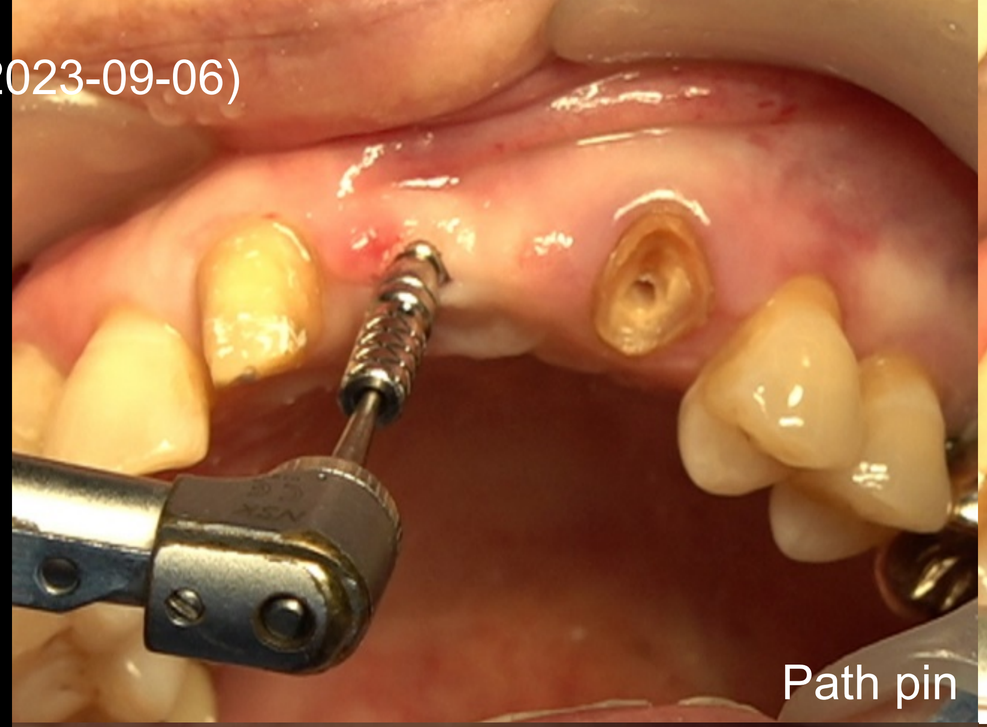
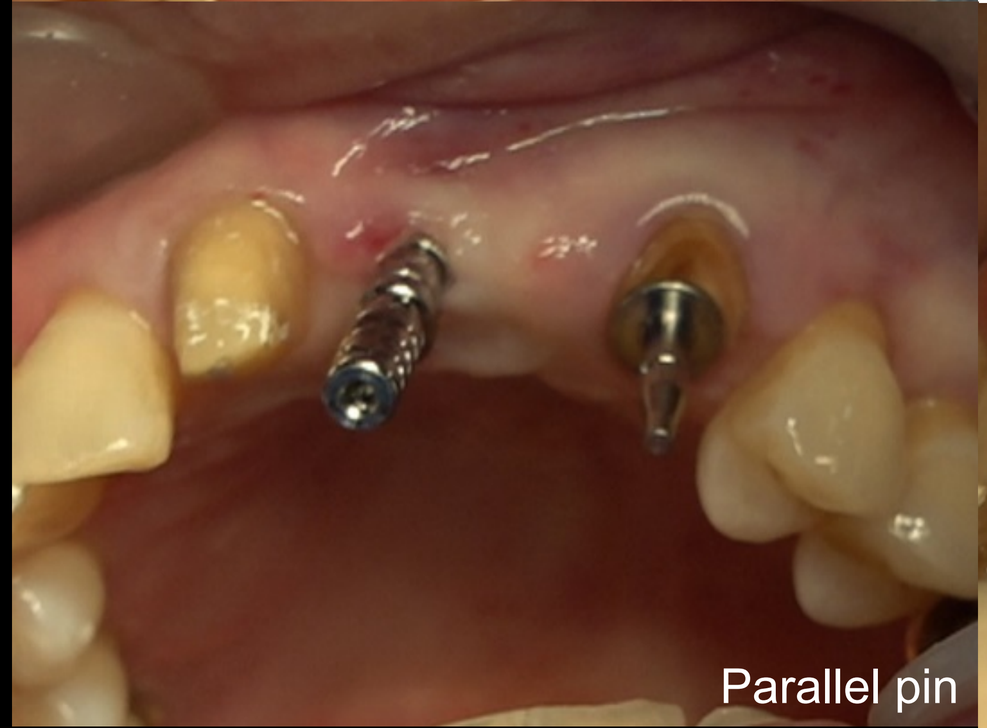

Path pin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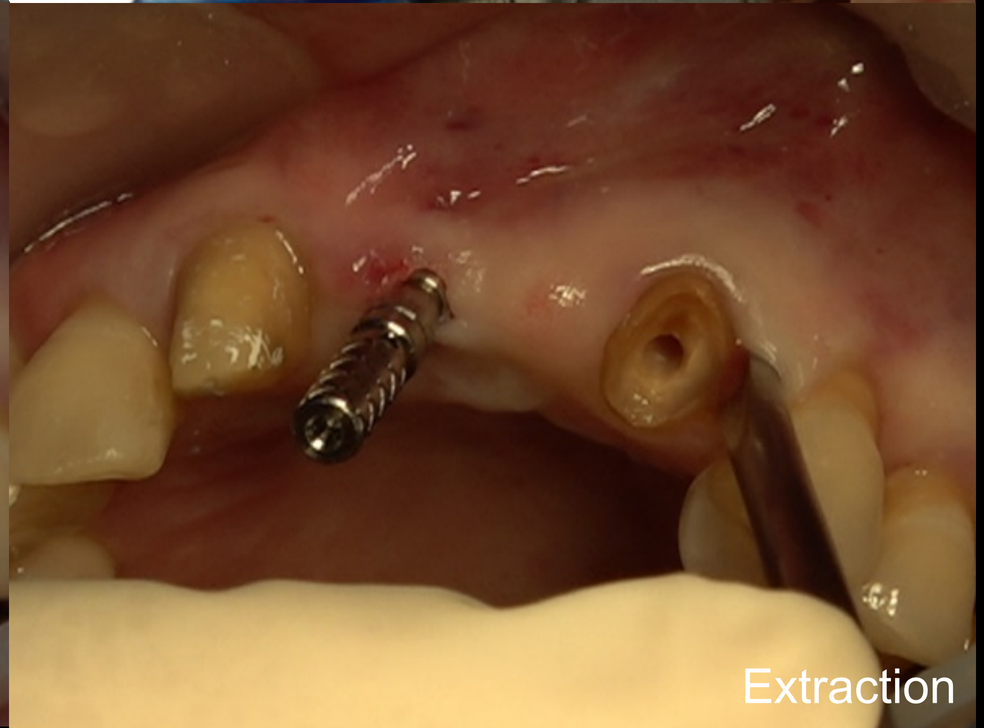
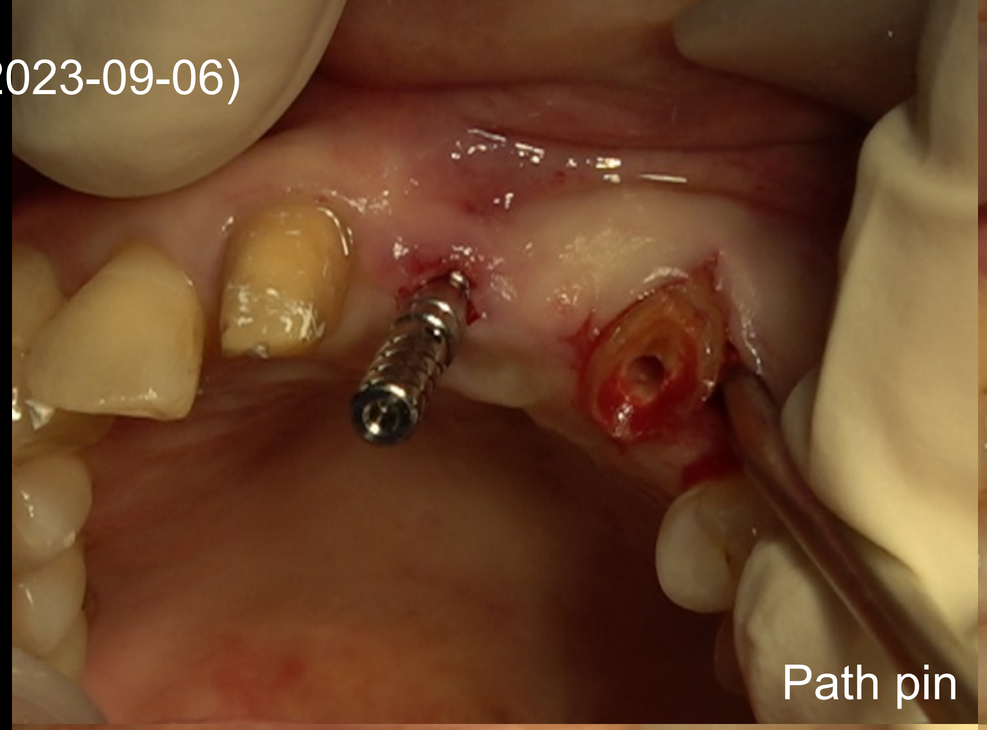
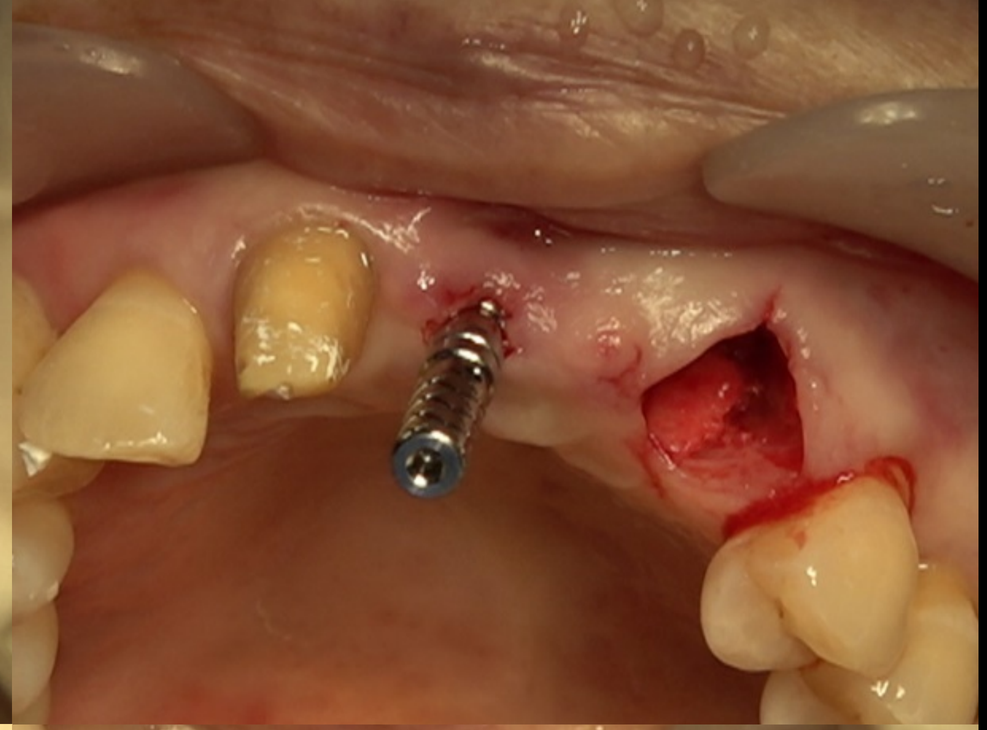
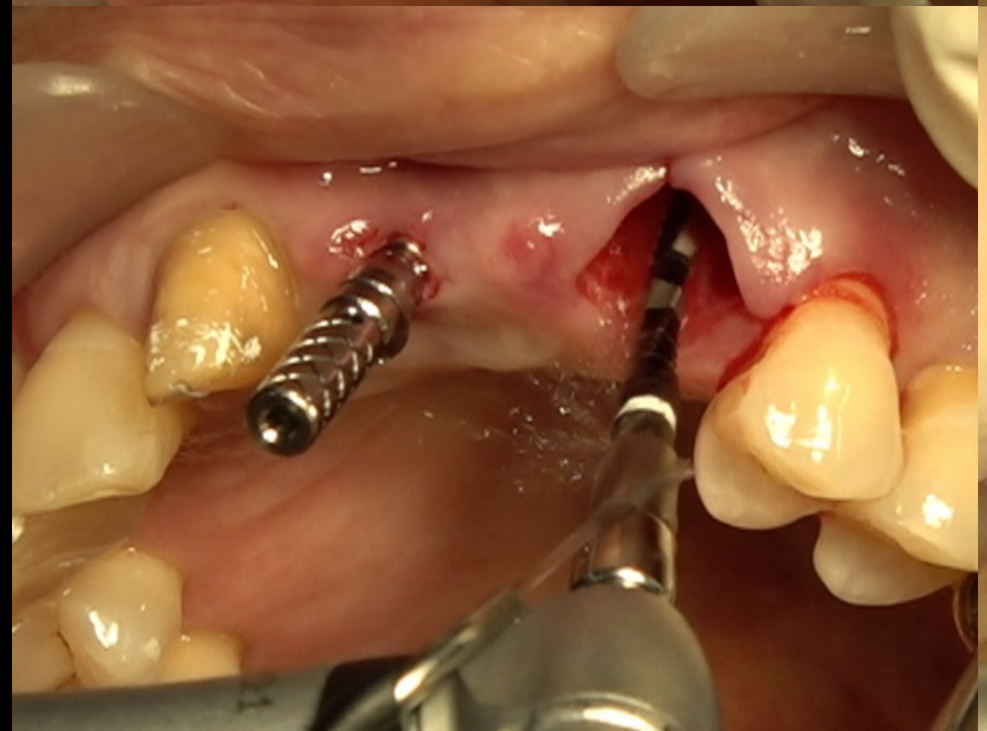
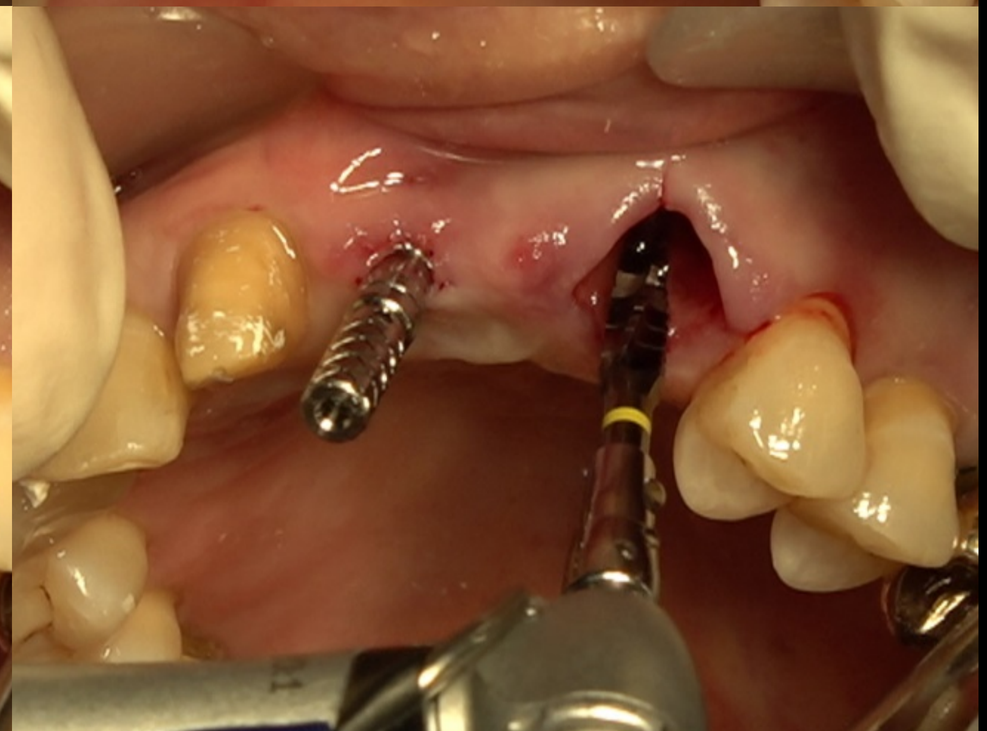

Extraction

Surgery (2023-09-06)









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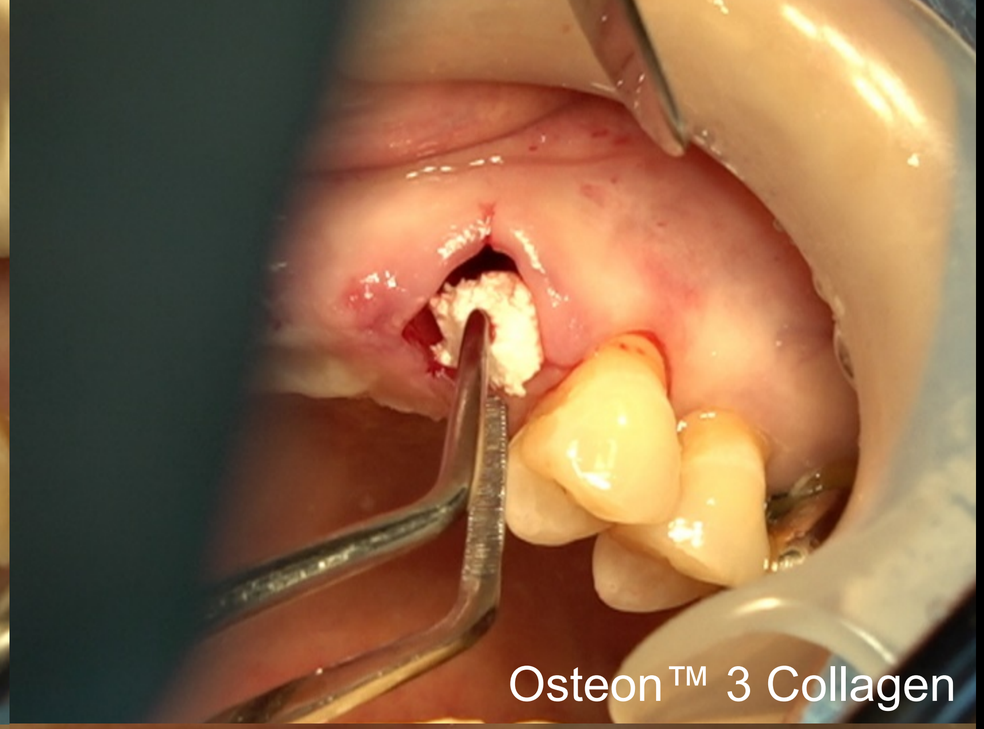
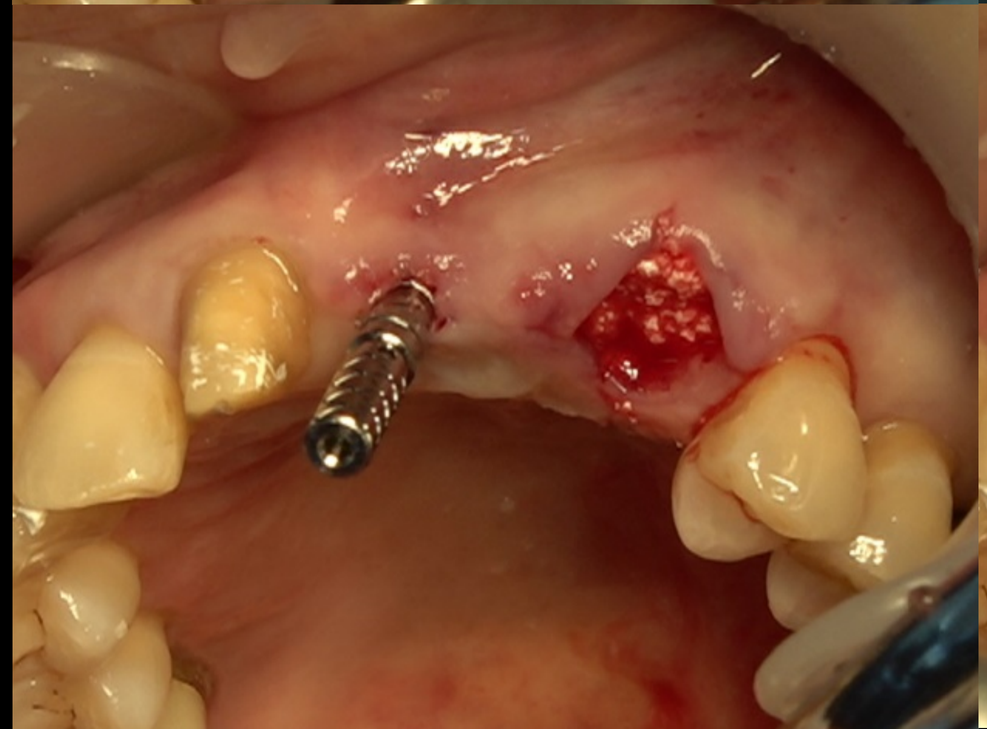
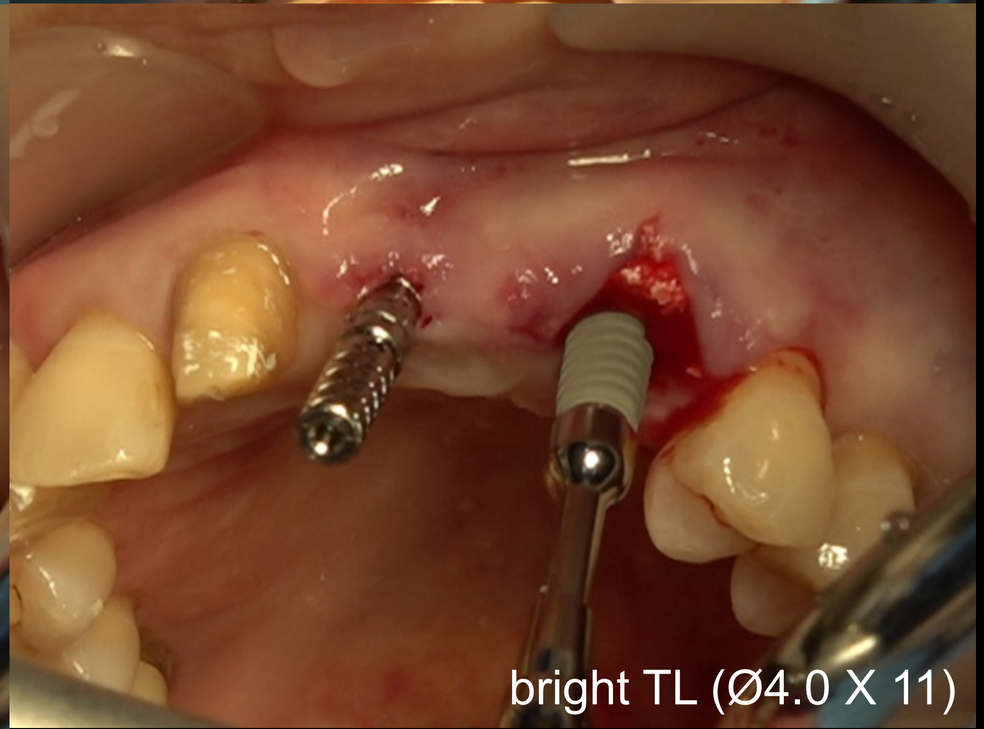


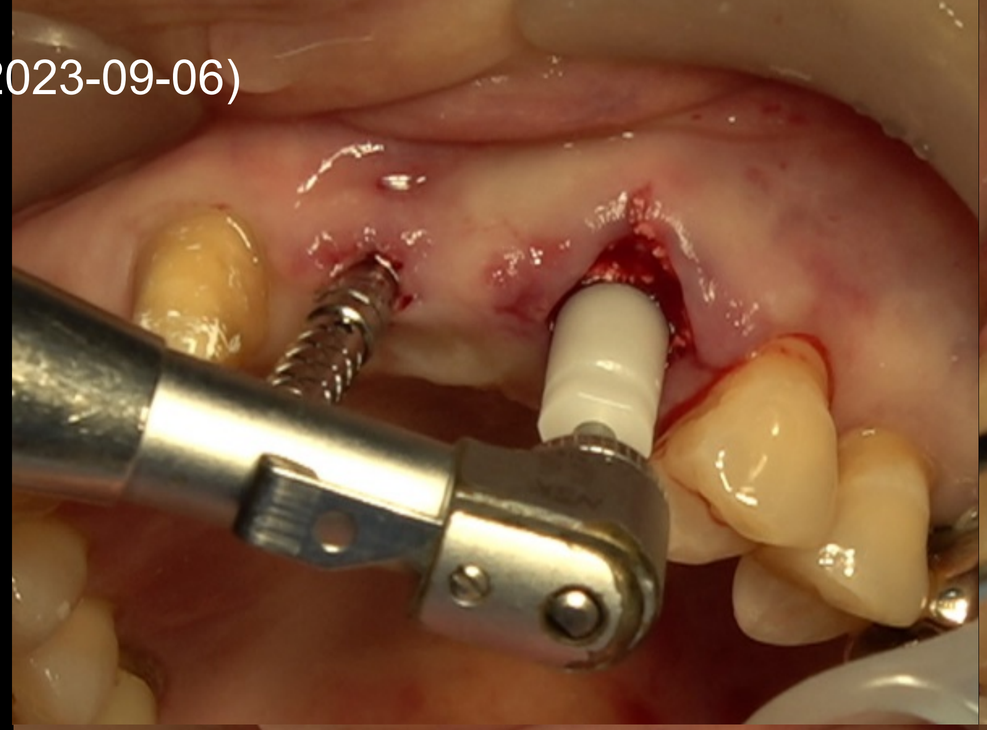
Osteon™ 3 Collagen

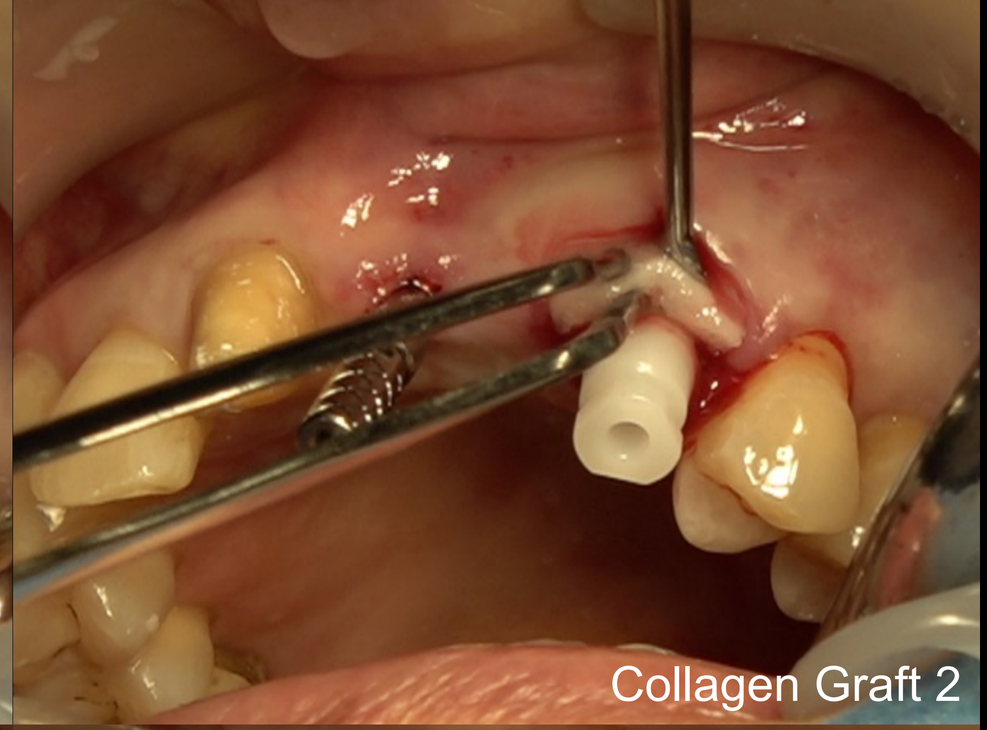




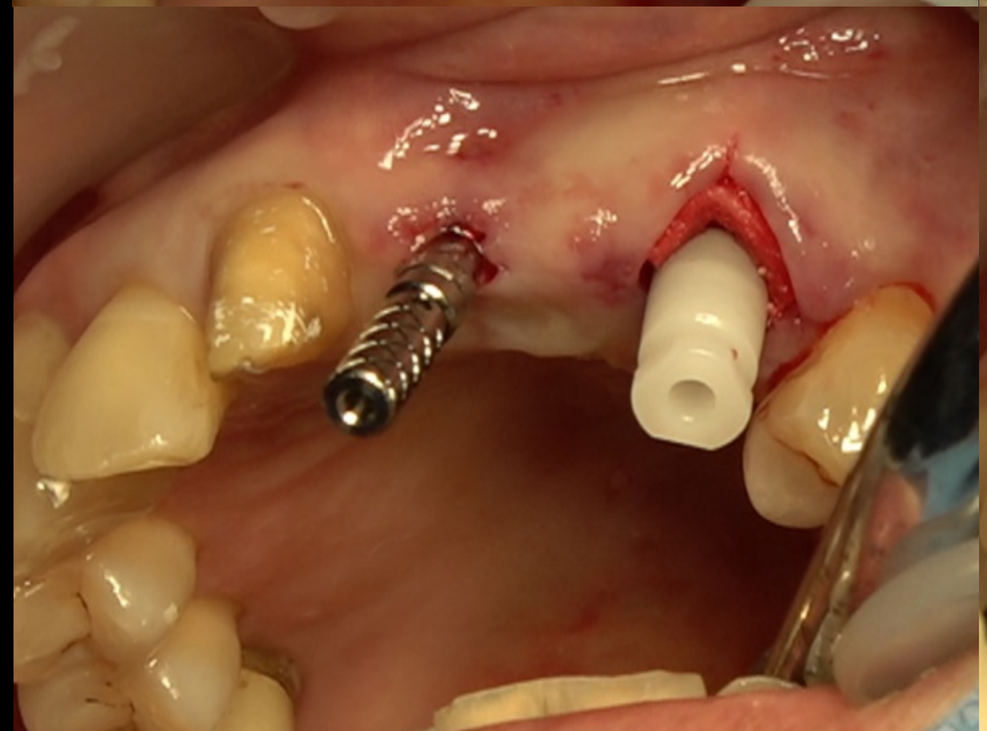
bright TL (Ø4.0 X 11)

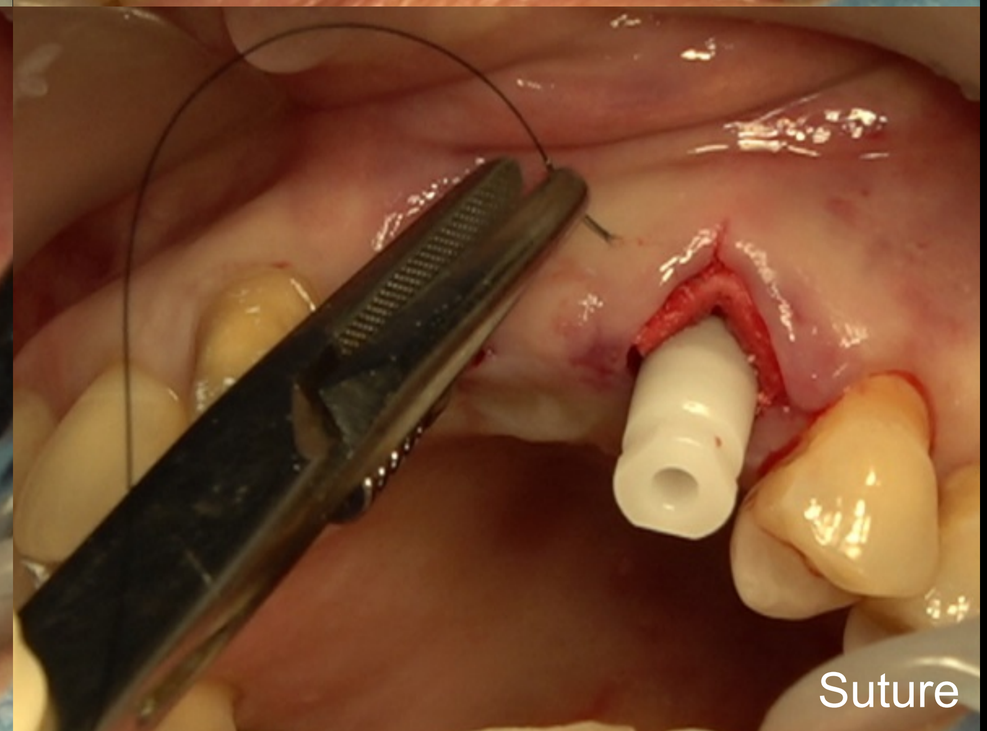
Surgery (2023-09-06)





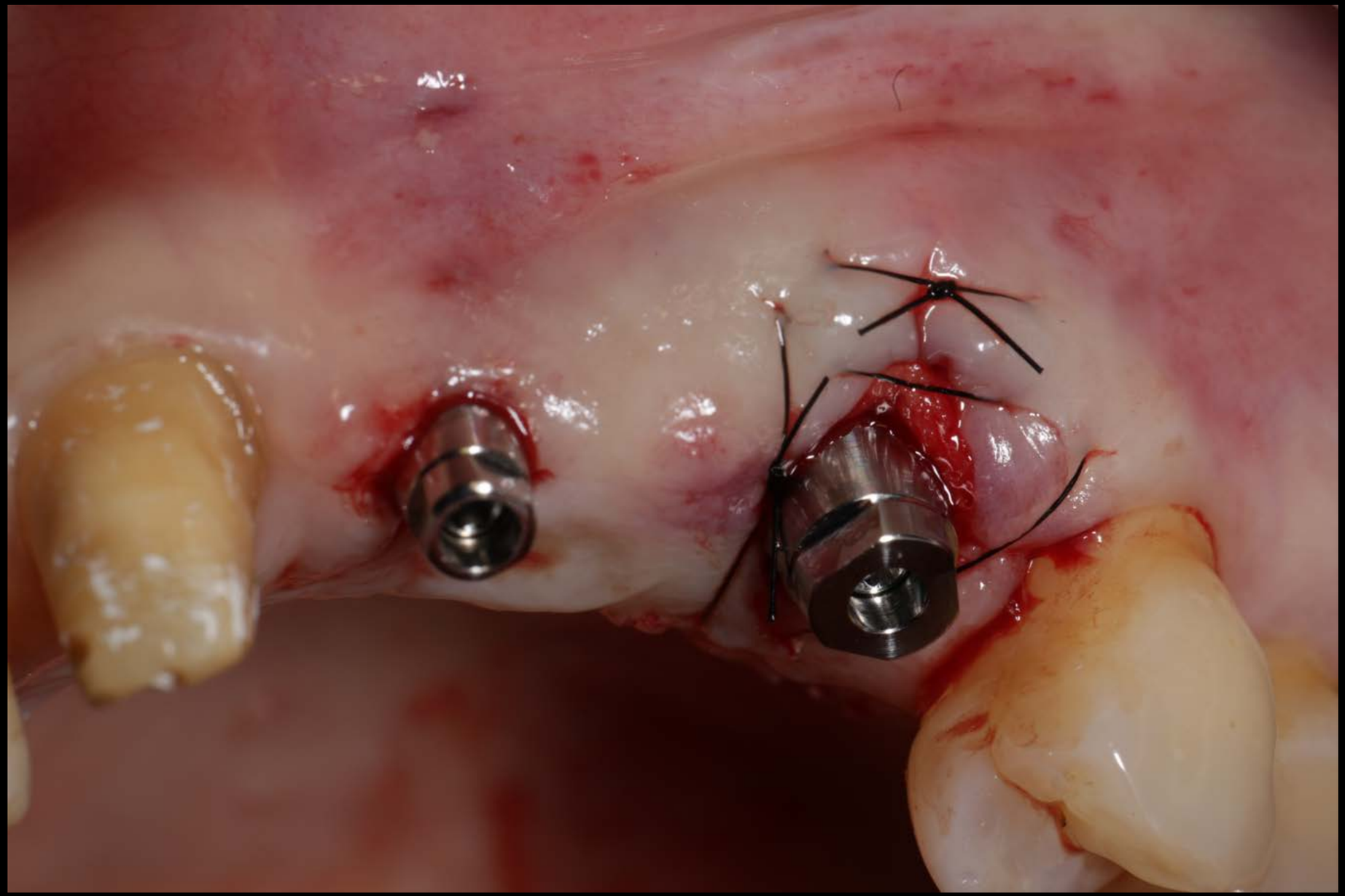
Collagen Graft 2





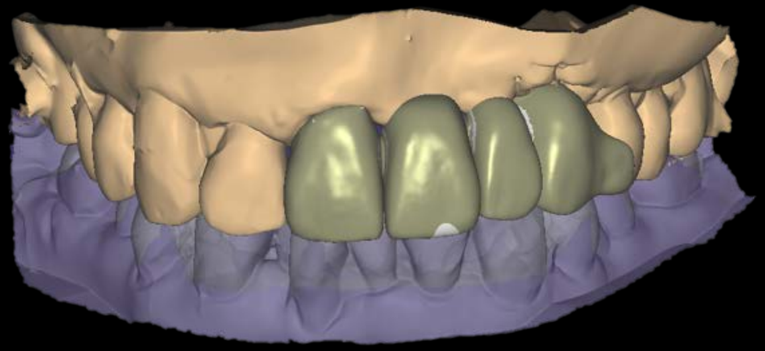
Suture

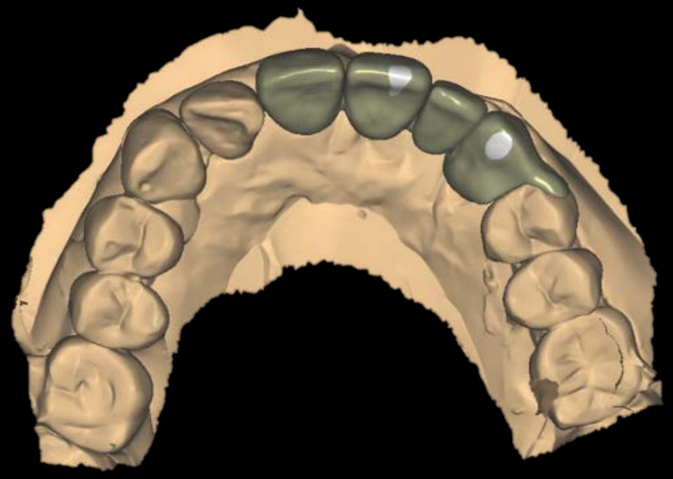
Post-op (2023-09-06)

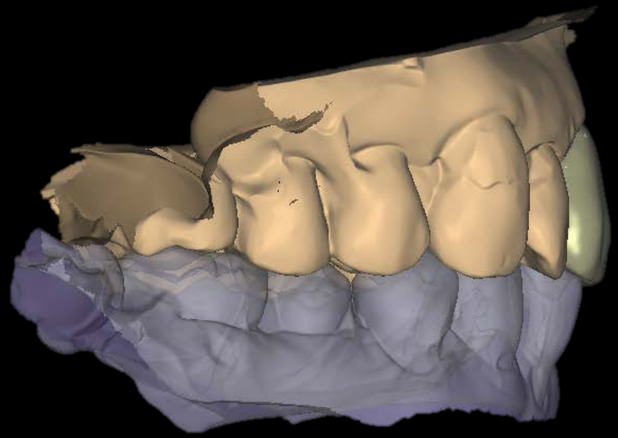


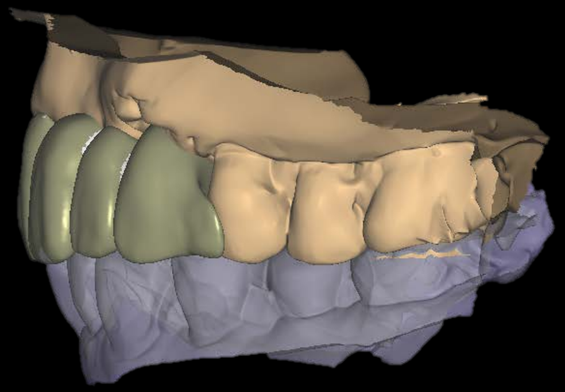
Intra-oral scanning

CAD (Temporary)



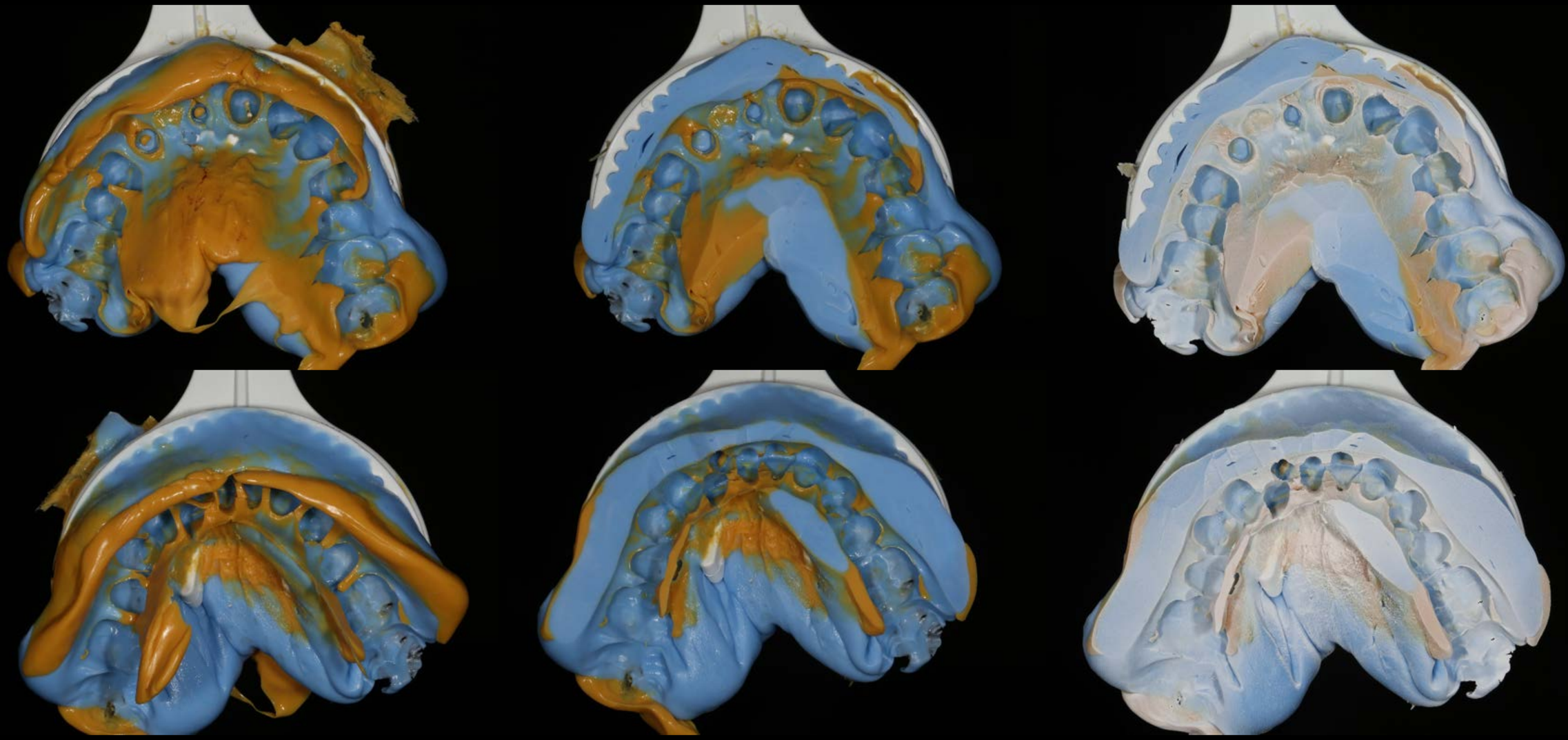




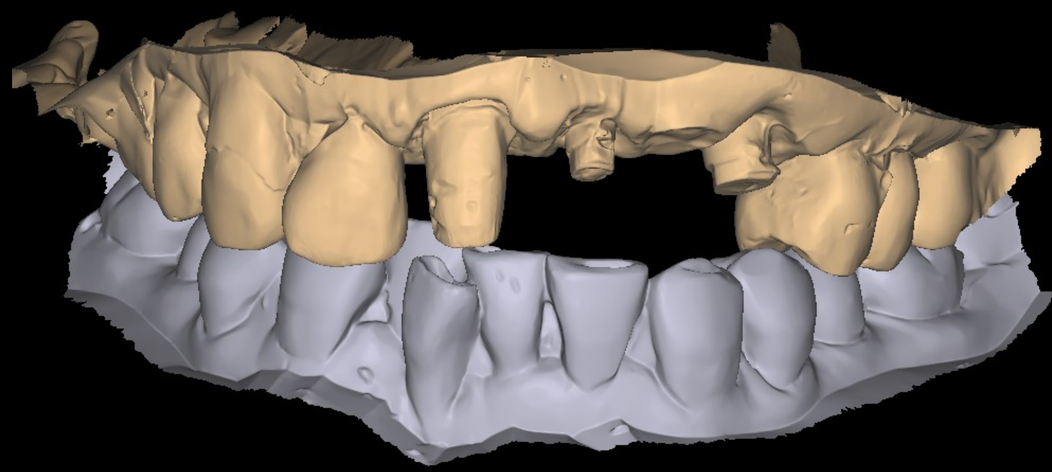


Provisional restoration (2023-11-02)

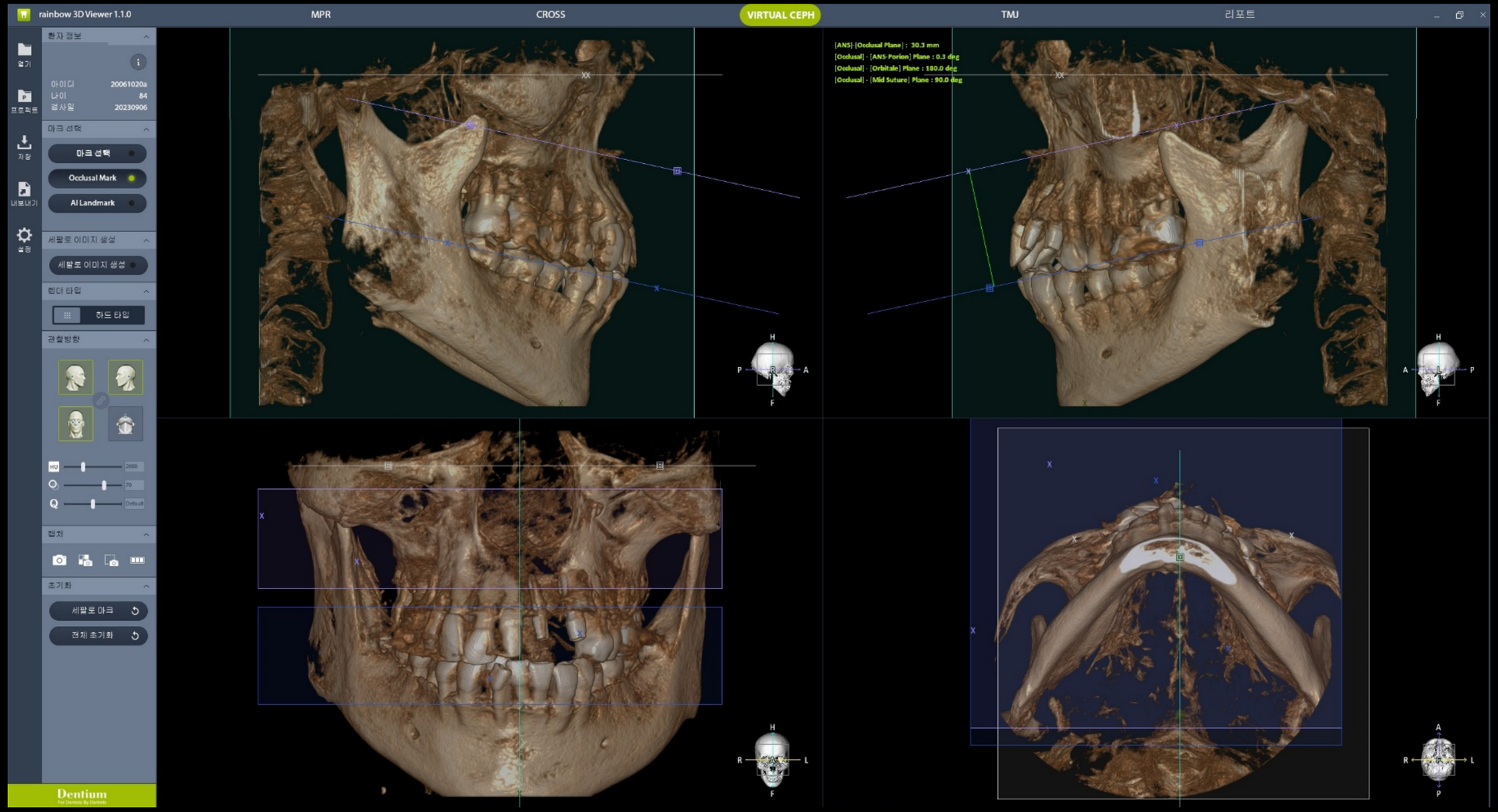
Impression / Trimming / Scan spray



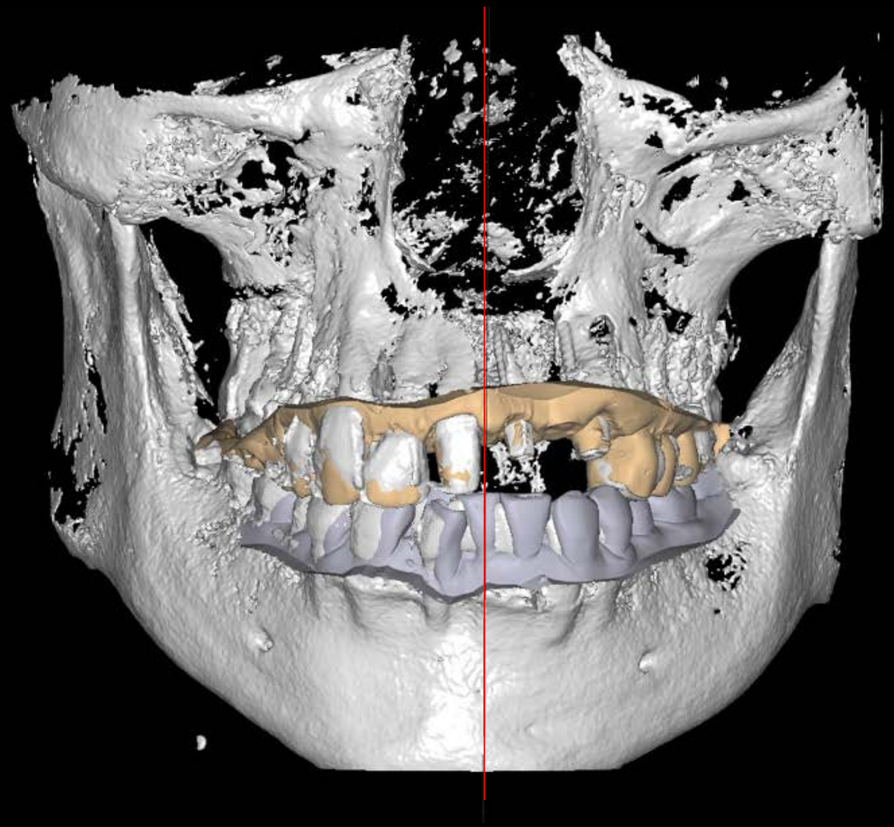
Working Model

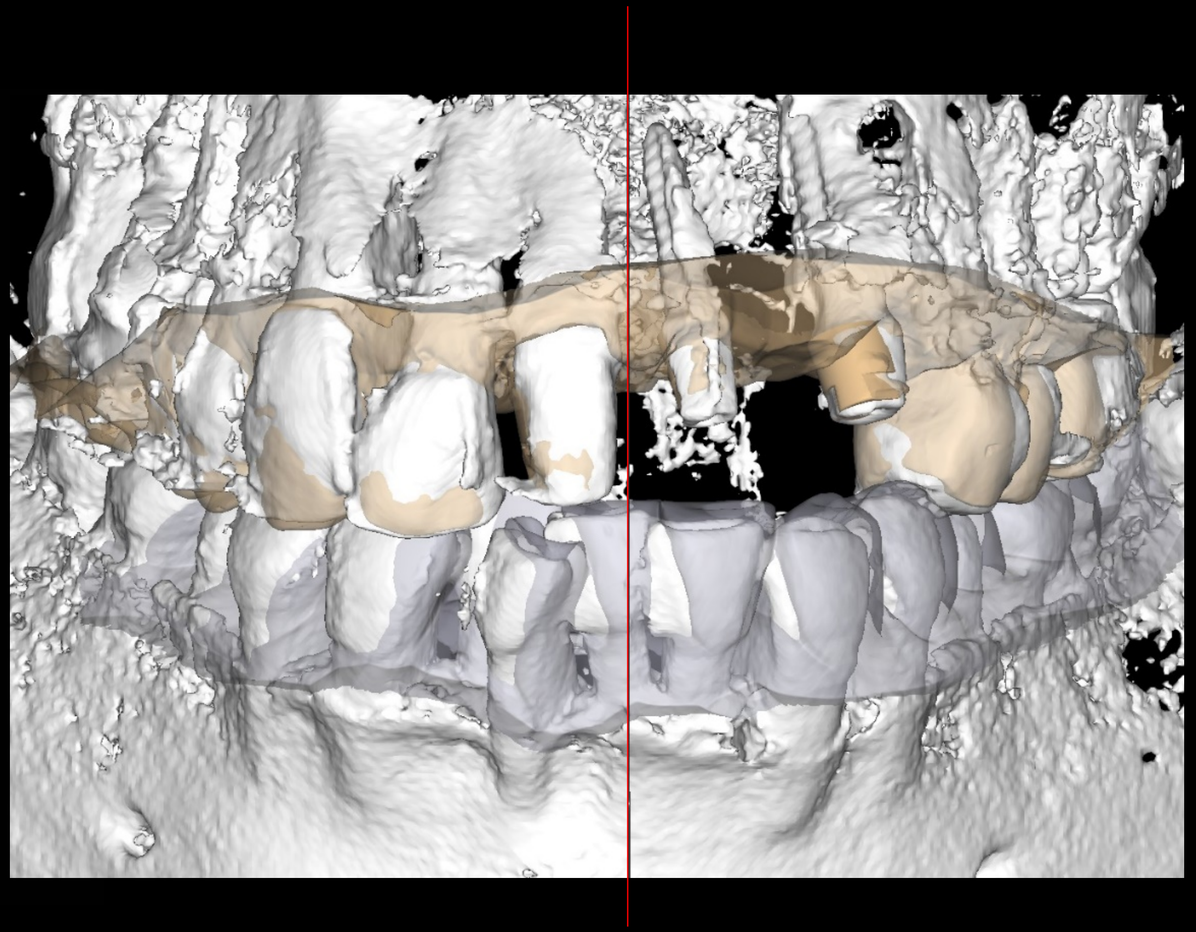


CT STL export (rainbow 3D Viewer)

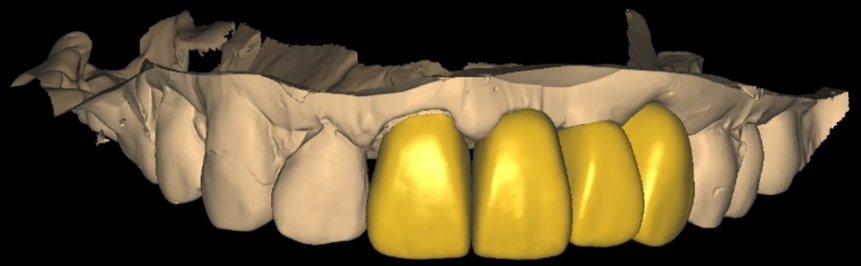


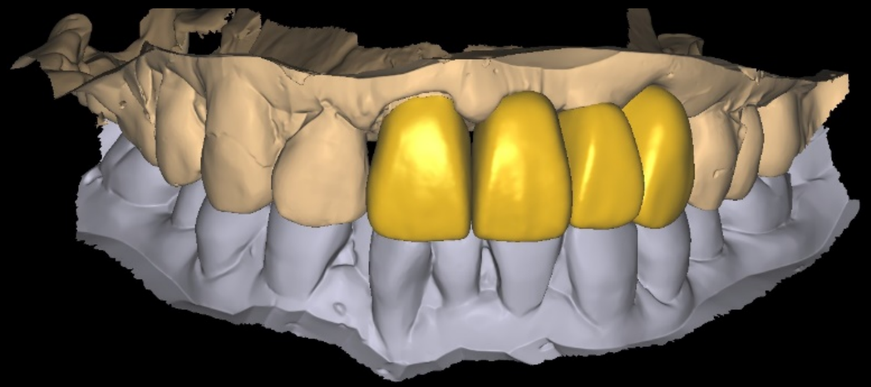
CT STL & working model stitching

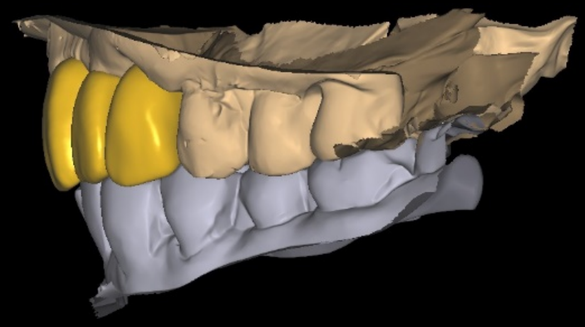




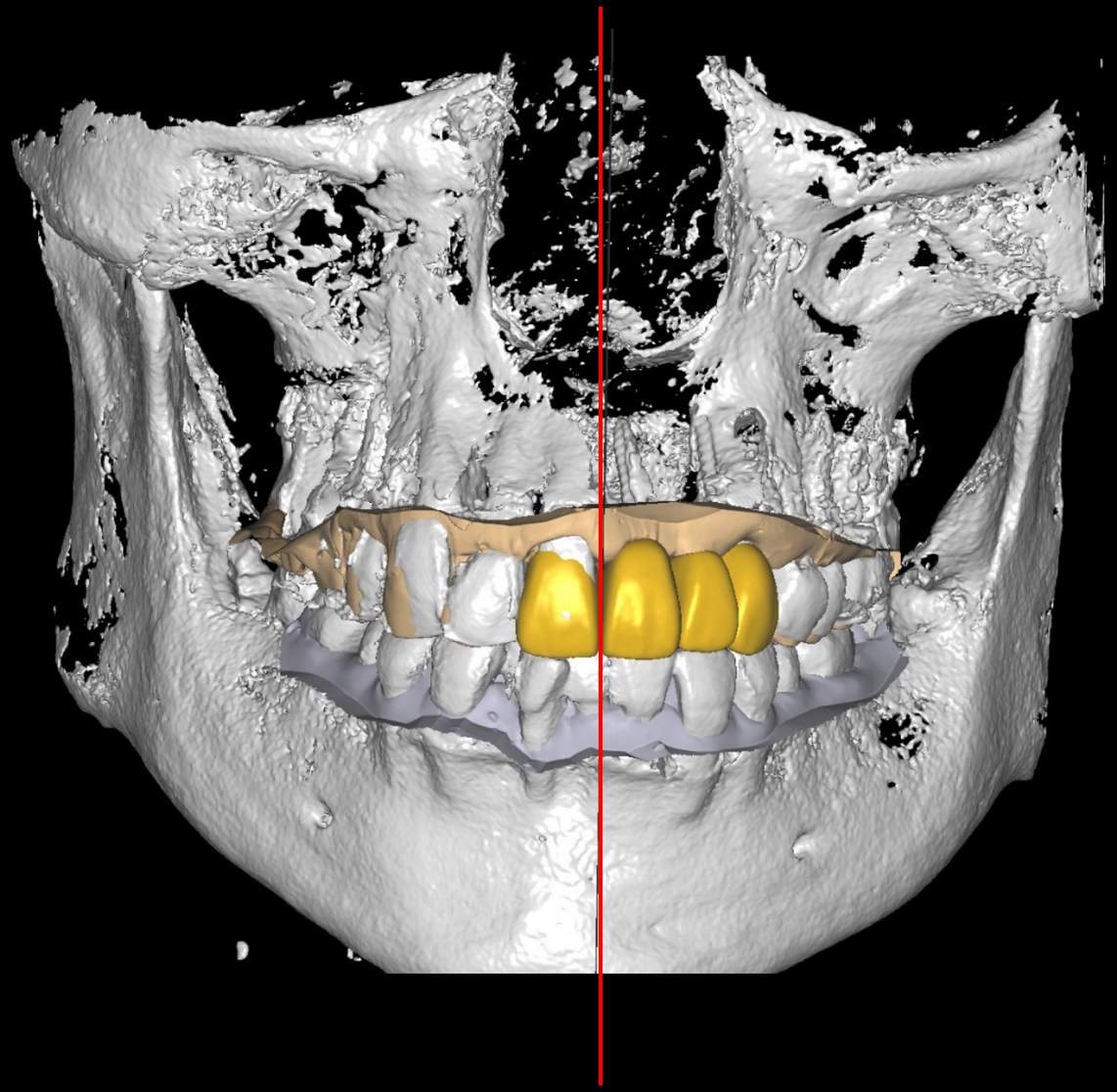
CAD (Final prosthesis)



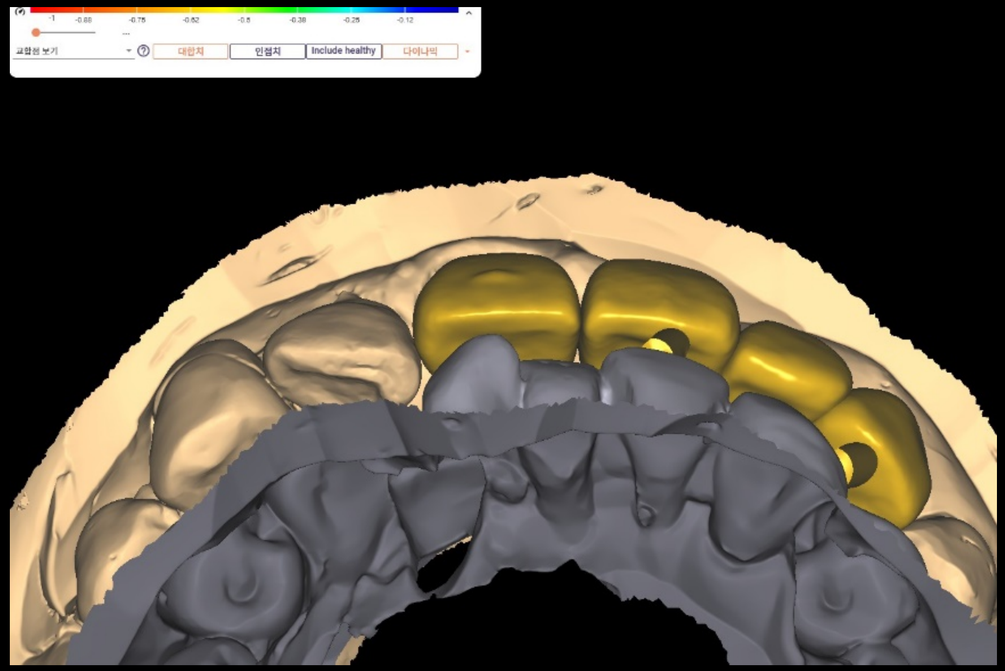




CT – Cad design stitching

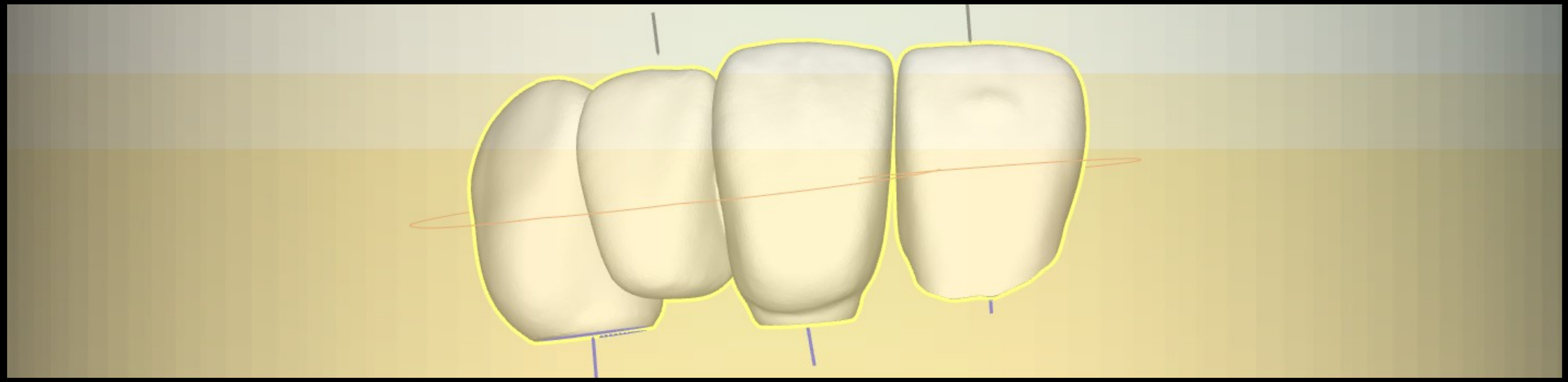


CAD : Mounting with virtual articulator



Shade taking(A3)

Hyper dent



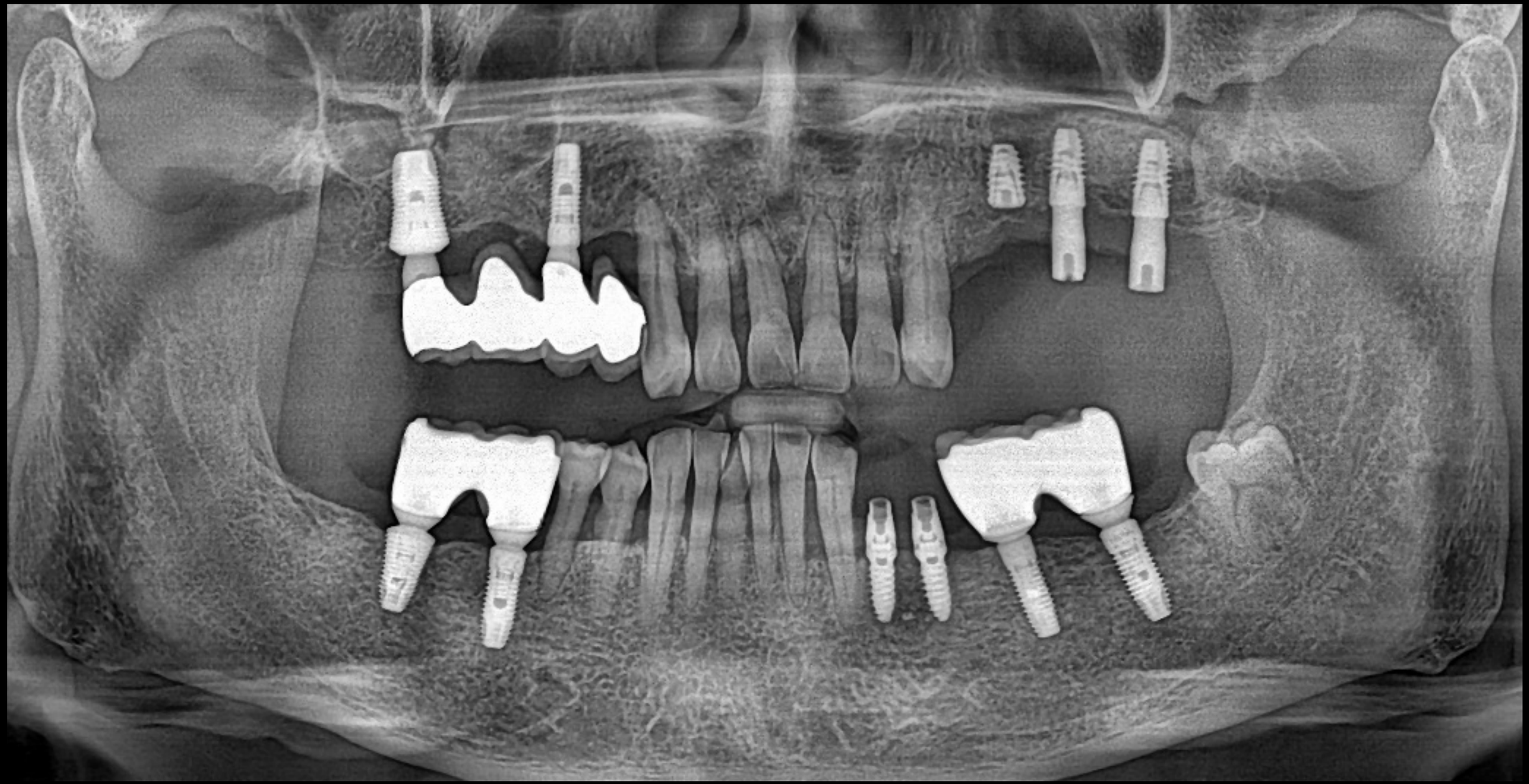
A3 22T 3Layer Block

Milling / Coloring / Sintering / Glazing

Inner – White Opaque

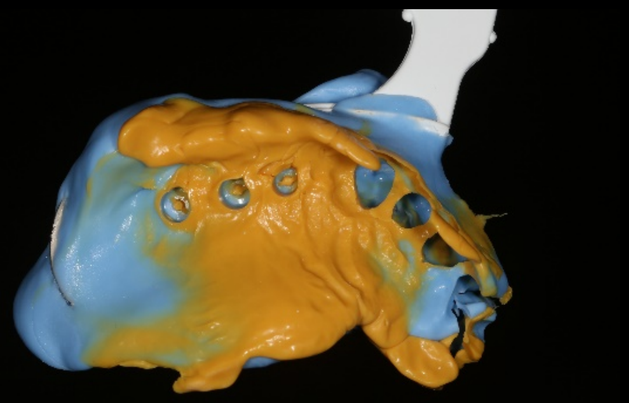
Final prosthesis (2023-11-02)

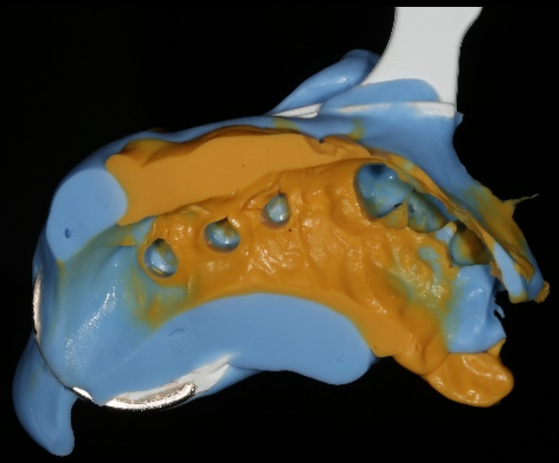
Oral exam

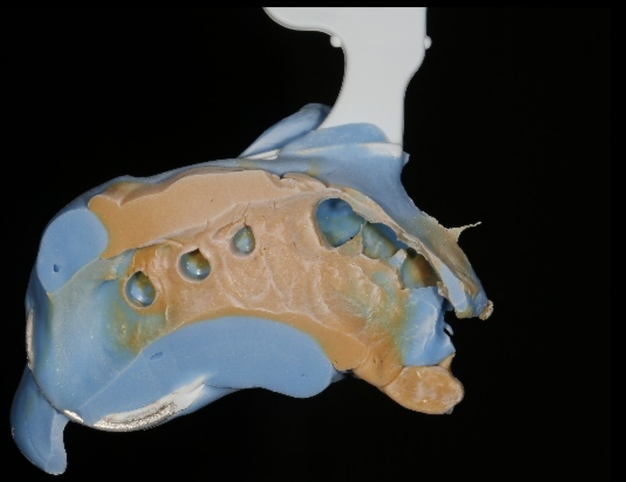


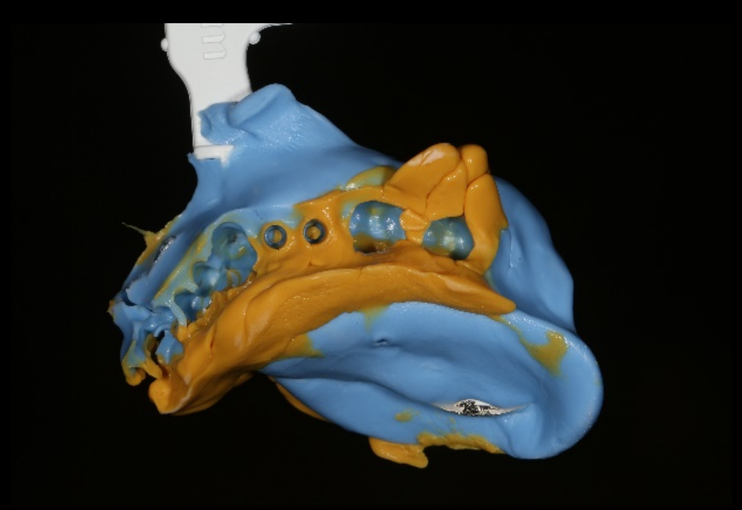
- Bright Impress **Light**
- Bright Impress **Medium**
- Bright Impress **Heavy**
- Bright Impress **Bite**
- Bright Impress **Putty**
- Bright **Bite Tray**

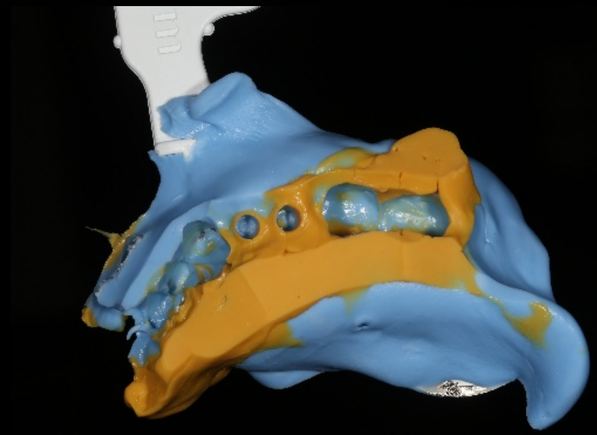
Impression / Trimming / Scan spray

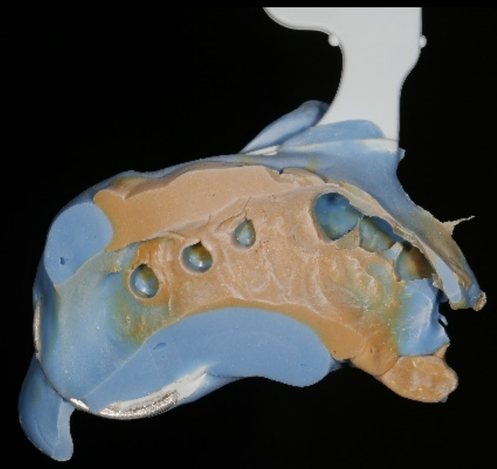






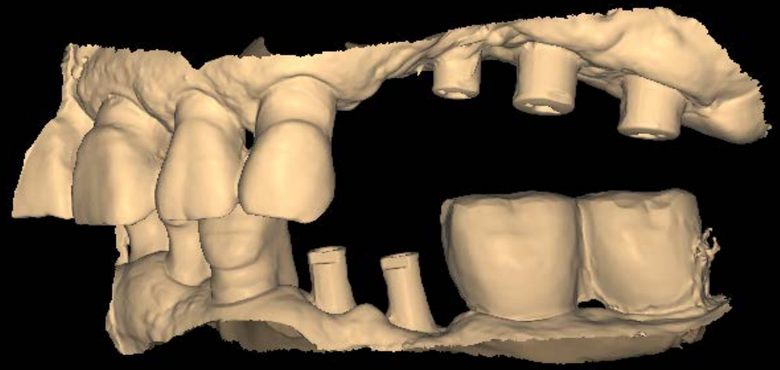


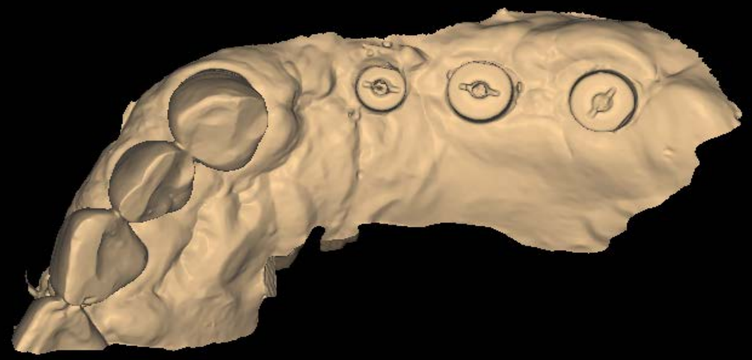


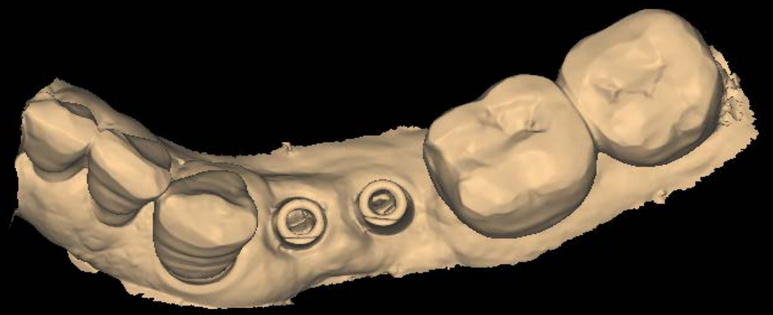


Impression scan / Working Model

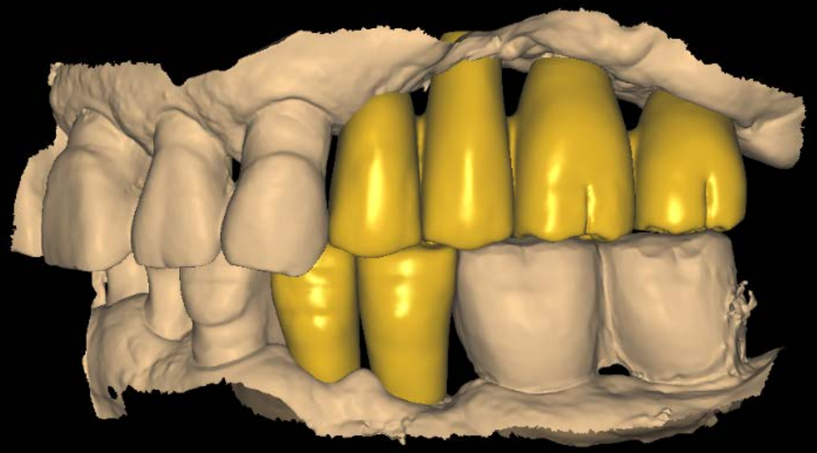
Shining 3D
AutoScan-DS-EX Pro (H)

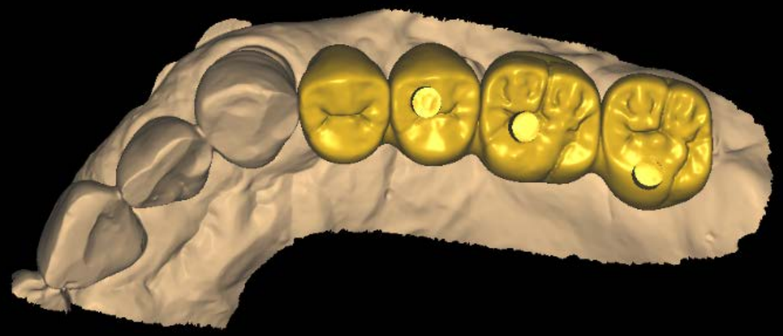


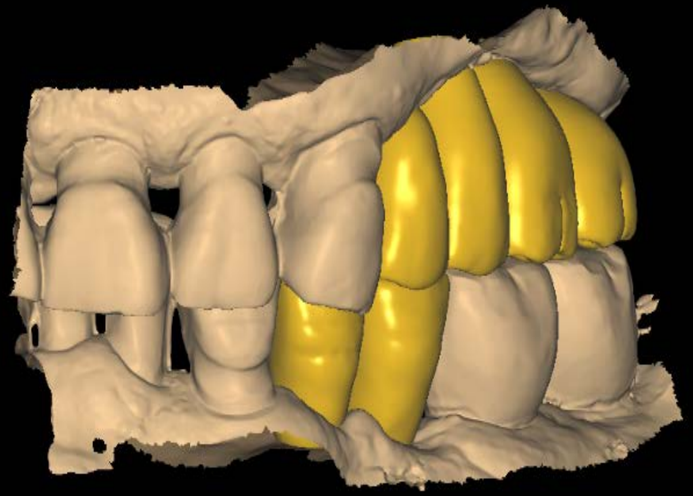




CAD







Final prosthesis

Contents

BTS
Diverse applications of CT viewers
Zirconia block
Auxiliary

Virtual Set up

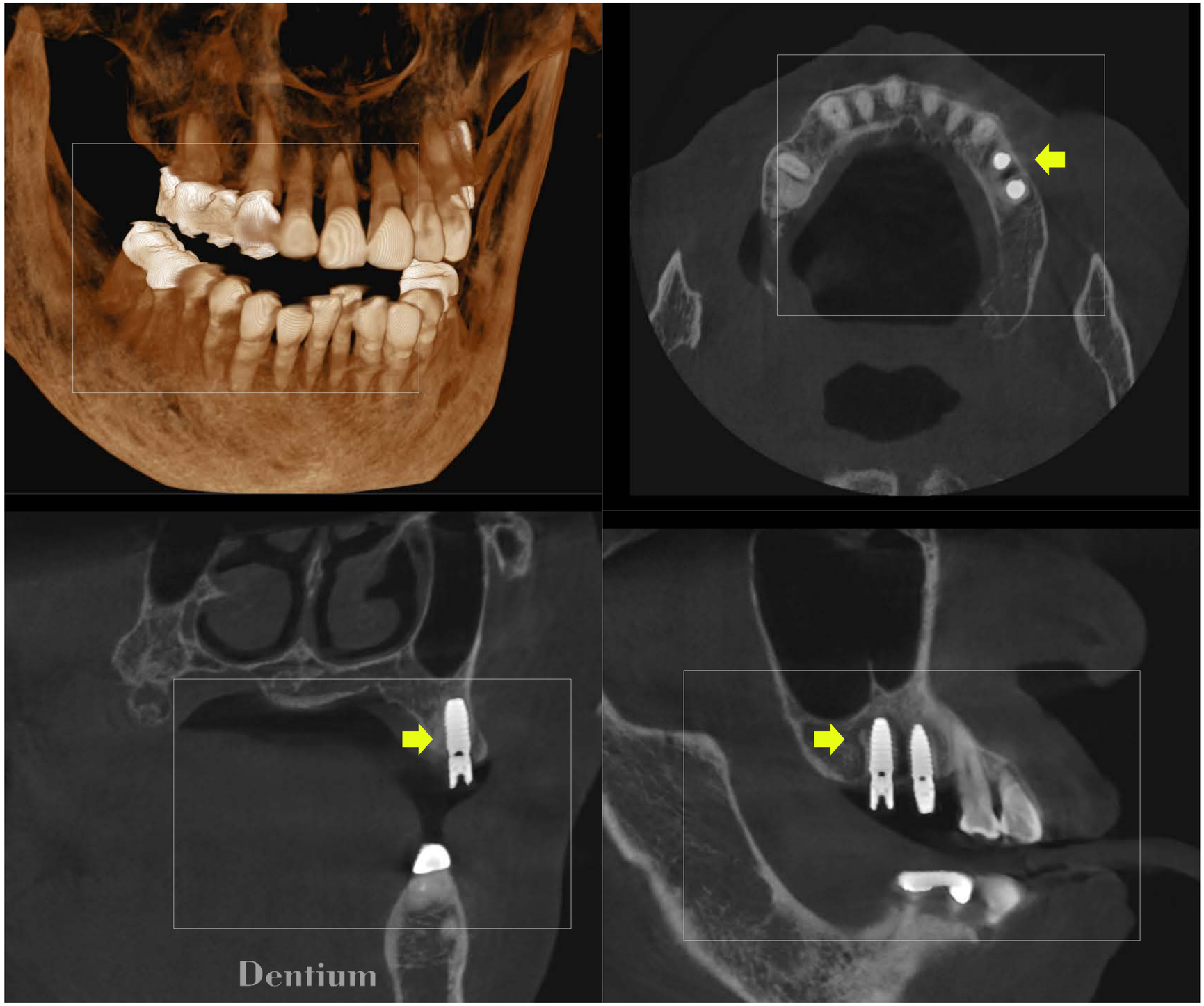
Virtual Set up

VD 2mm

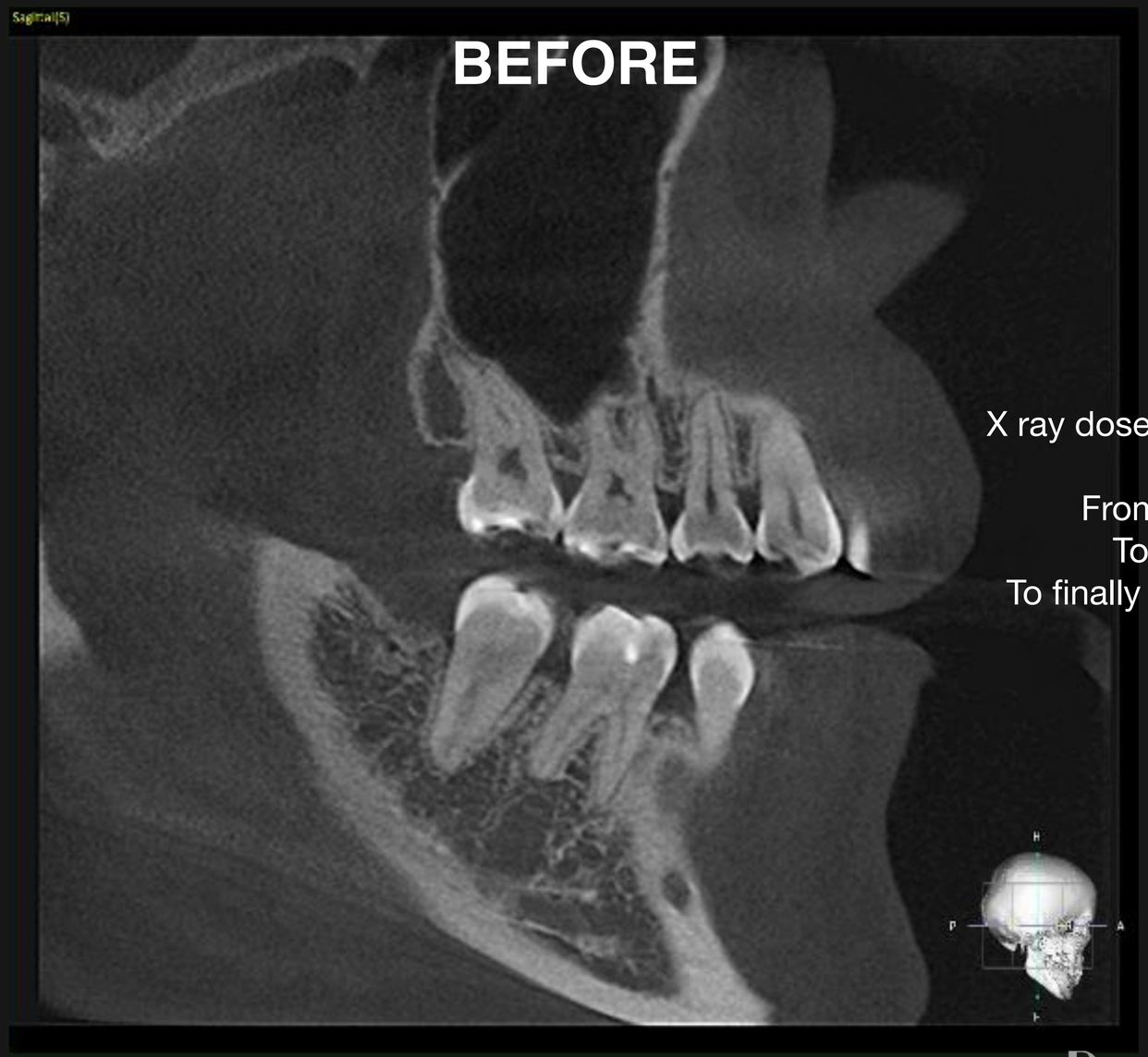
CT viewer
Bright CT and Rainbow CT

CT viewer of
Bright CT
Rainbow CT

MAR
(Metal Artifact Reduction)

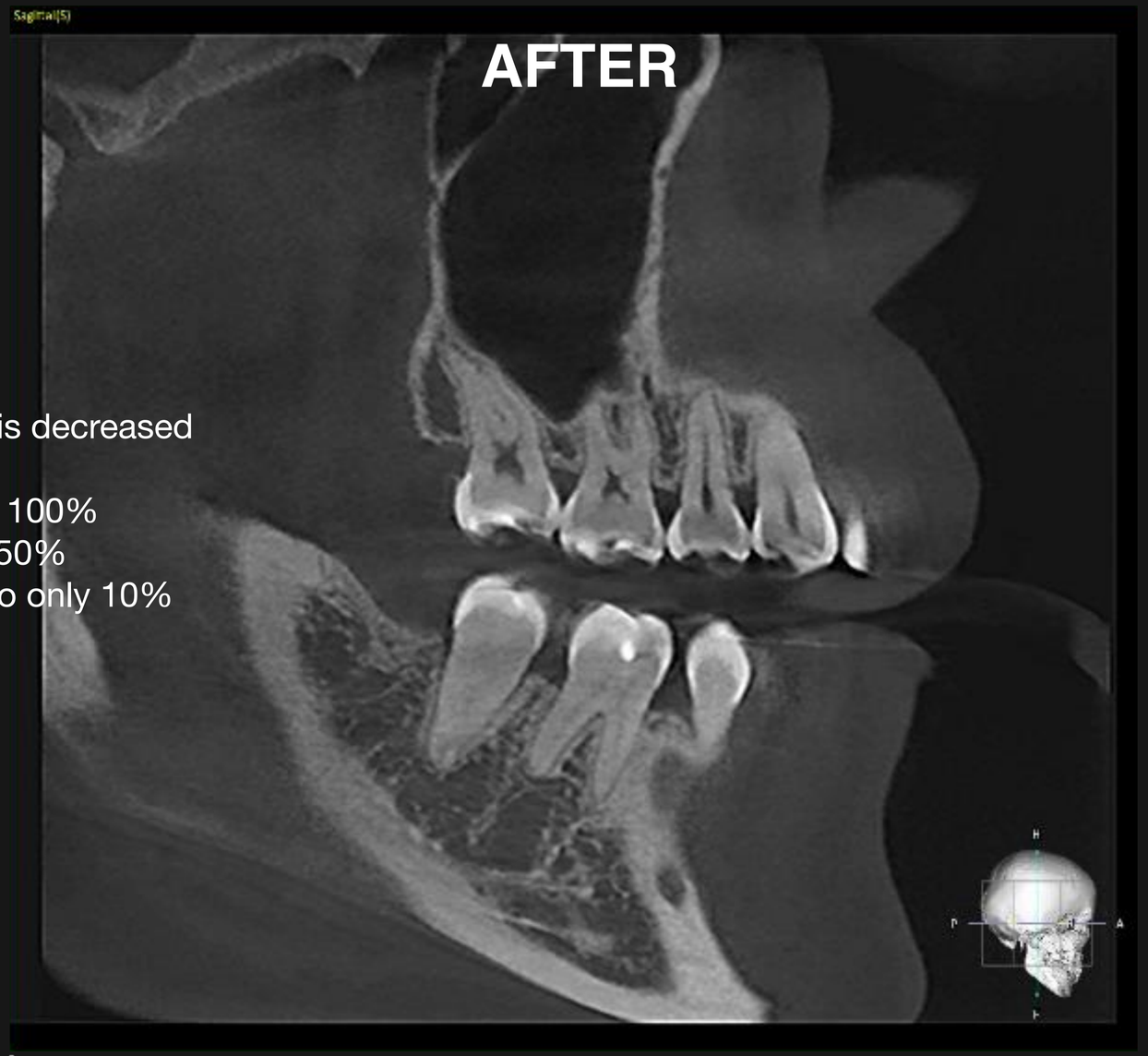


CT Image Upgrade De-noising with A.I



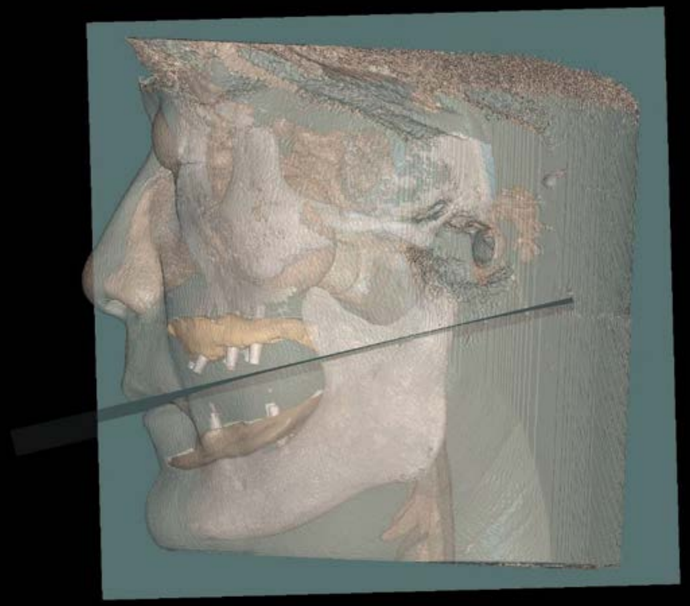
X ray dose is decreased

From 100%
To 50%
To finally to only 10%



Dentium

rainbow™ 3D Viewer

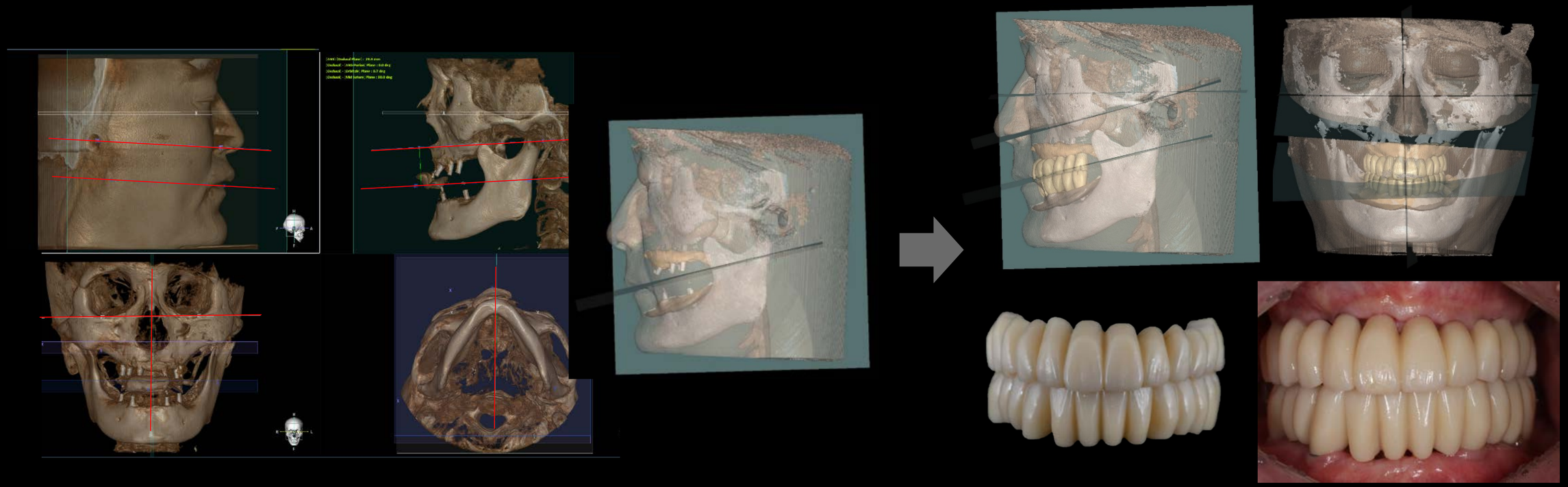


Digital dentistry with AI

AUTO AUTO AUTO AUTO

3D Viewer **AI Occlusal Plane**

Auto Set occlusal plane from anatomical landmark on CT



3D Viewer **AI Occlusal Plane**

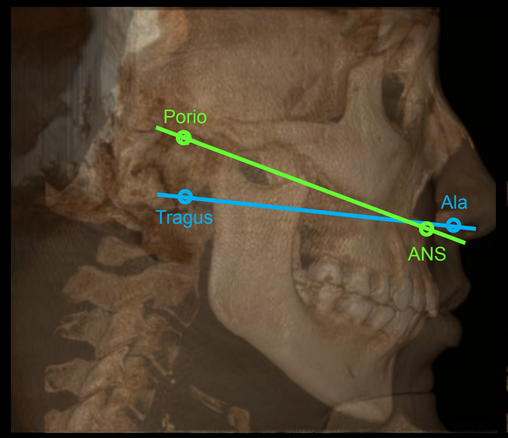
Auto Set occlusal plane from anatomical landmark on CT

1) Auto Set the plane

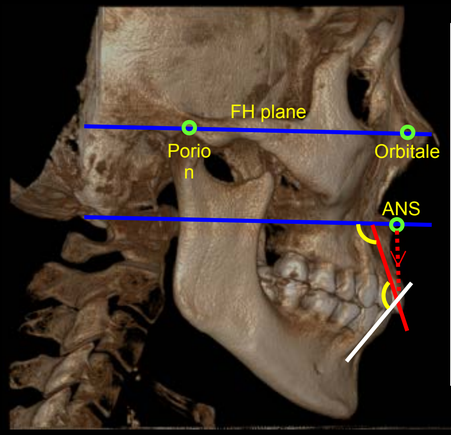
2) Export the CT data

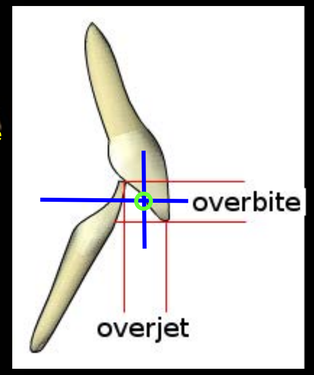
3) All of data stitching

4) Prosthesis Design



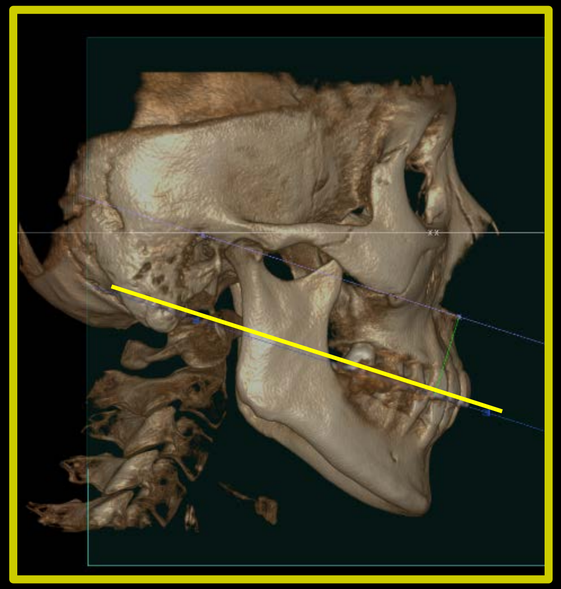
1) Occlusal plan angle





overbite, overjet : 2~3mm

2) Occlusal plan Vertical height



3D Viewer **AI Occlusal Plane**

Auto Set occlusal plane from anatomical landmark on CT

1) Auto Set the plane

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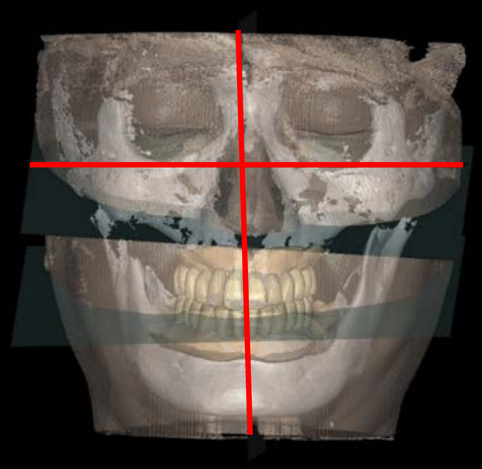
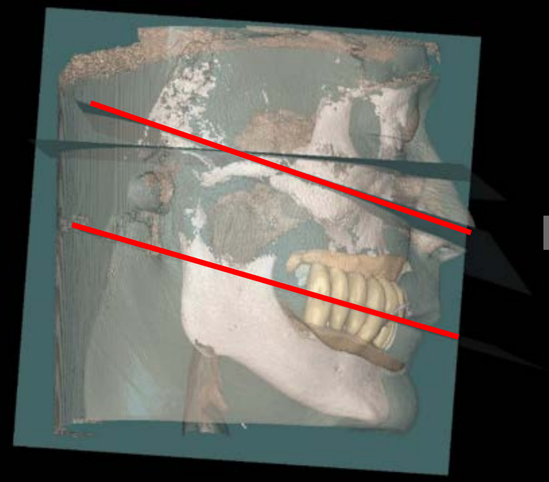
3) All of data stitching

4) Prosthesis Design

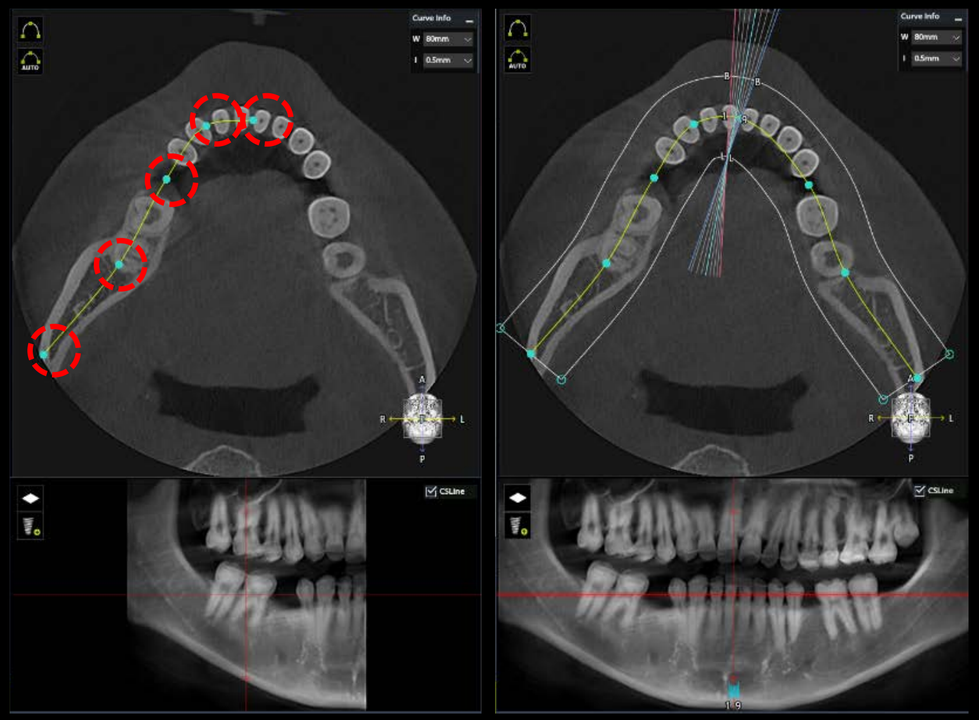




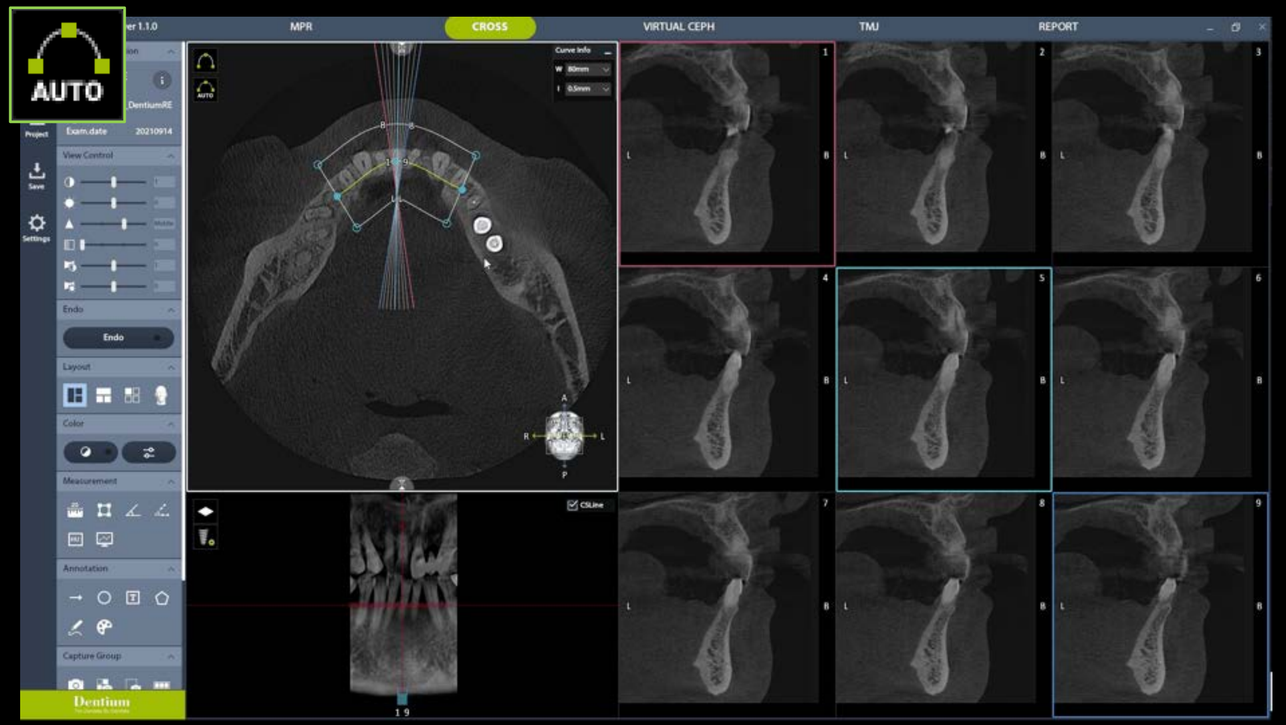
Final prosthesis

3D Viewer **AI Auto Arch Detection**

AI Auto Arch Detection



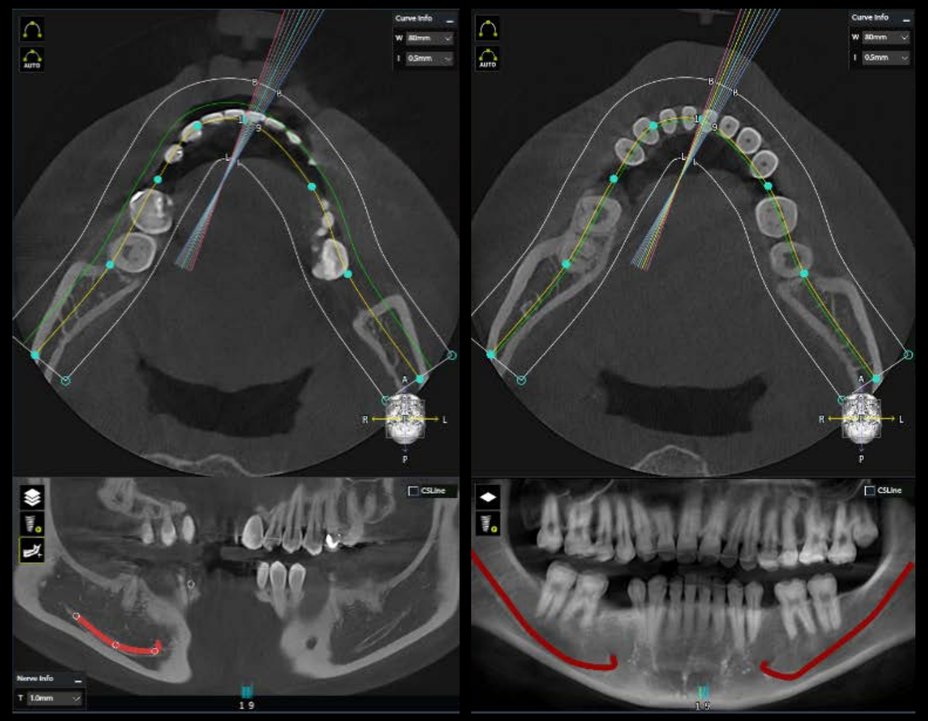
Manual



AI dental arch auto detection, error <1.14mm

3D Viewer **AI Auto Nerve Detection**

AI Auto Nerve Detection

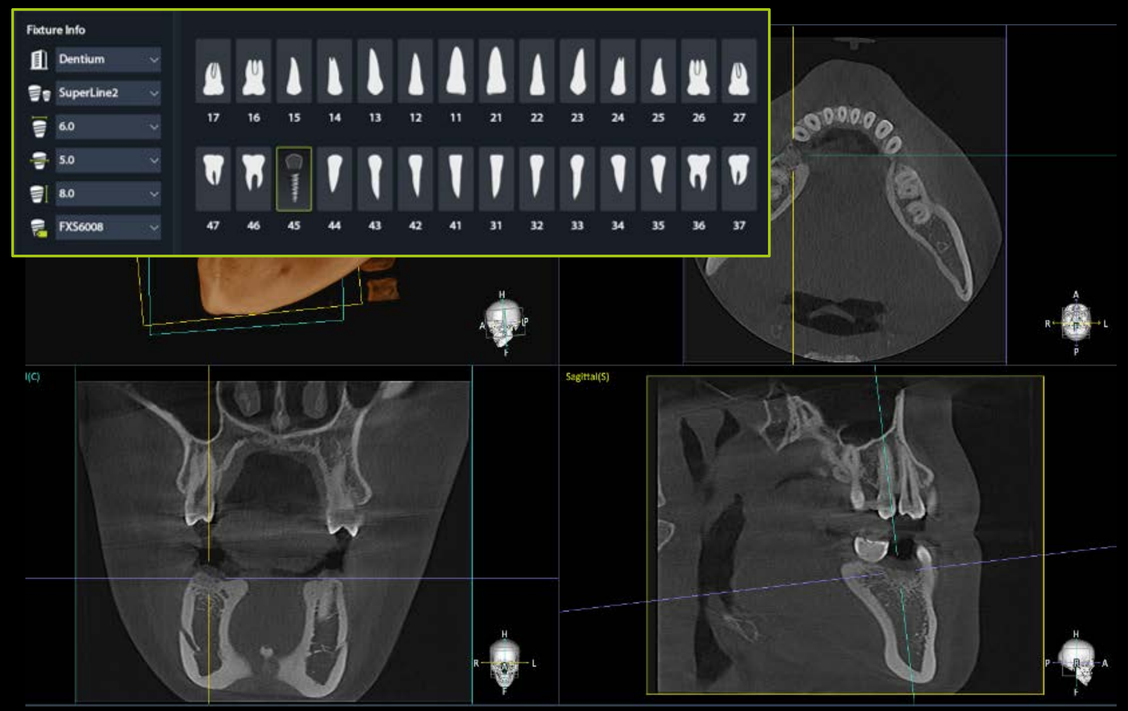


Manual

AI nerve auto detection, error < 0.42mm

3D Viewer **AI Auto Fixture Placement**

AI Auto Fixture Placement



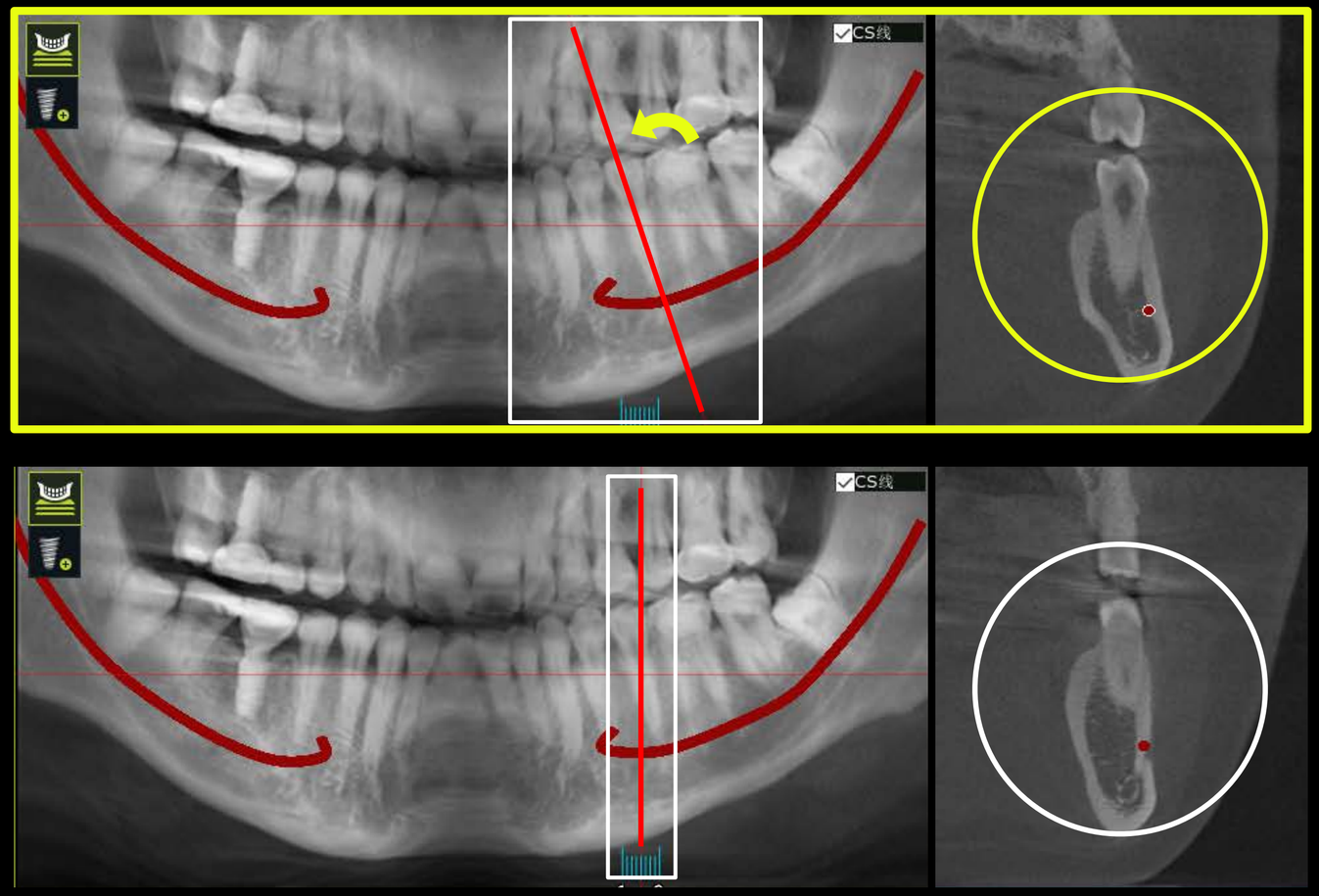
Manual

AI Fixture Initial Positioning

3D Viewer **Root Axis Viewer**

Root Axis Viewer

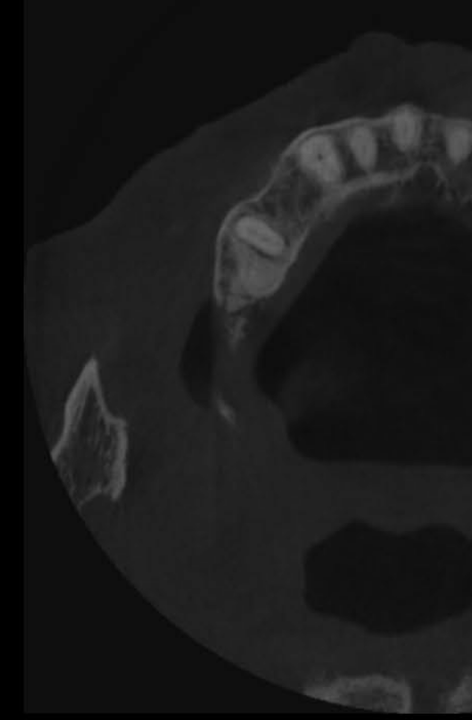
Supports cross-sectional images base on the root axis in panorama



3D Viewer **Endo View Visualization**

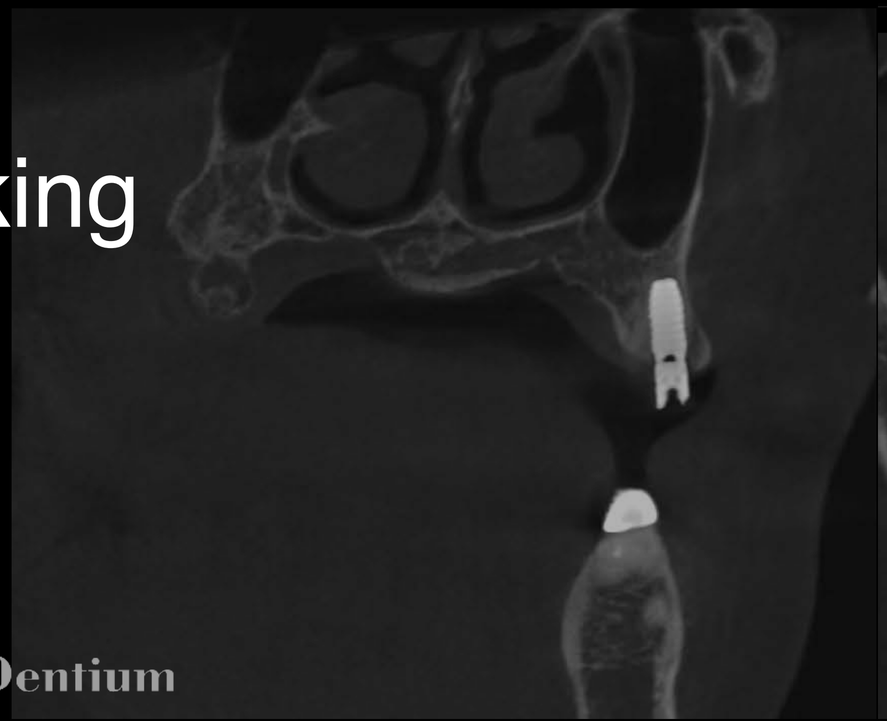
Endo View Visualization

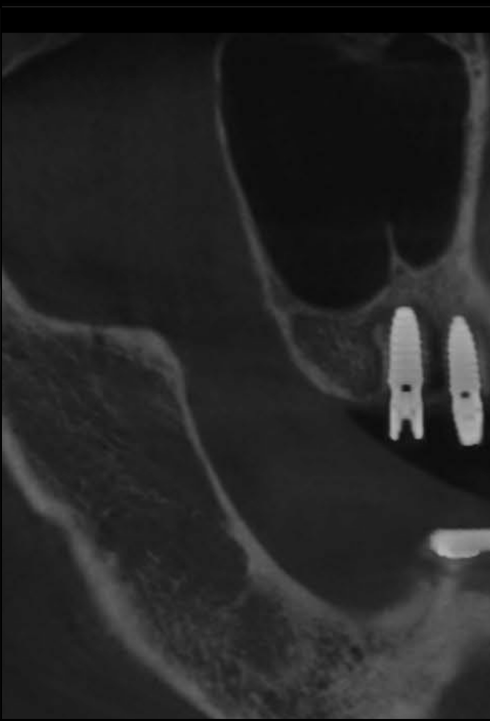
Practical digital concept



Utilization of CT data

- CT stitching for bite taking
- AI Occlusal plane





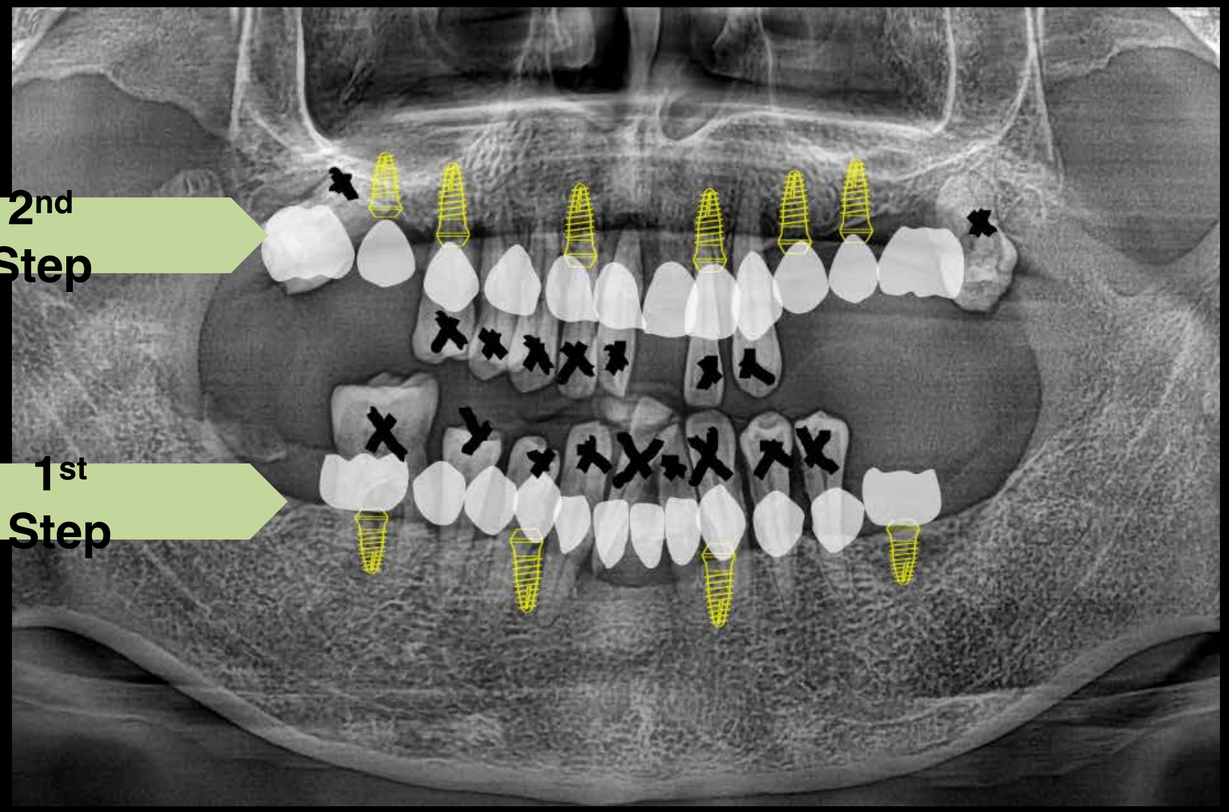
Dentium

Pre-op (2023-08-08)

PMH
Heart stent transplants,
diabetes, hyperlipidemia

Pre-op (2023-08-10)

Surgery plane with X-ray



1st Step

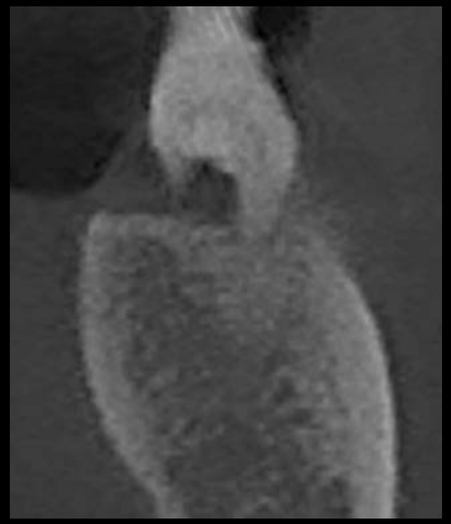
Full mouth extraction

All on 4 immediate implantation on **Lower** arch

2nd Step

All on 6 implantation on **upper** arch

Pre-op CT (2023-08-10)



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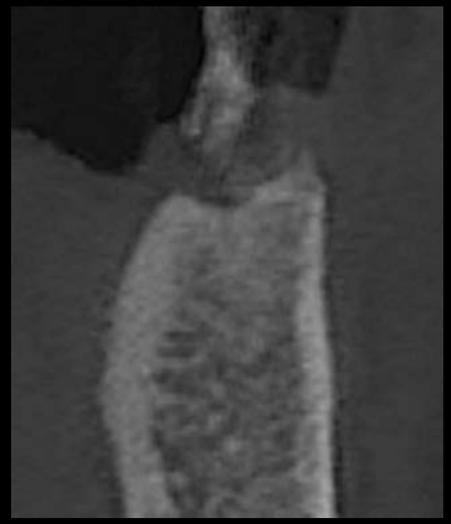

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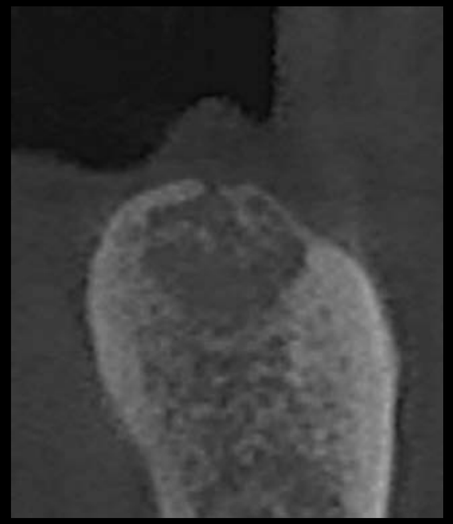

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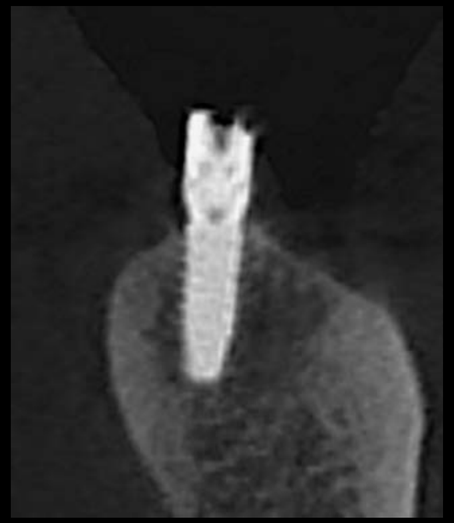
Post-op CT (2023-08-10)



#46

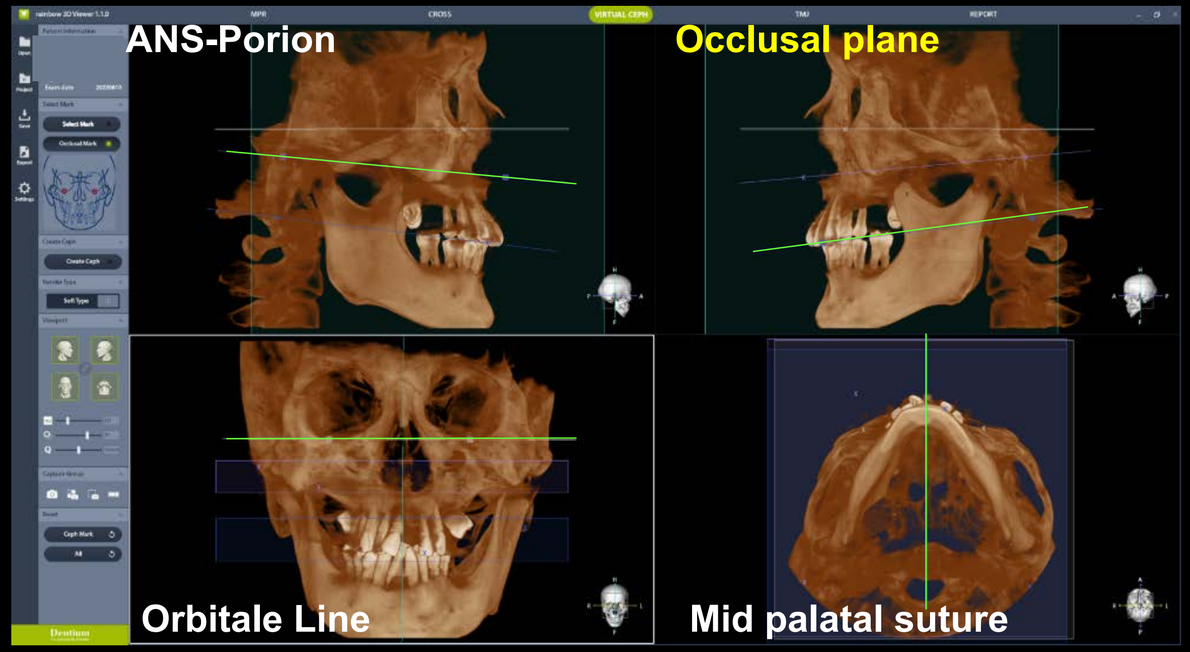
#33

#43

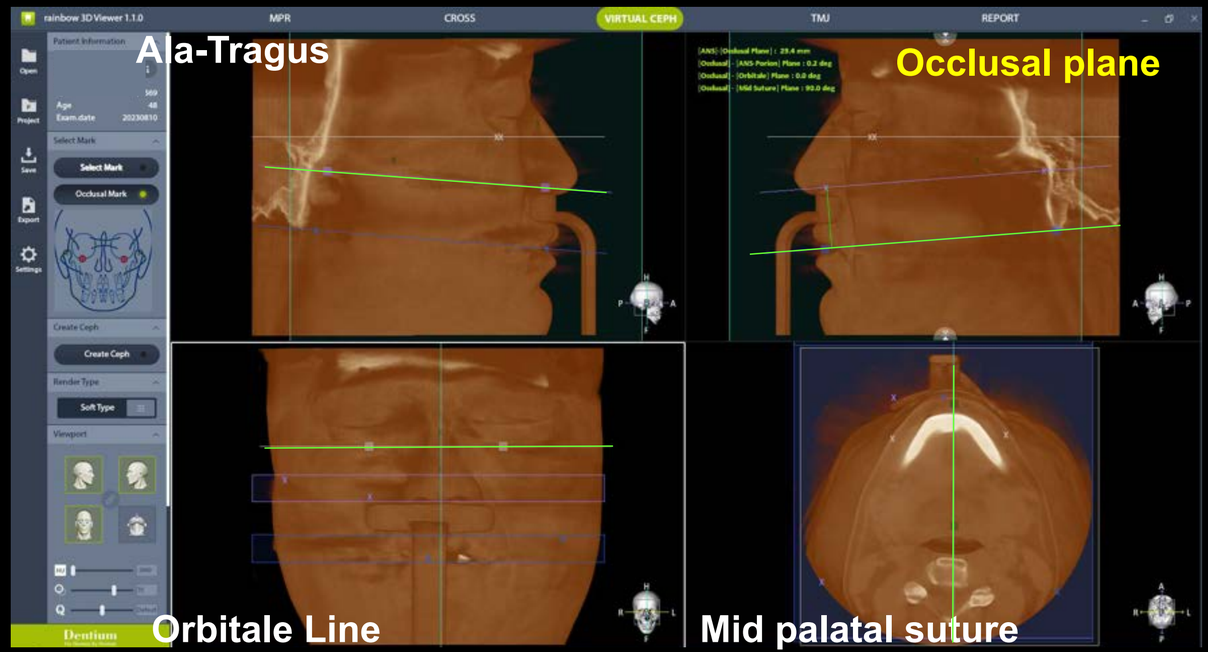
#46

CT viewer 활용 평면 설정

Hard tissue

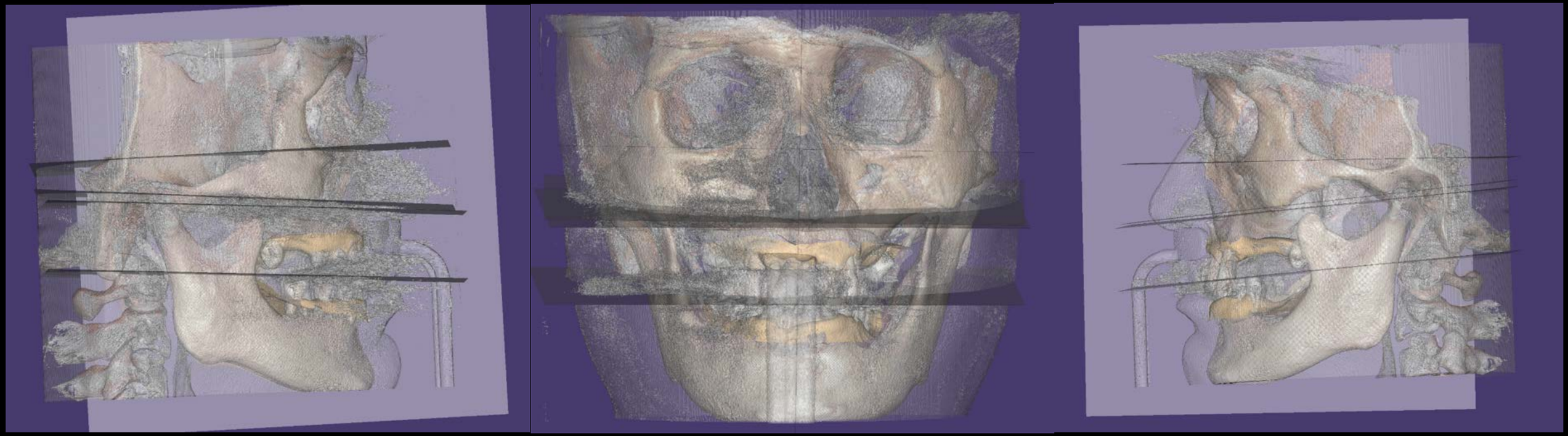


Soft tissue



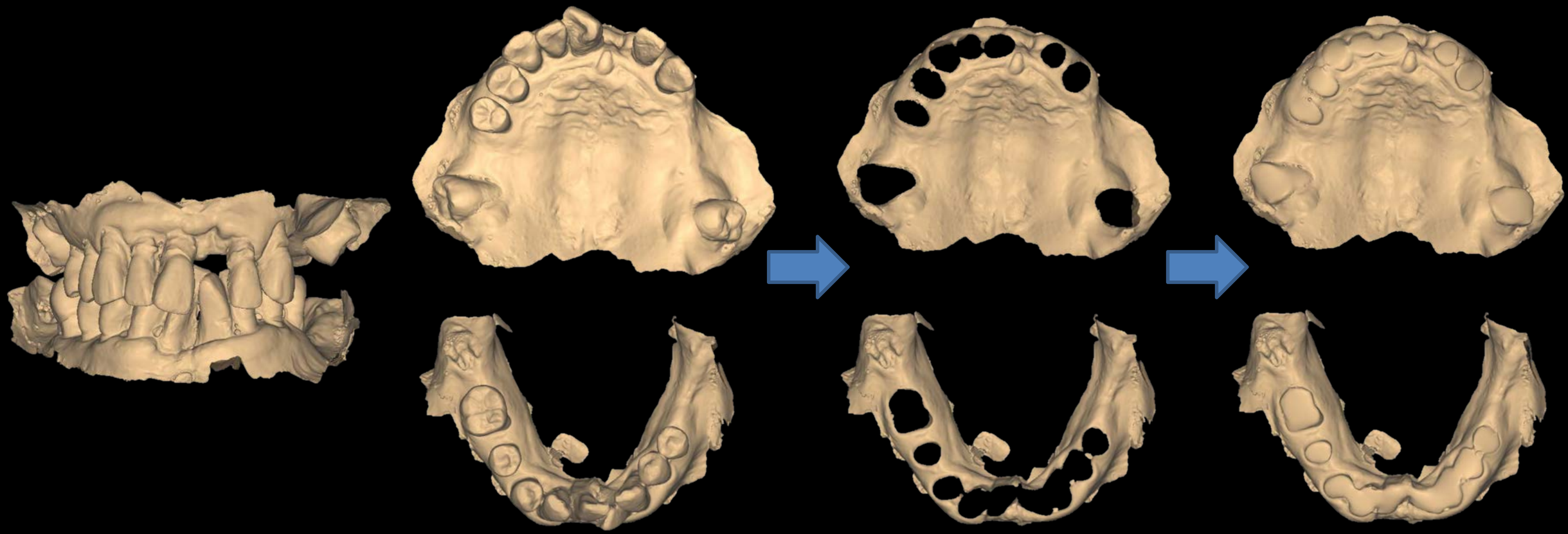
HU값 조절을 통해 Hard/ Soft tissue 모두 pointing 가능

Data stitching
(CT DICOM + CT plane STL + working model)

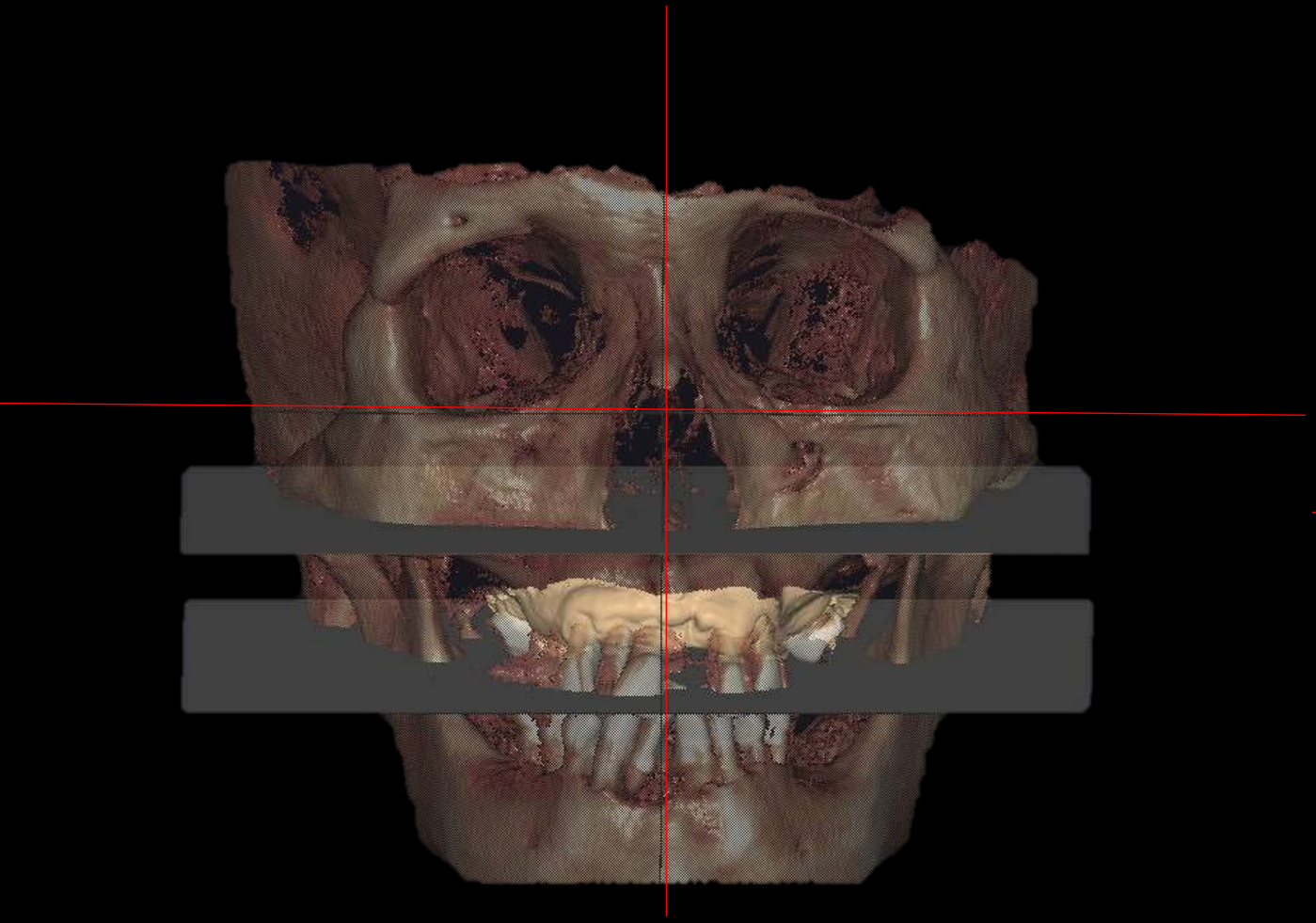


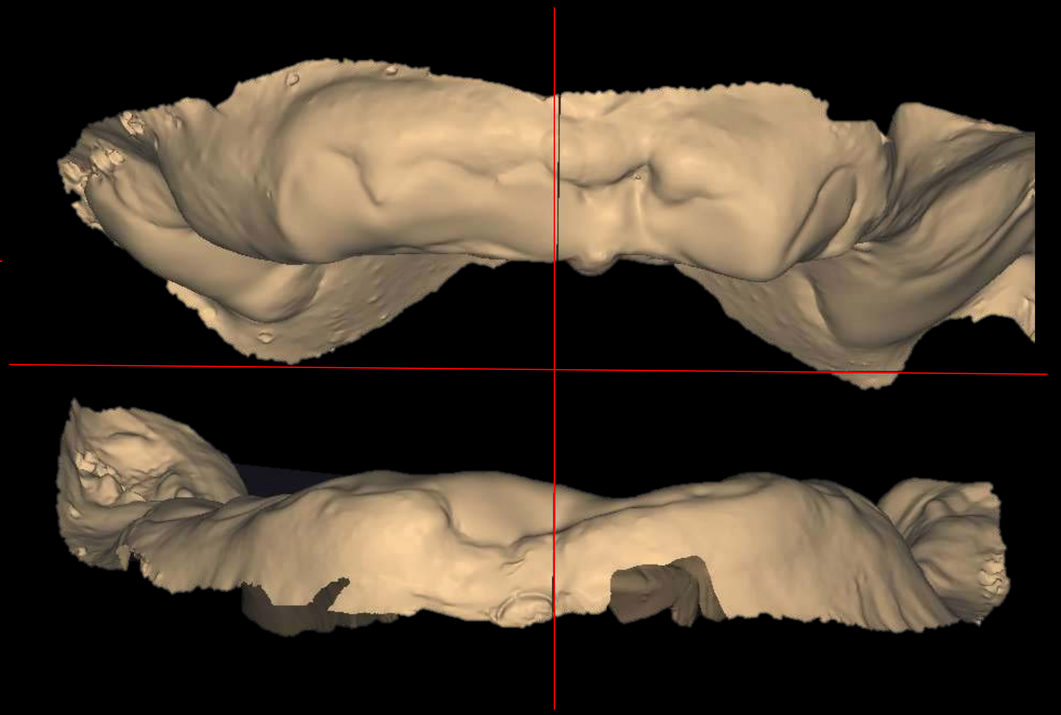
CT STL (soft / hard) + plane STL + IOS

Working model
(Intra Oral Scan data editing)

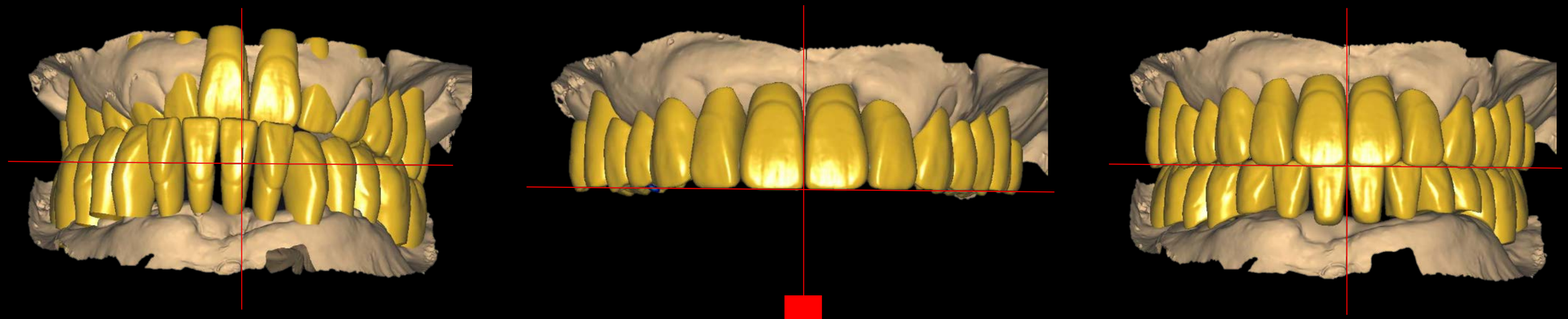


Data stitching
(CT DICOM + CT plane STL + working model)

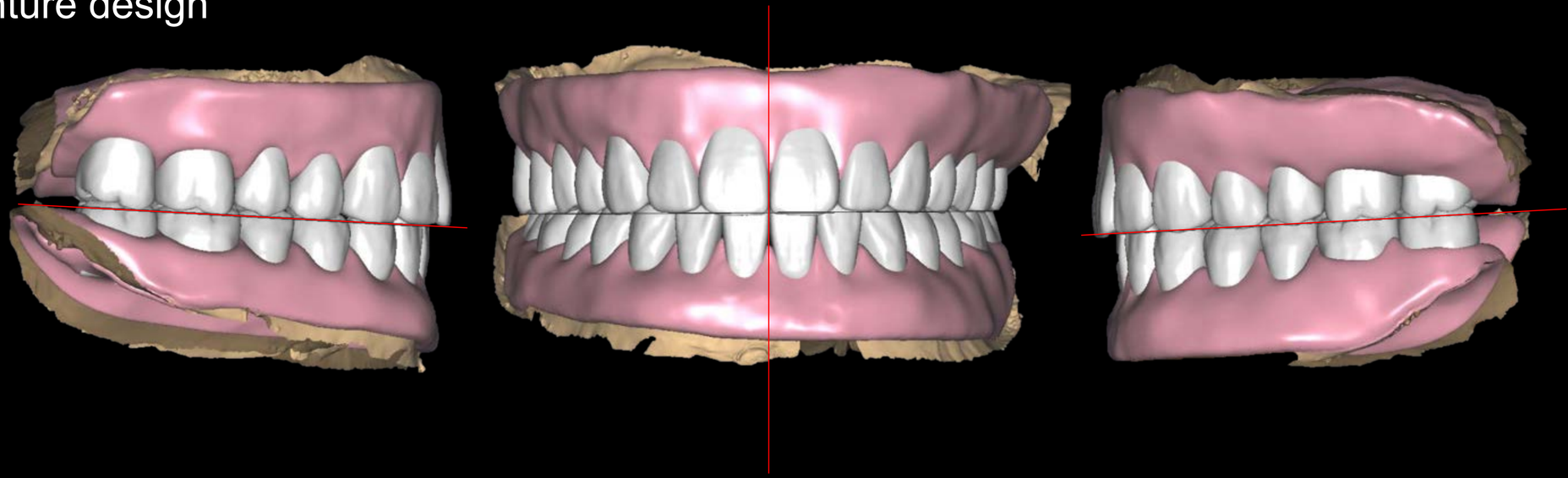




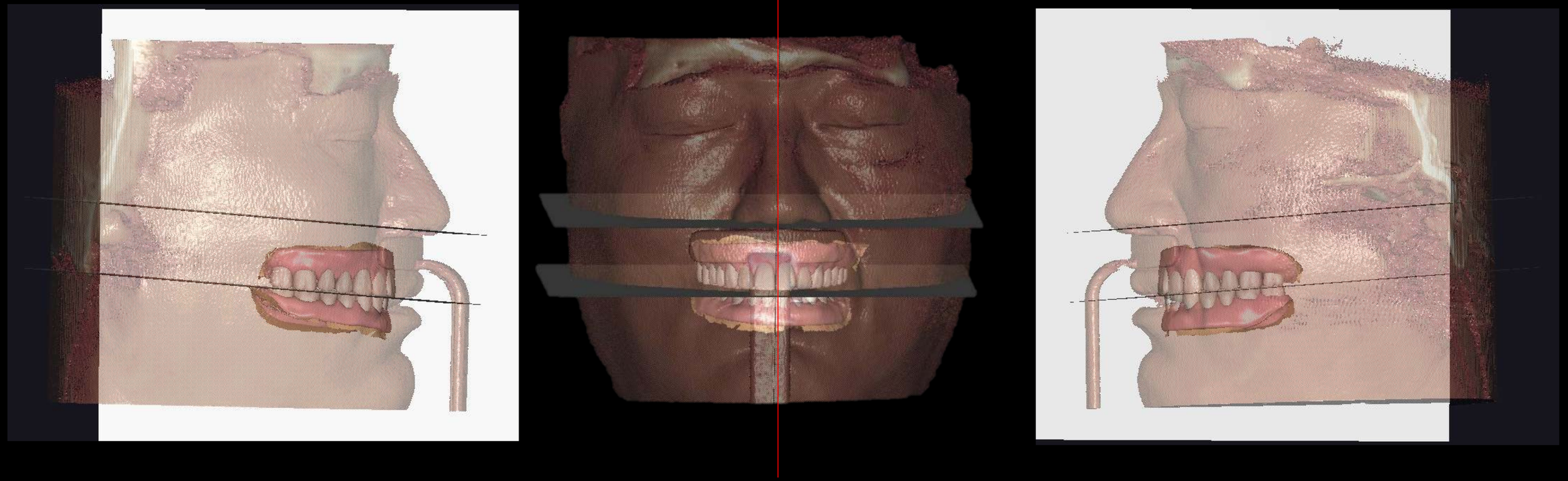
Virtual Set-up



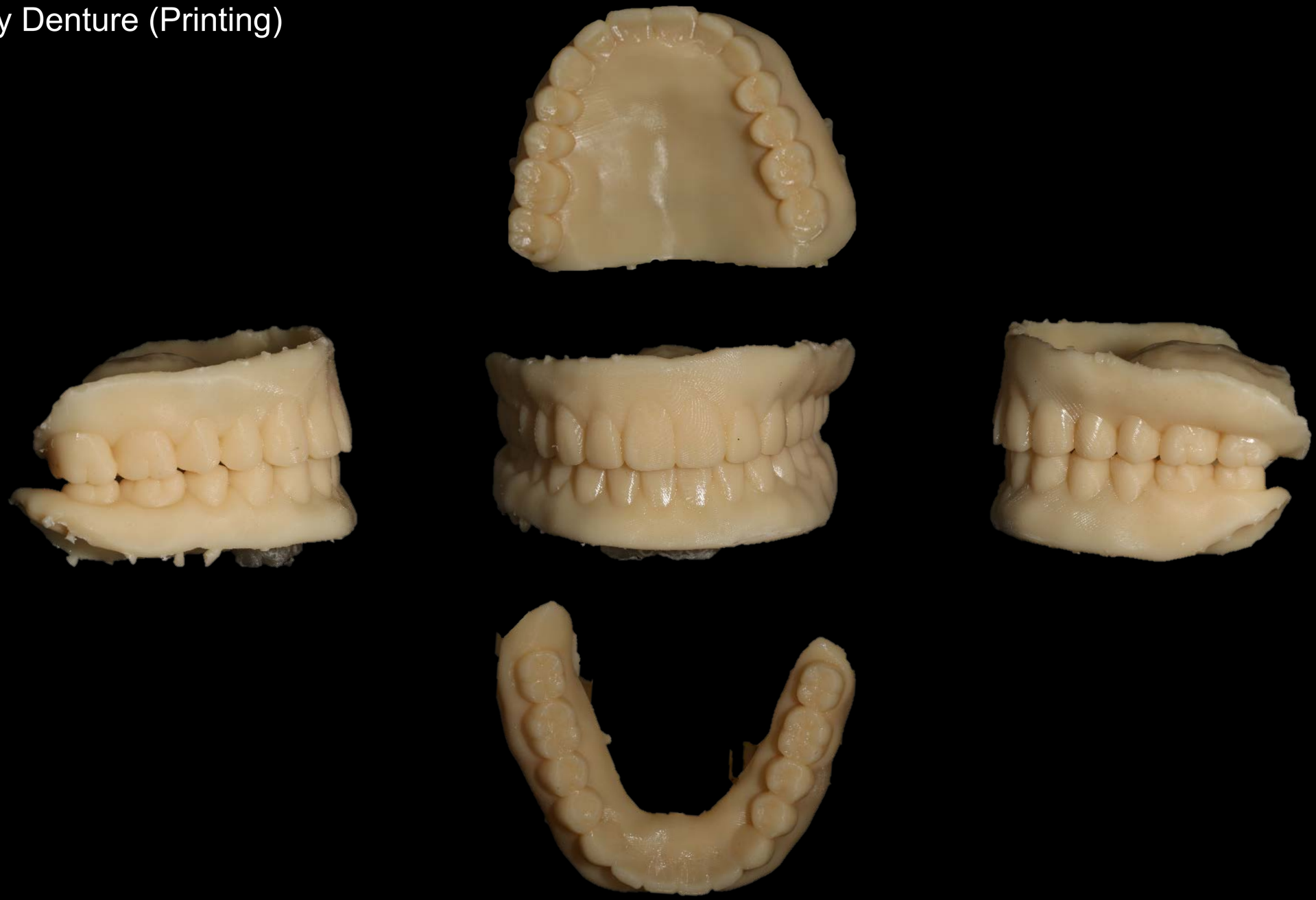
Temporary denture design



Temp denture design

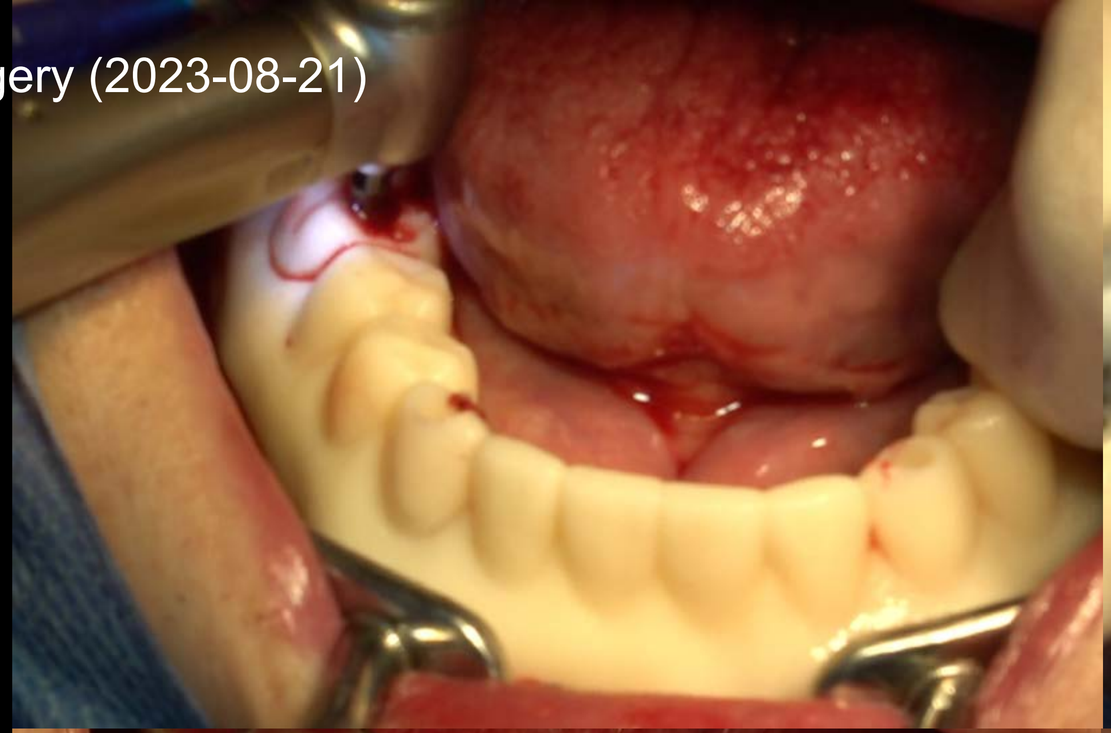


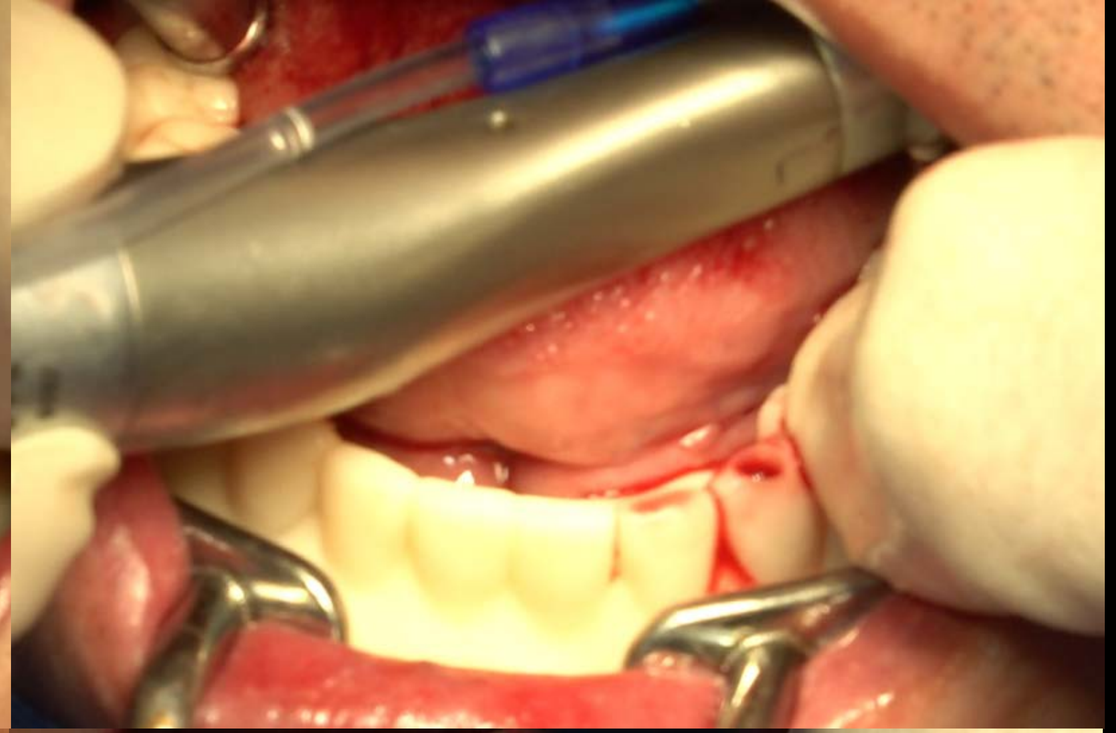
Temporary Denture (Printing)

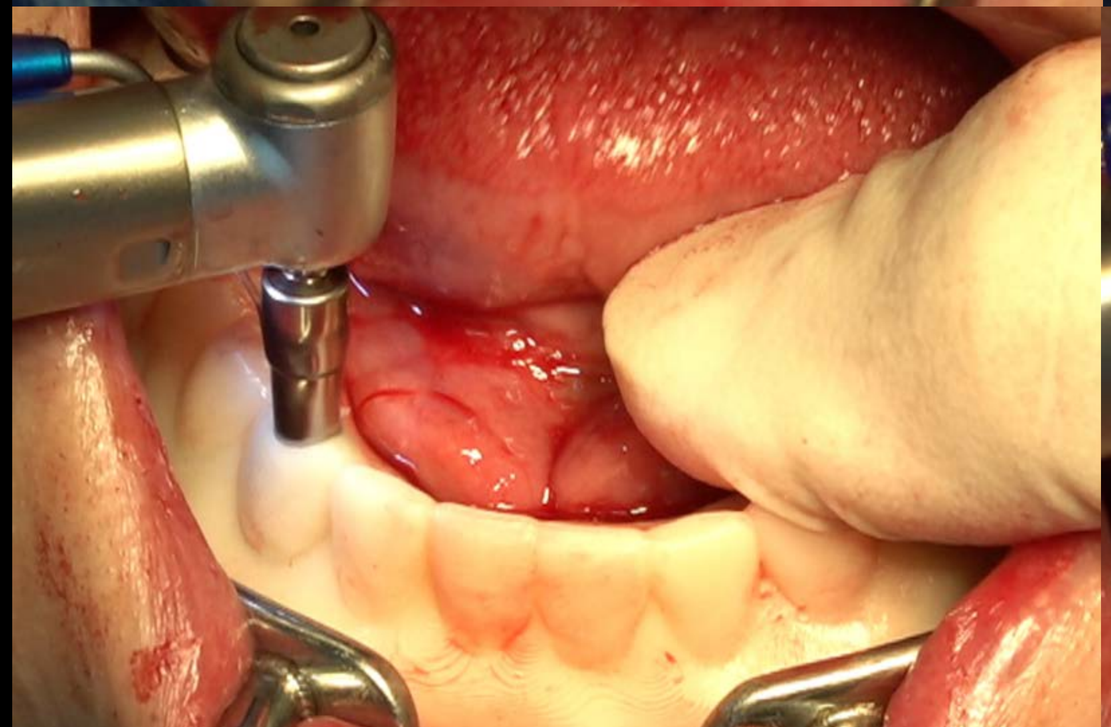


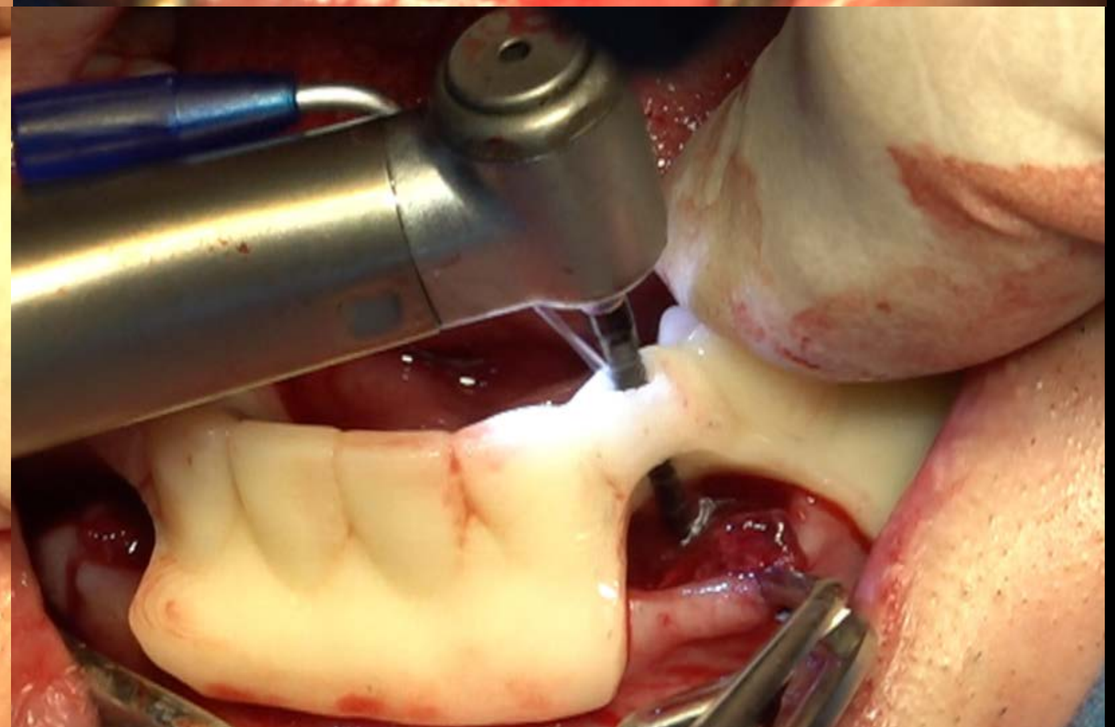
Marking hole on Lower printing denture

Surgery (2023-08-21)

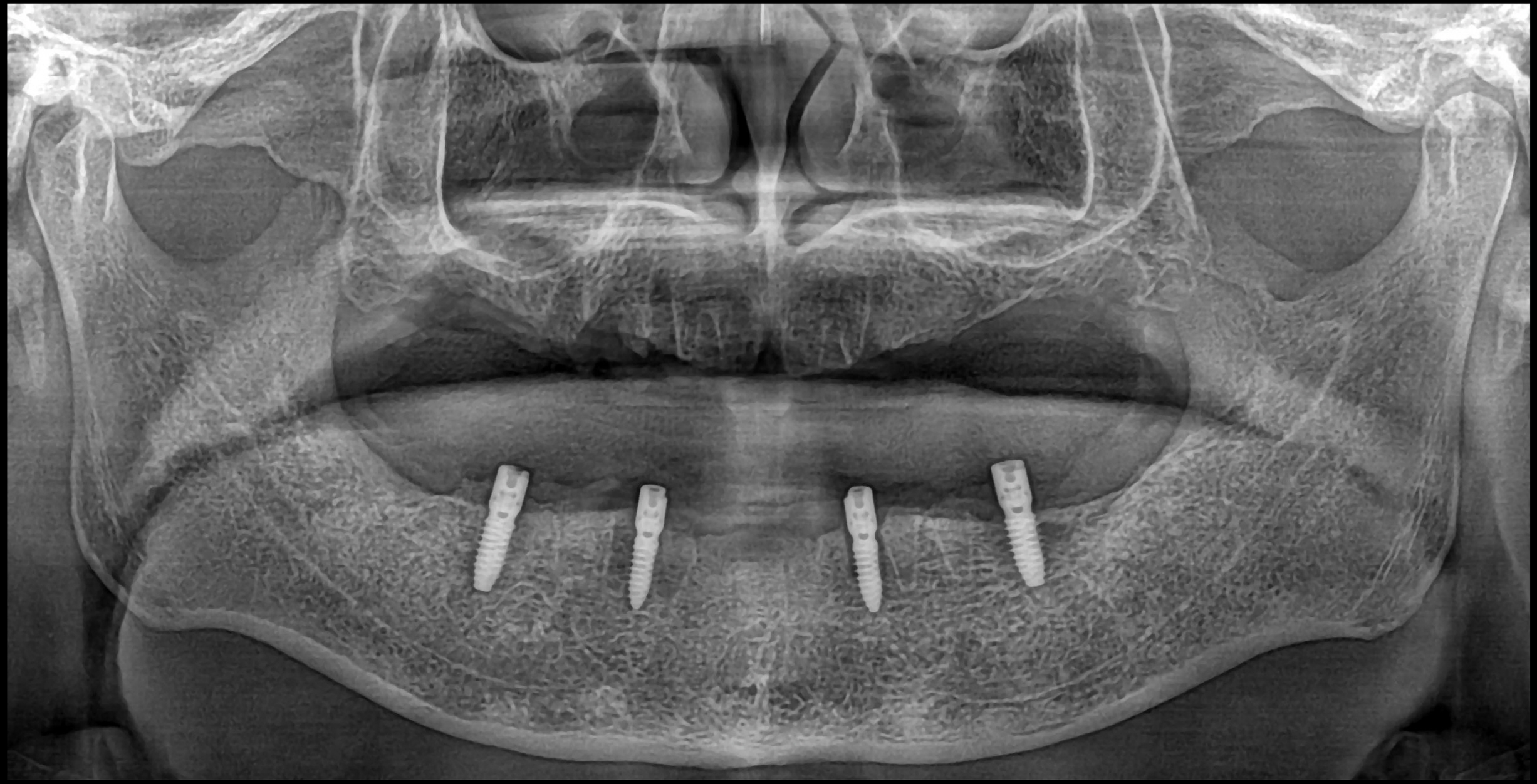


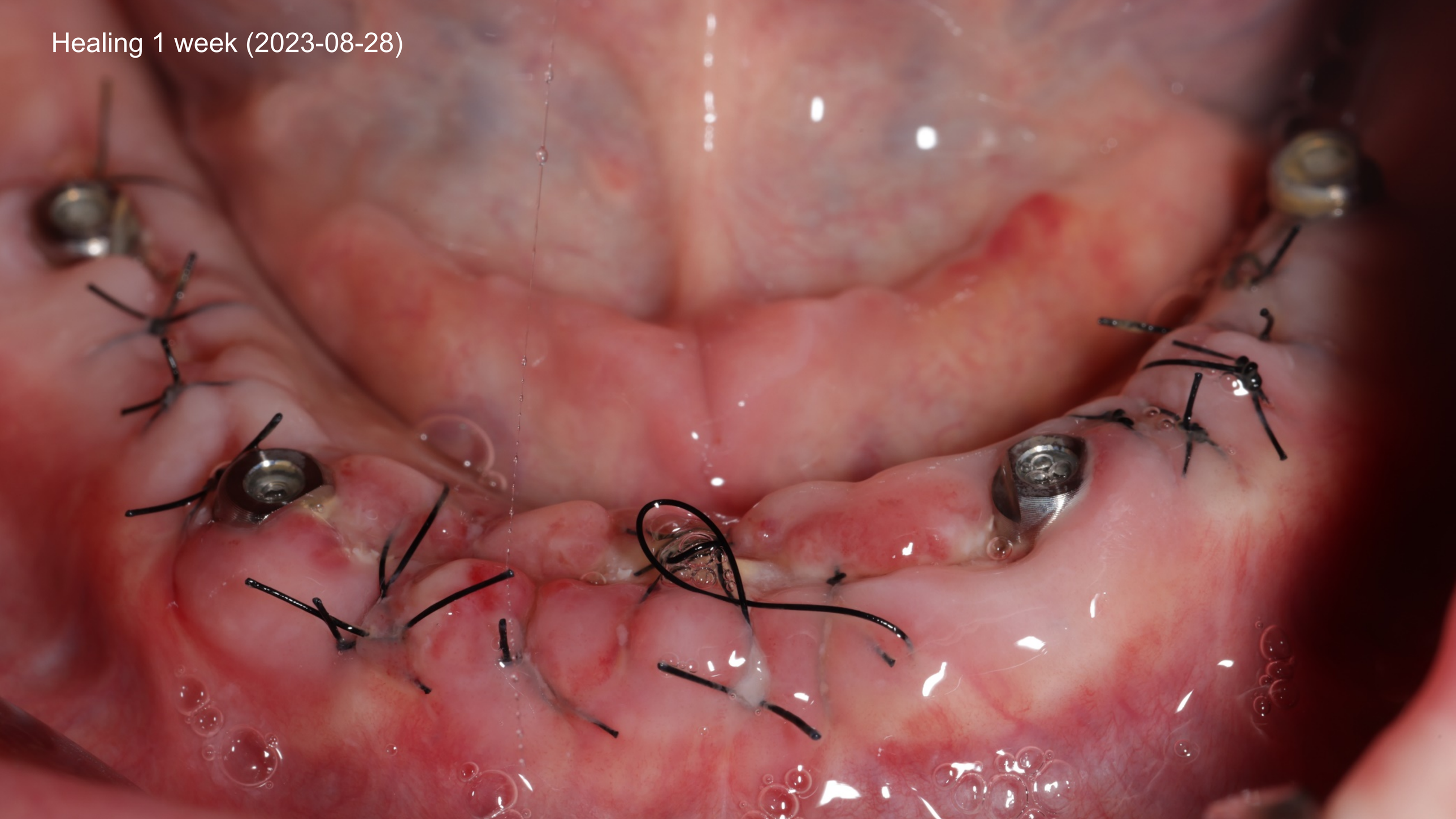






Post-op (2023-08-21)

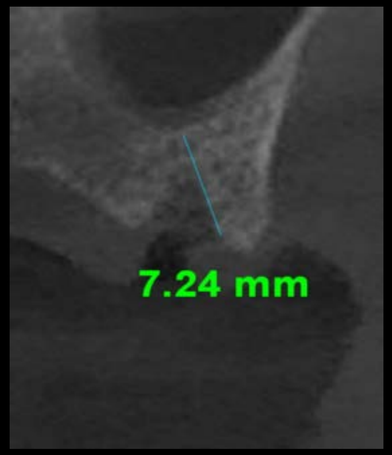



Healing 1 week (2023-08-28)

Pre-op (2023-08-28)
Healing 1 week after extraction

Marking hole on upper printing denture

Pre-op CT (2023-08-21)



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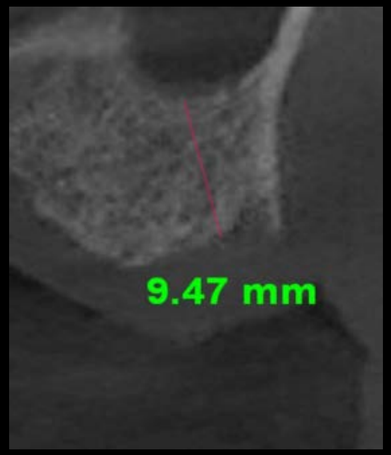

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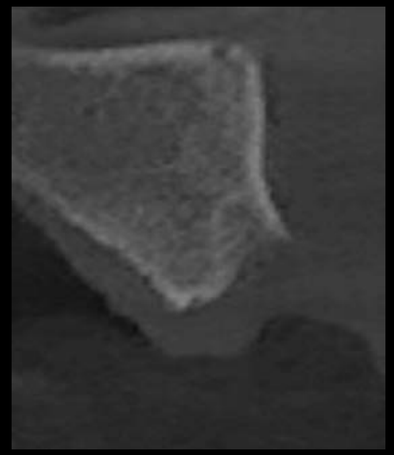

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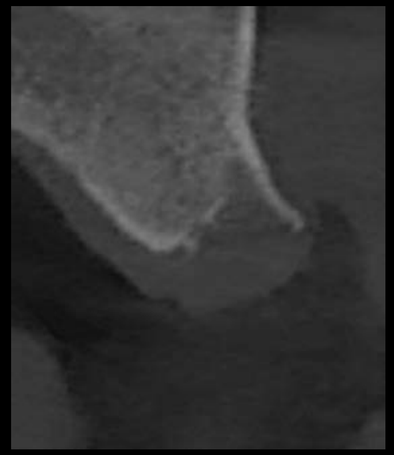

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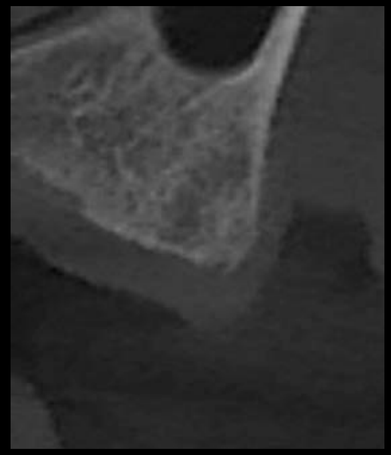

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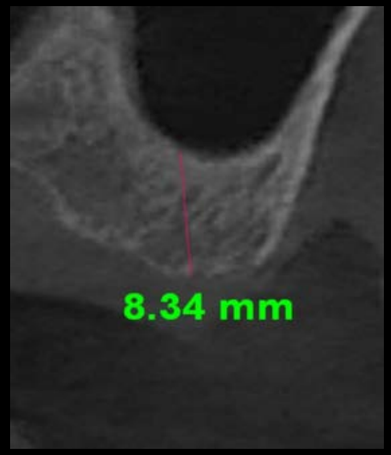


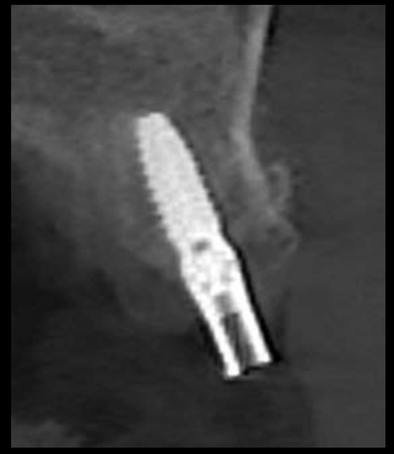
#25

Post-op CT (2023-08-28)

#15

#14

#12

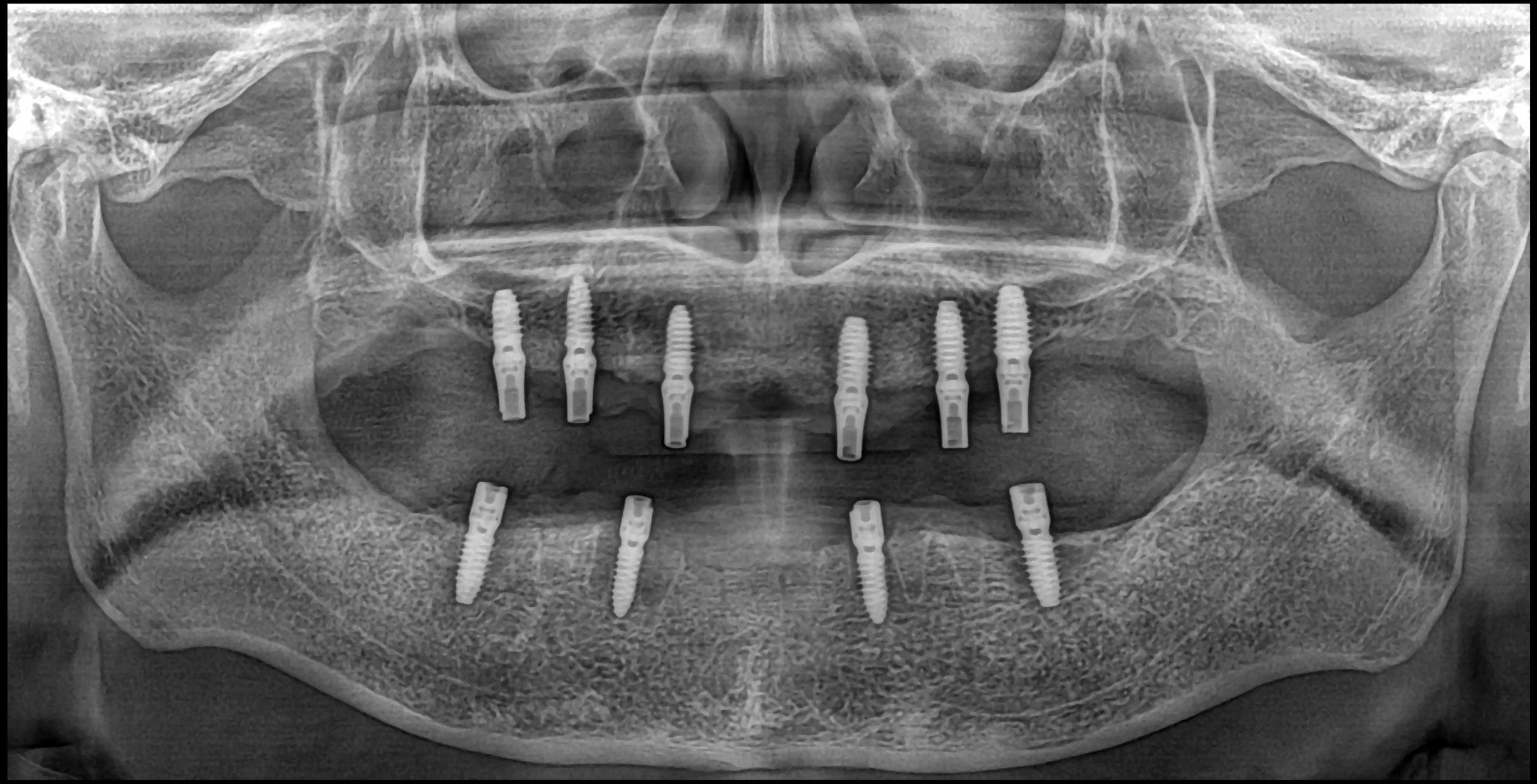


#22

#24

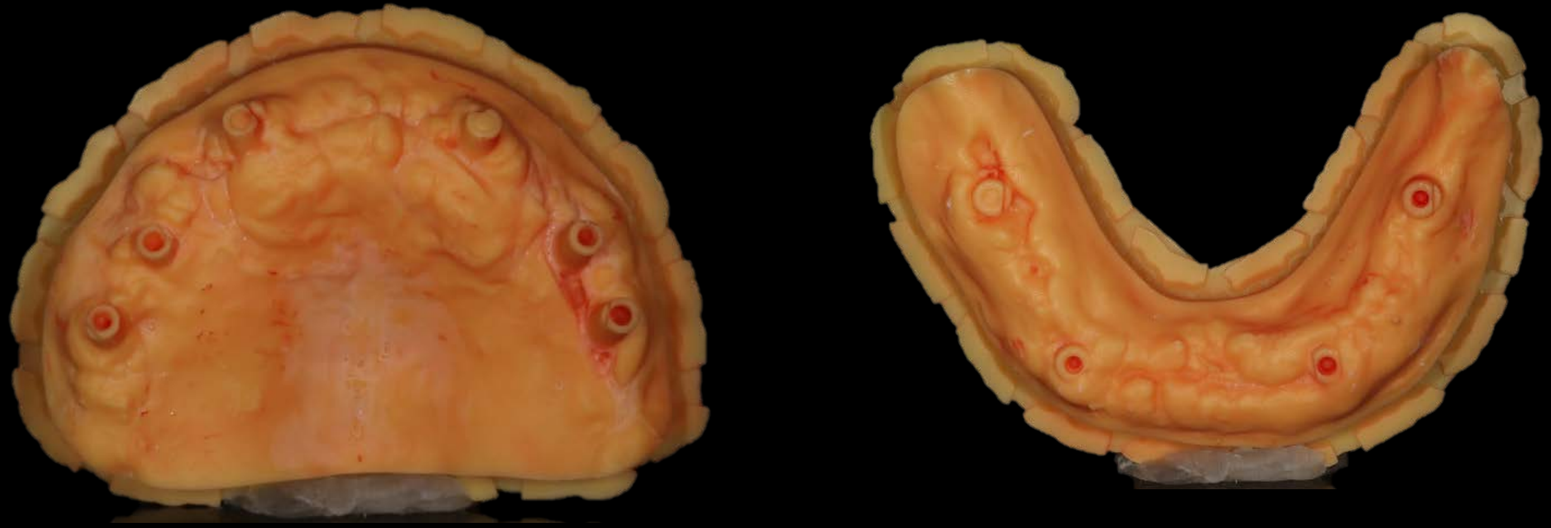
#25

Post-op (2023-08-28)

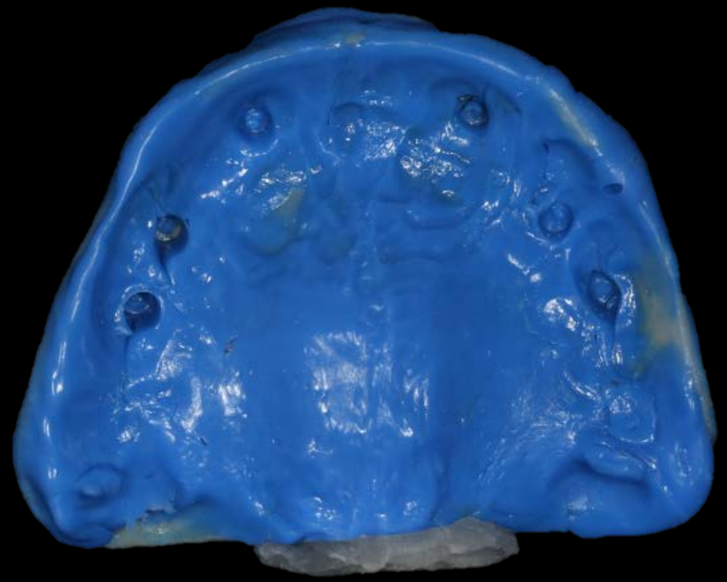


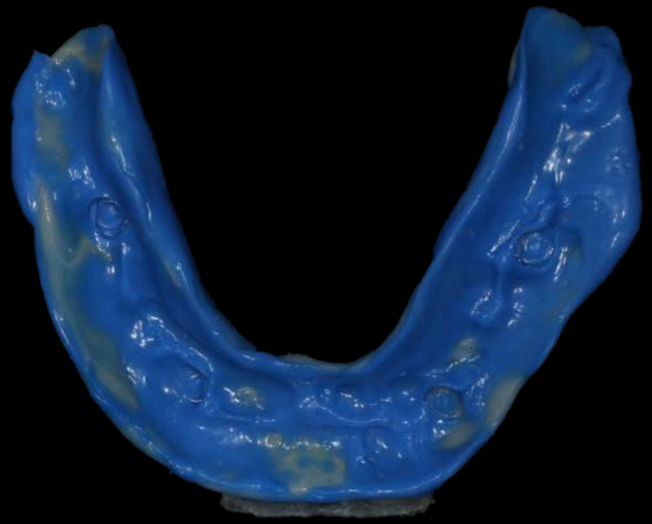
IOS for printing model

Printing model for Temporary denture relining

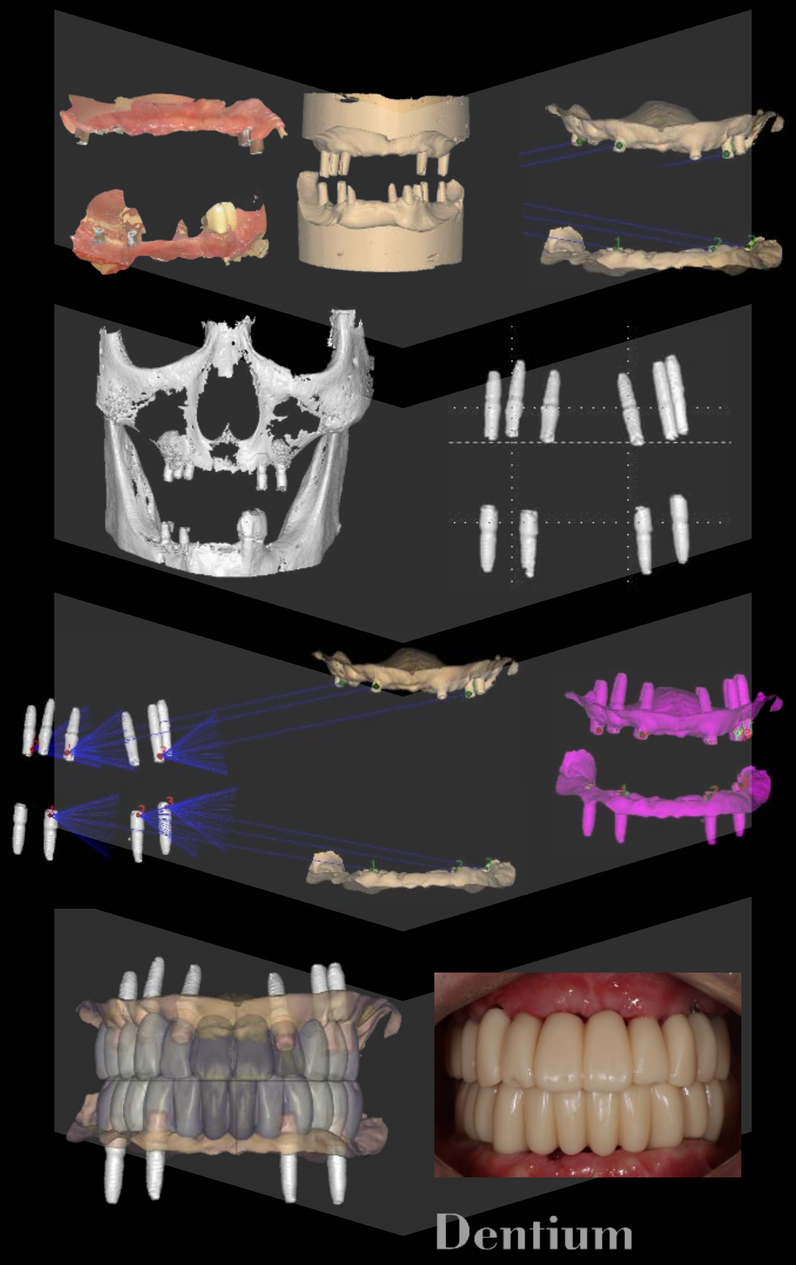


Denture duplication for Provisional prosthesis





CT stitching for bite taking Process



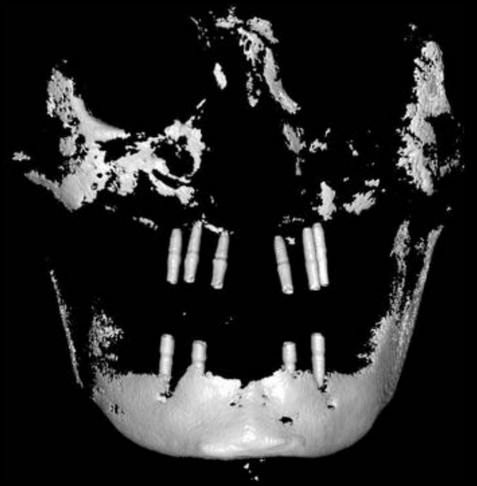
1) Impression taking
(IOS, model scan, impression scan etc.)

2) CT DICOM → STL export & editing

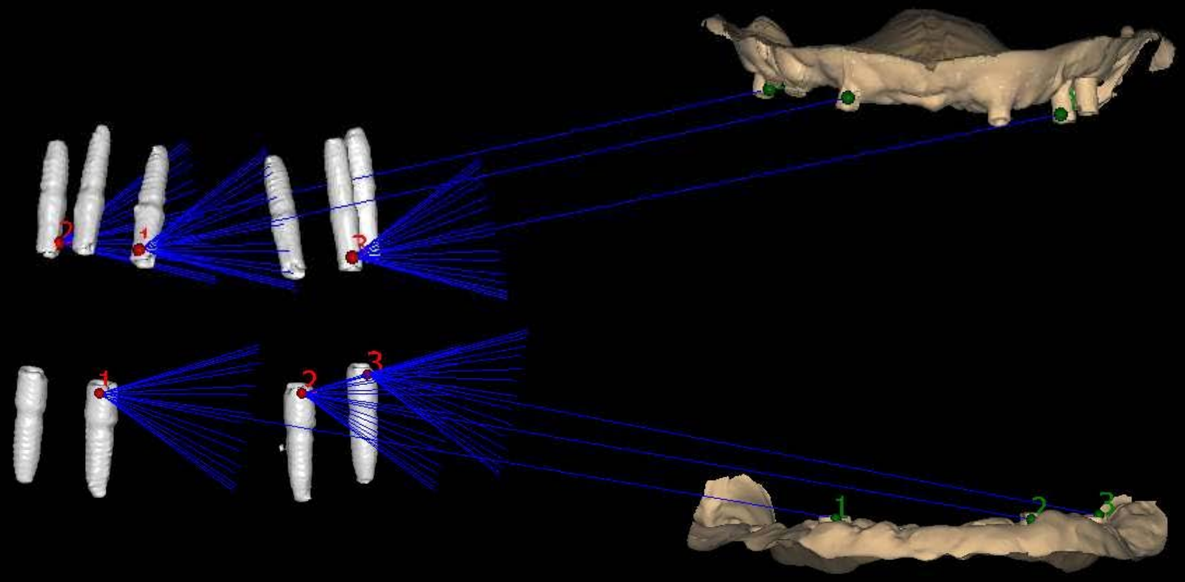
3) CT STL + Impression data stitching

4) Dental CAD design & prosthesis delivery

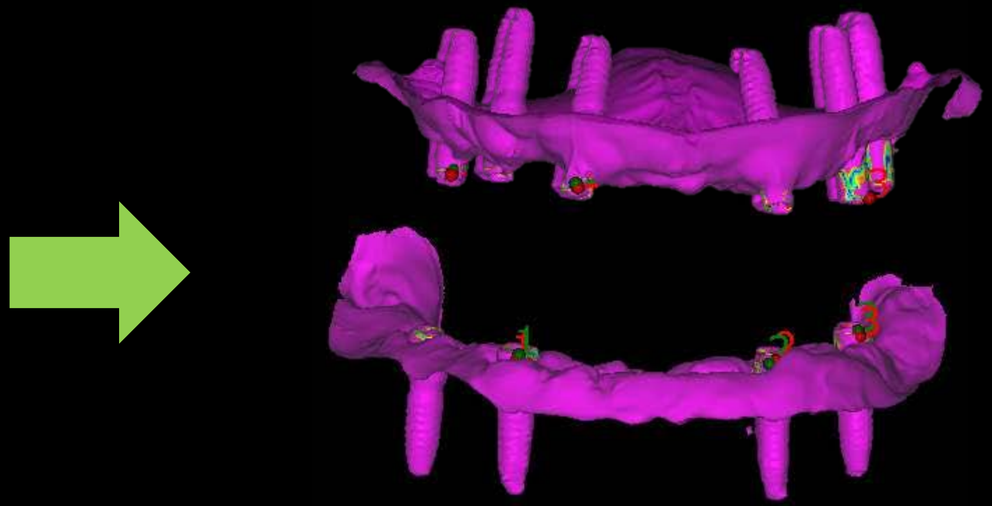
CT stitching

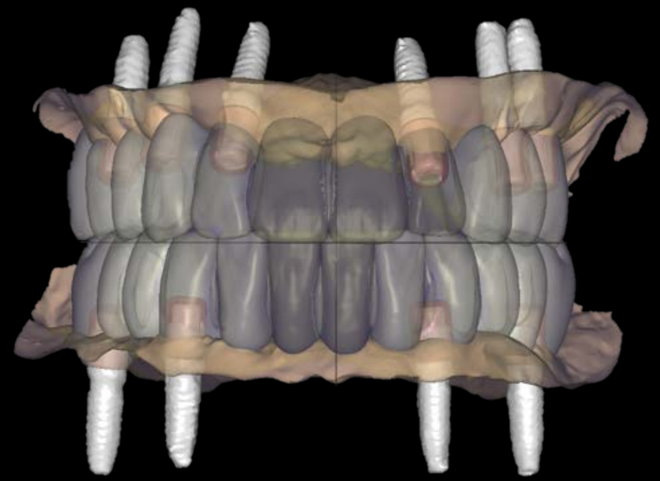


CT STL export & editing



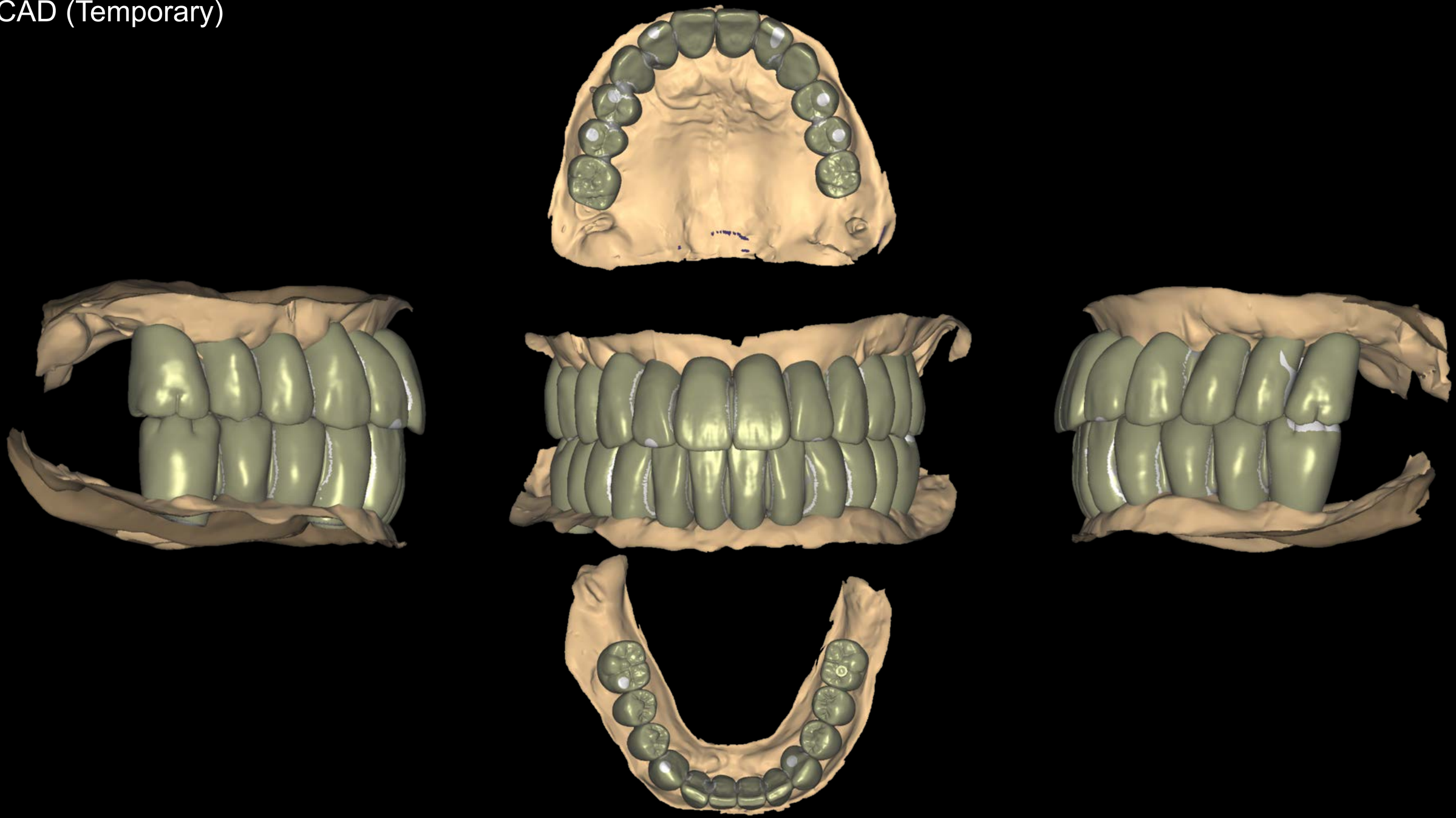
CT STL & working model stitching

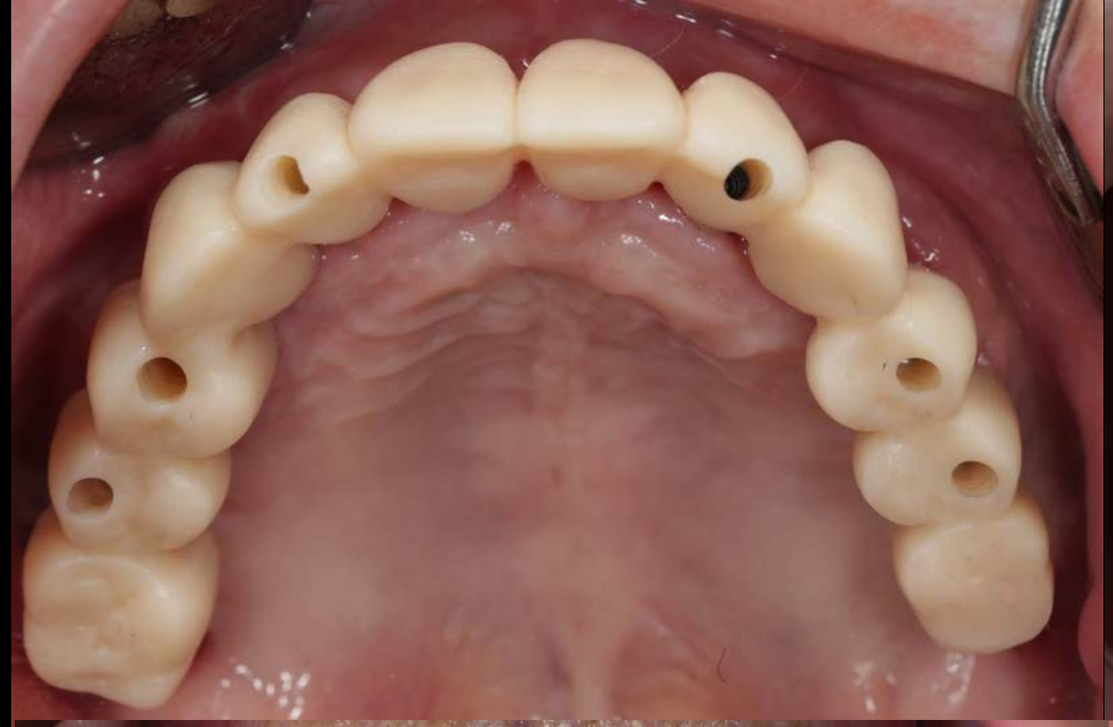




Crown design

CAD (Temporary)

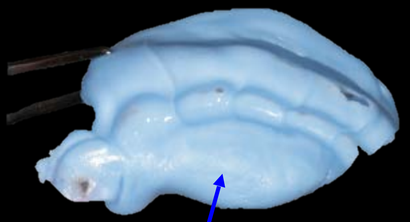


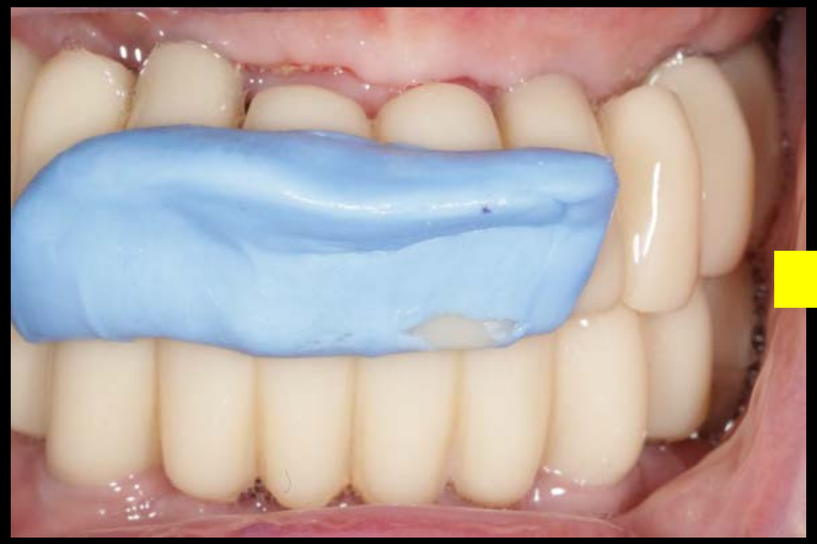


Final impression process with Digital

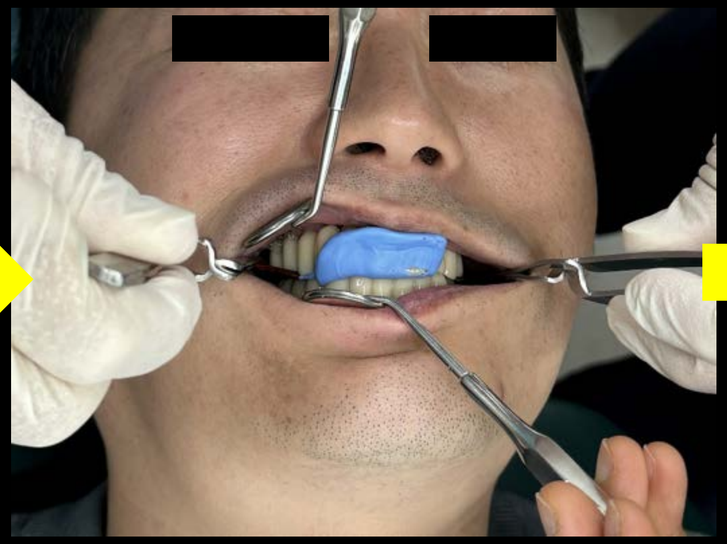
1) CT taking with putty index

Purpose of fixing the precise occlusal state

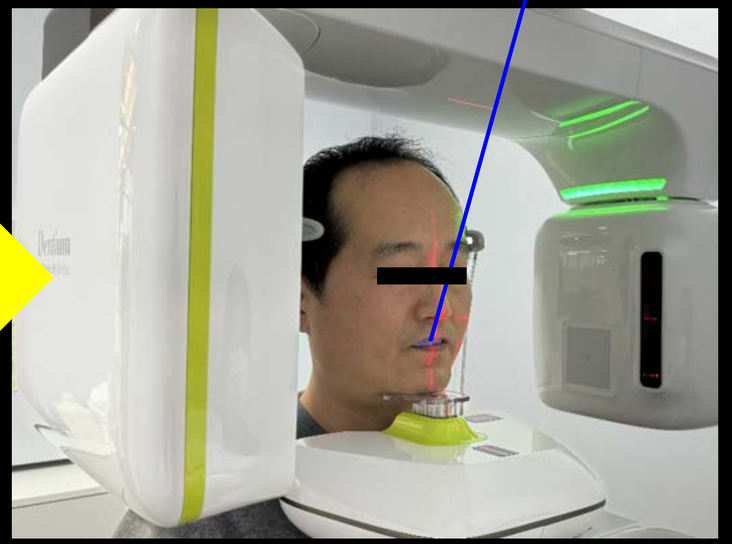




Putty index



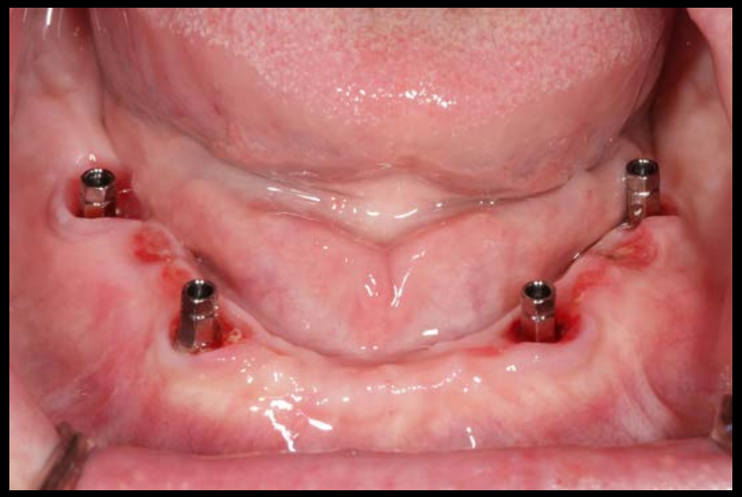
Bite checking



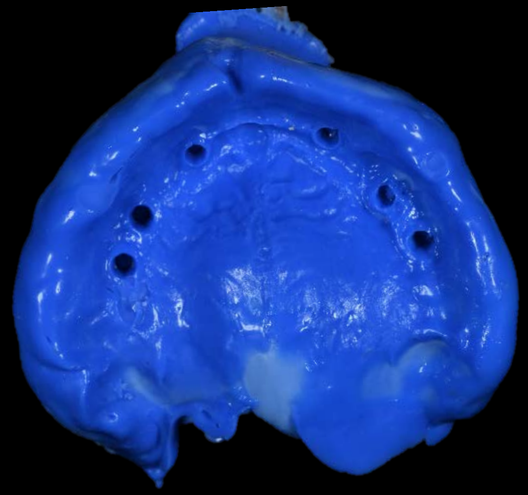
CT taking

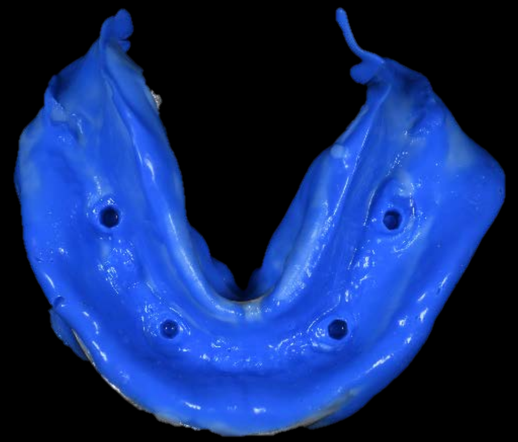
Final impression process with Digital

2) 2 Step impression



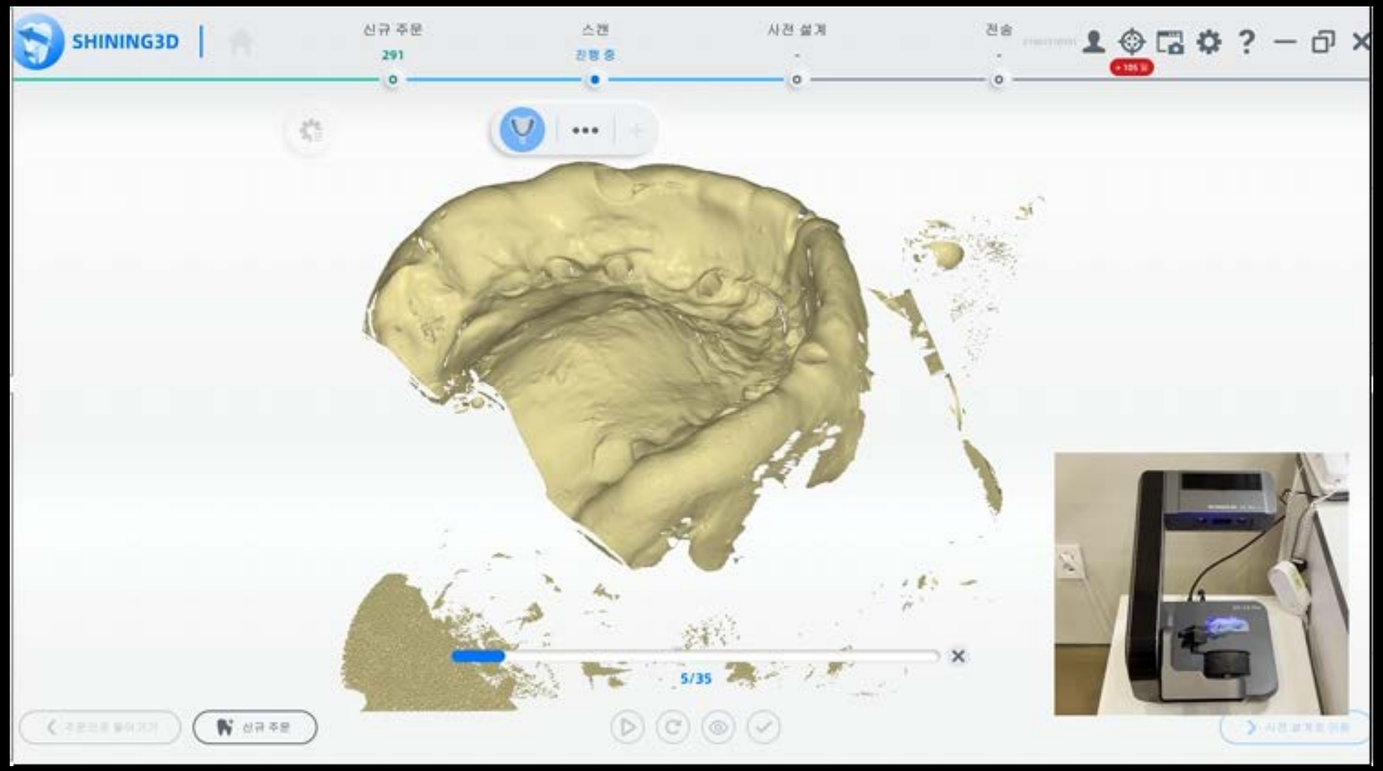
1 step : putty impression
2 step : regular body impression



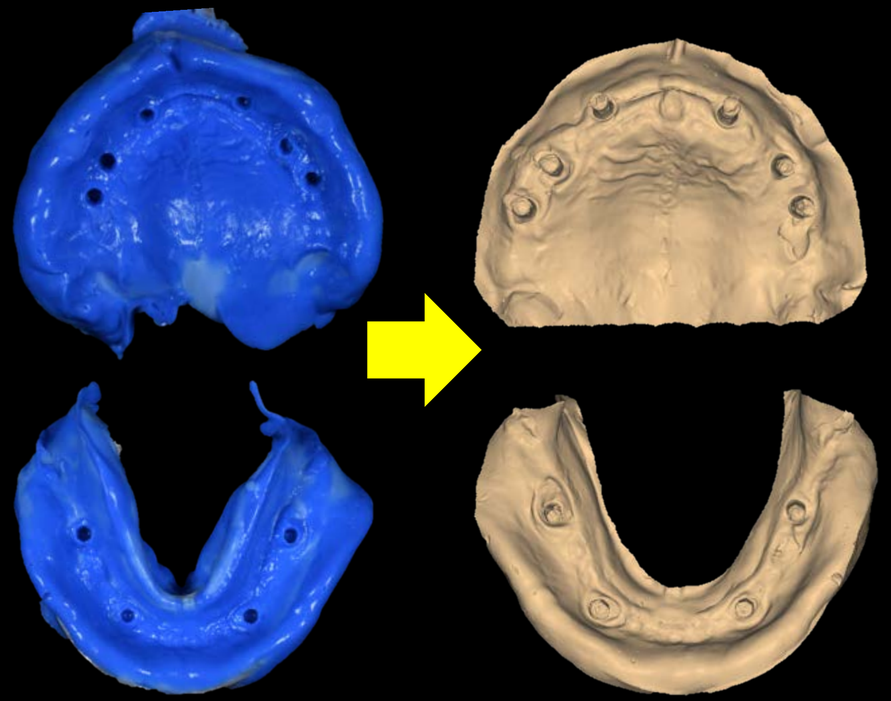


Final impression process with Digital

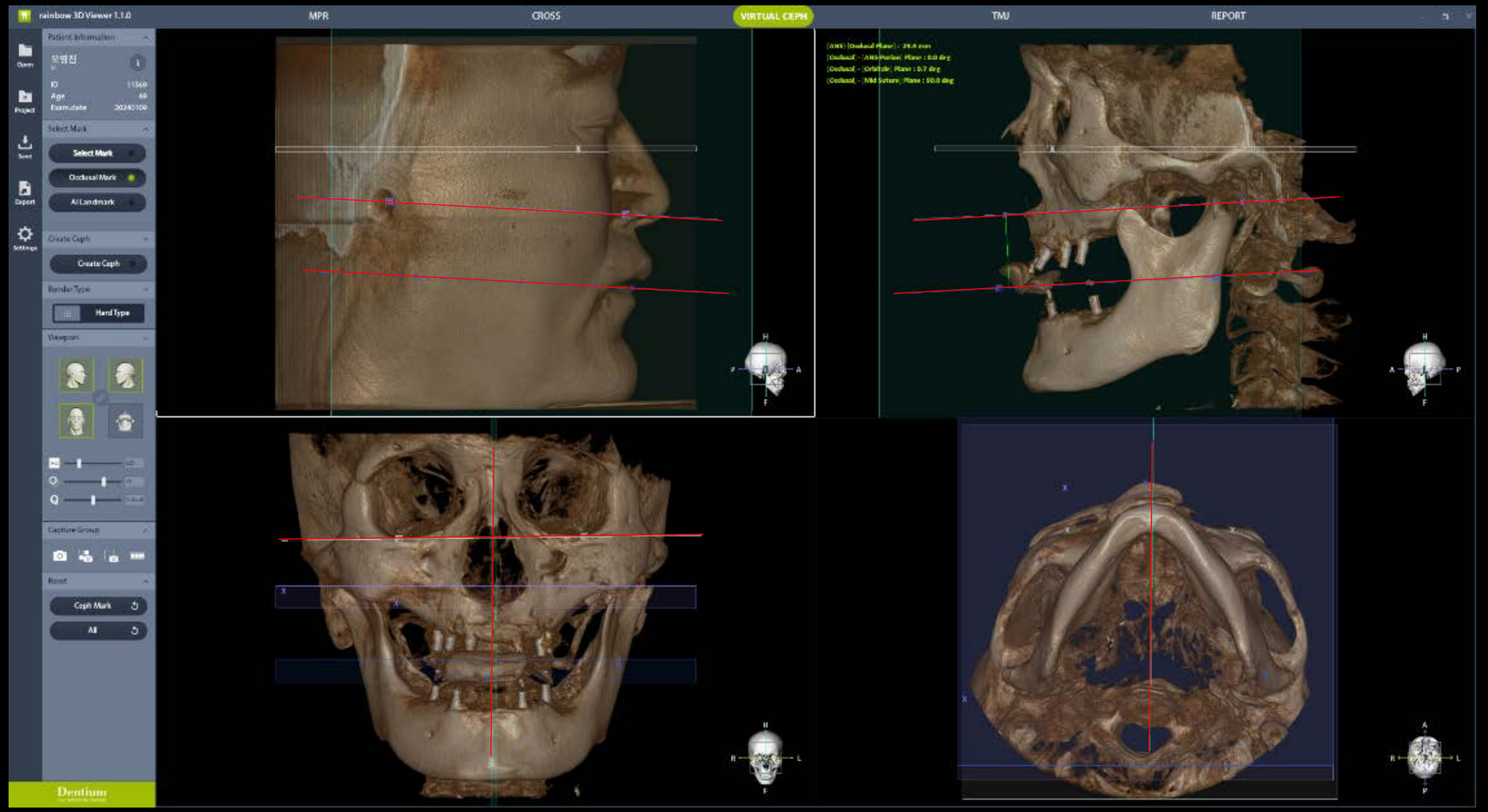
3) Impression scan without model



Impression scan with model scanner



4) Rainbow 3D viewer : CT data 활용

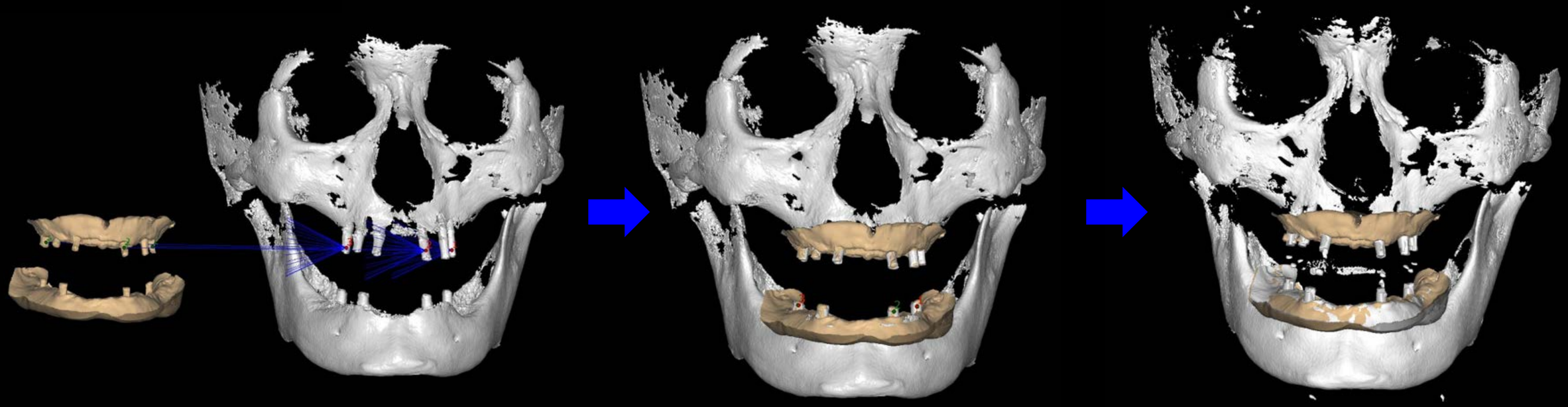


AI Occlusal plane

4) Rainbow 3D viewer : CT data 활용

CT STL export

5) Dental CAD : data stitching for Digital mounting



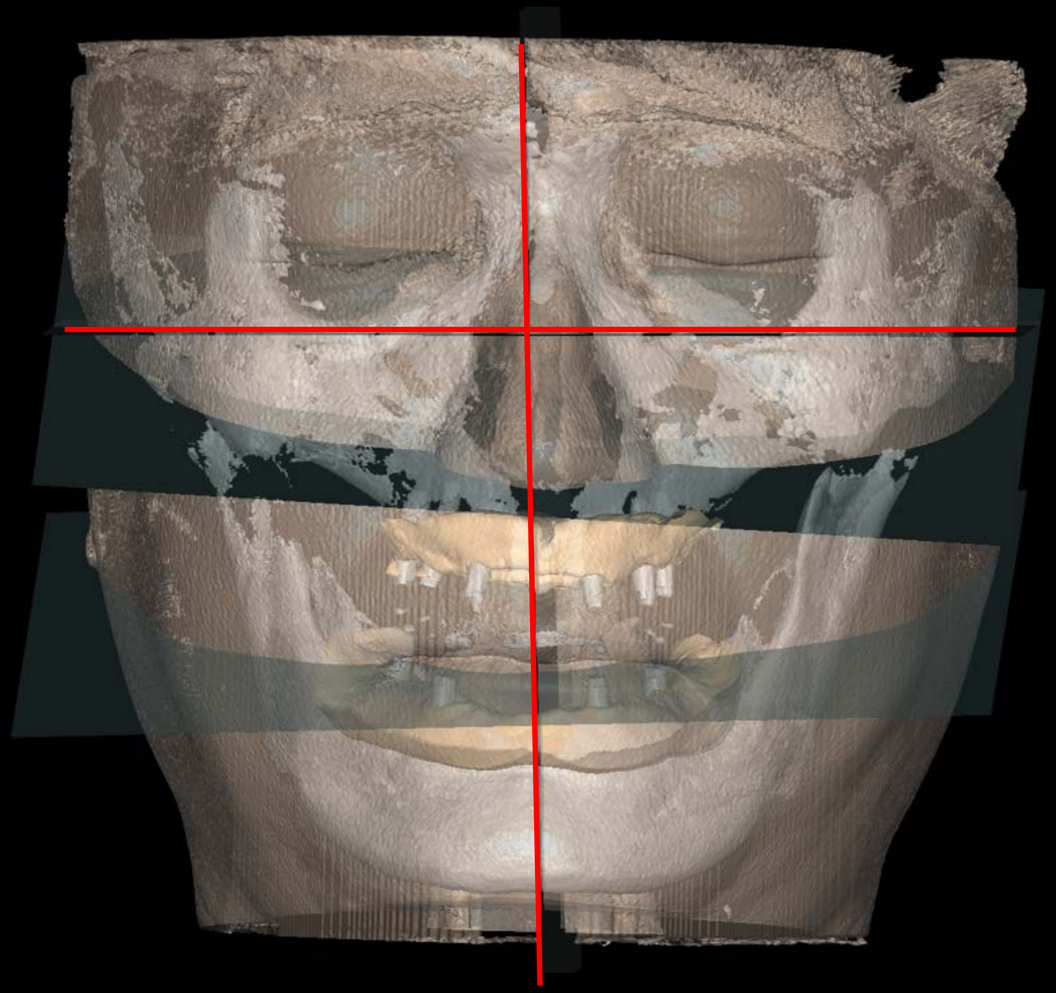
CT STL (Hard tissue) + working model

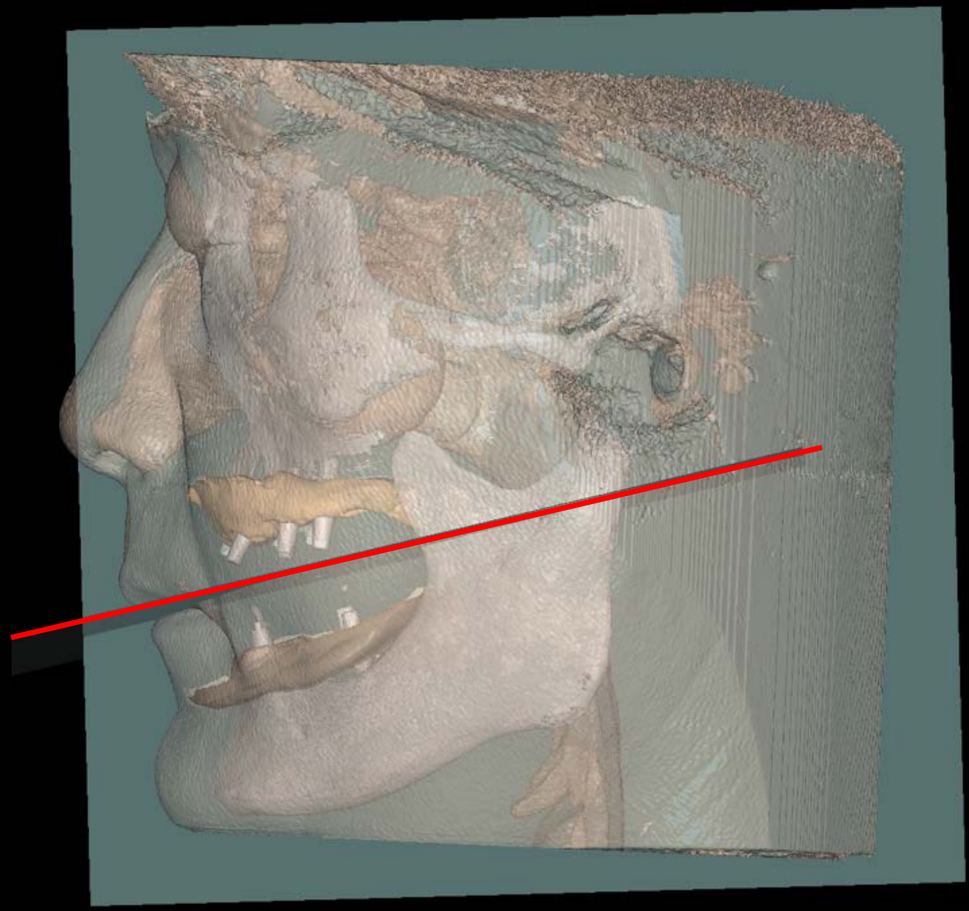
→ CT의 교합관계 기준으로
working model 정합

abutment (Ti-base) library stitching

Final impression process with Digital

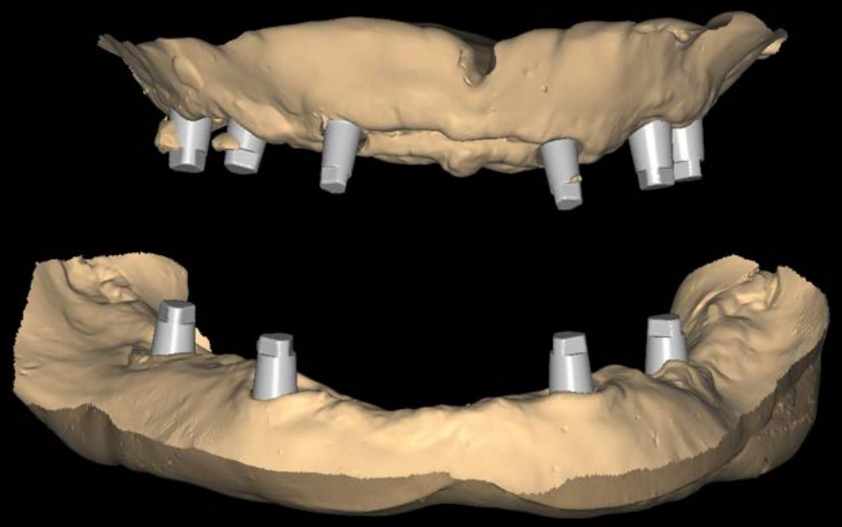
5) Dental CAD : data stitching

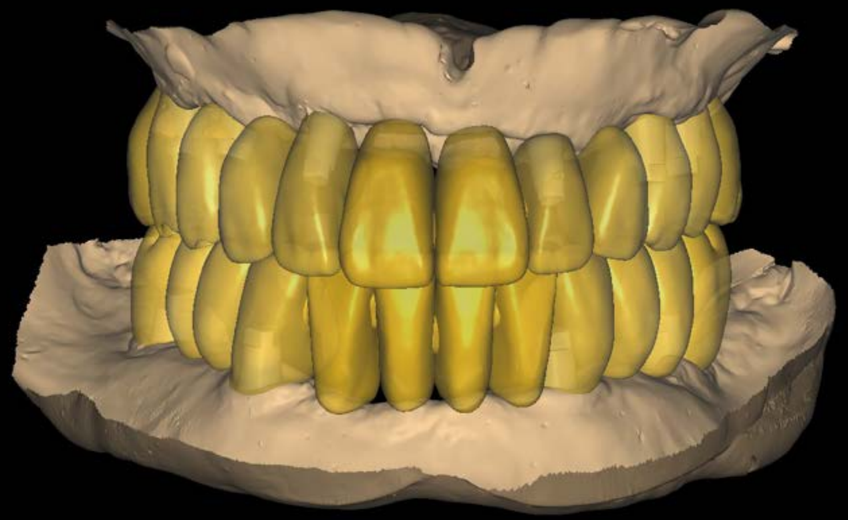




CT STL(hard tissue, soft tissue) + Plane + working model

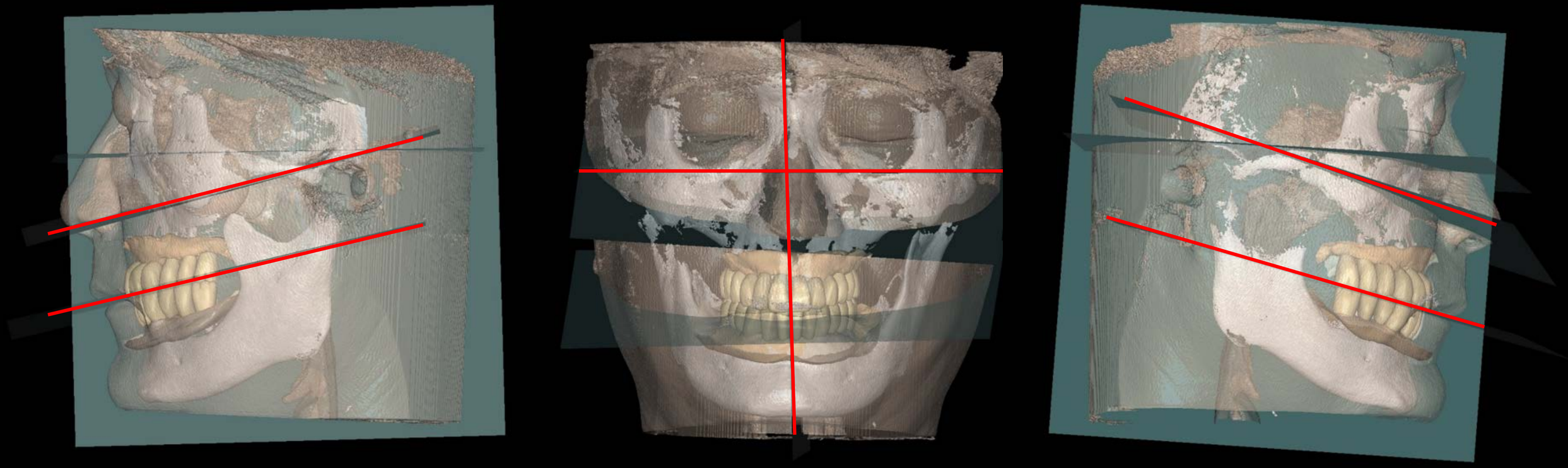
5) Dental CAD : Crown design





Final impression process with Digital

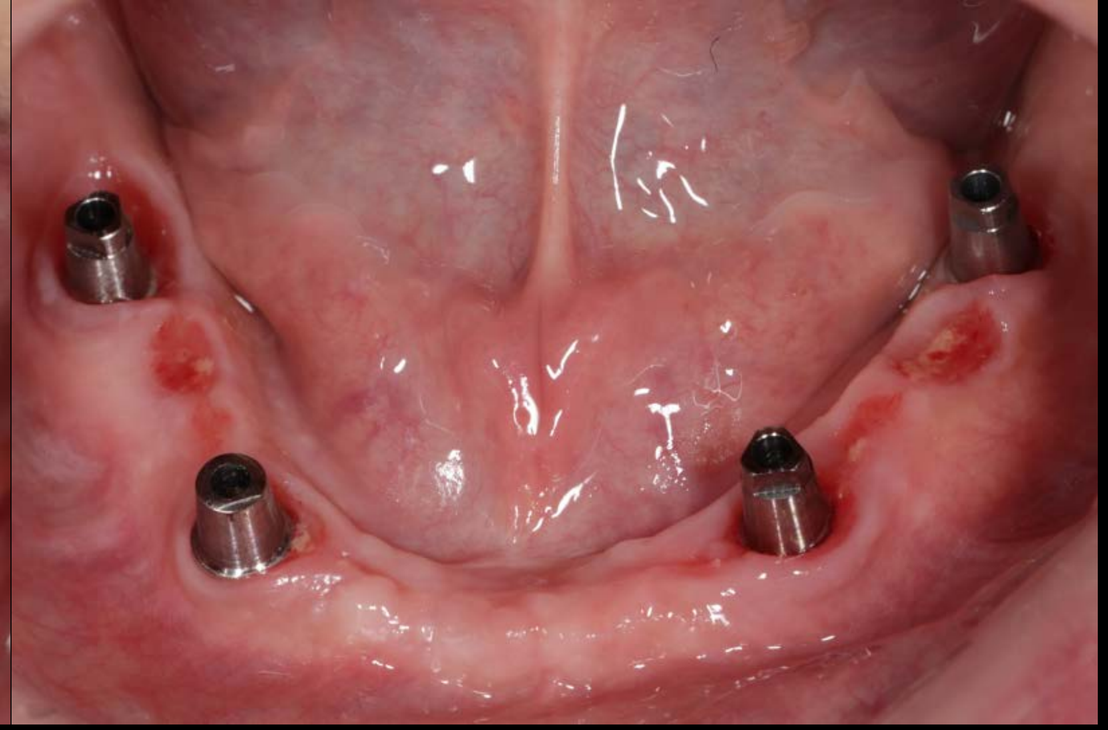
5) Dental CAD : Crown design



Milling / coloring / Sintering / Glazing

Milling / coloring / Sintering / Glazing

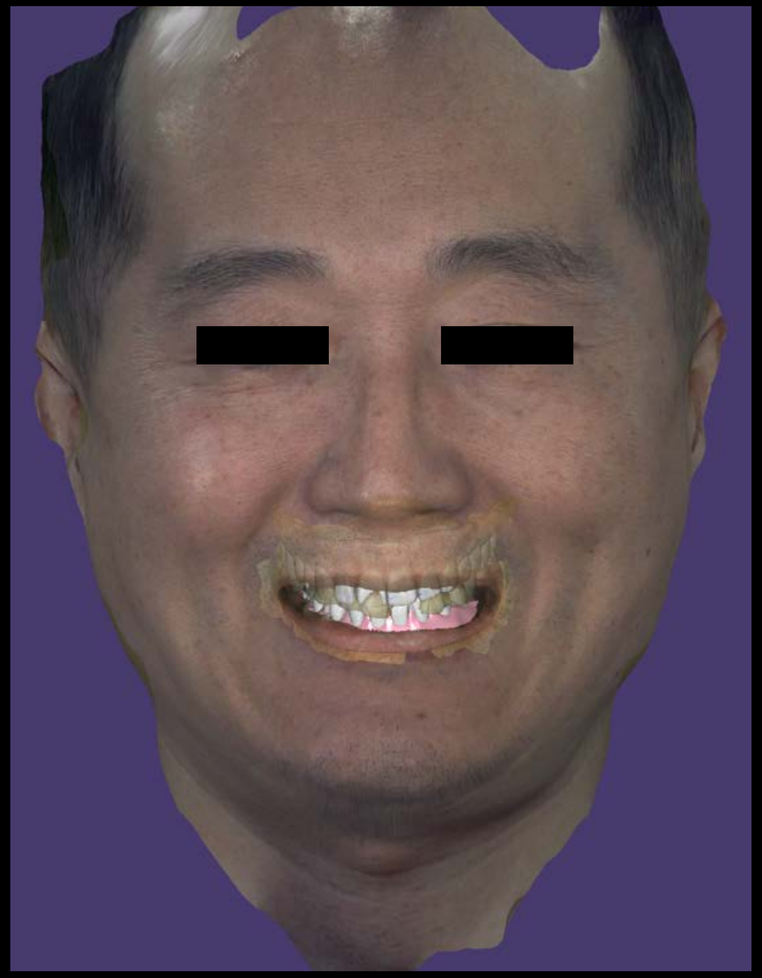
Final prosthesis (2024-01-21)



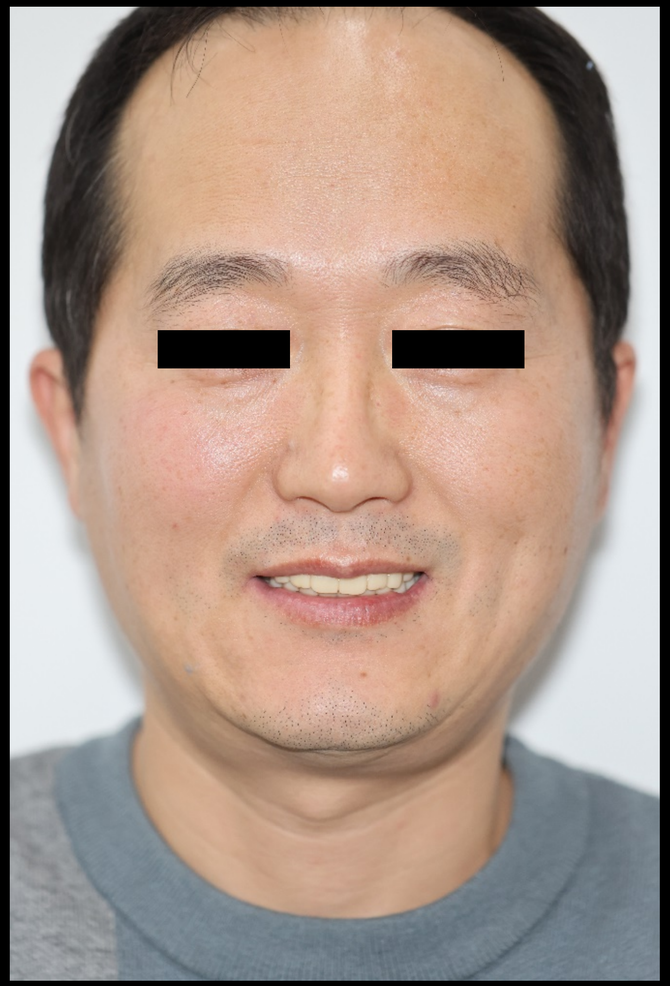
Final prosthesis (2024-01-21)

Final prosthesis (2024-01-21)

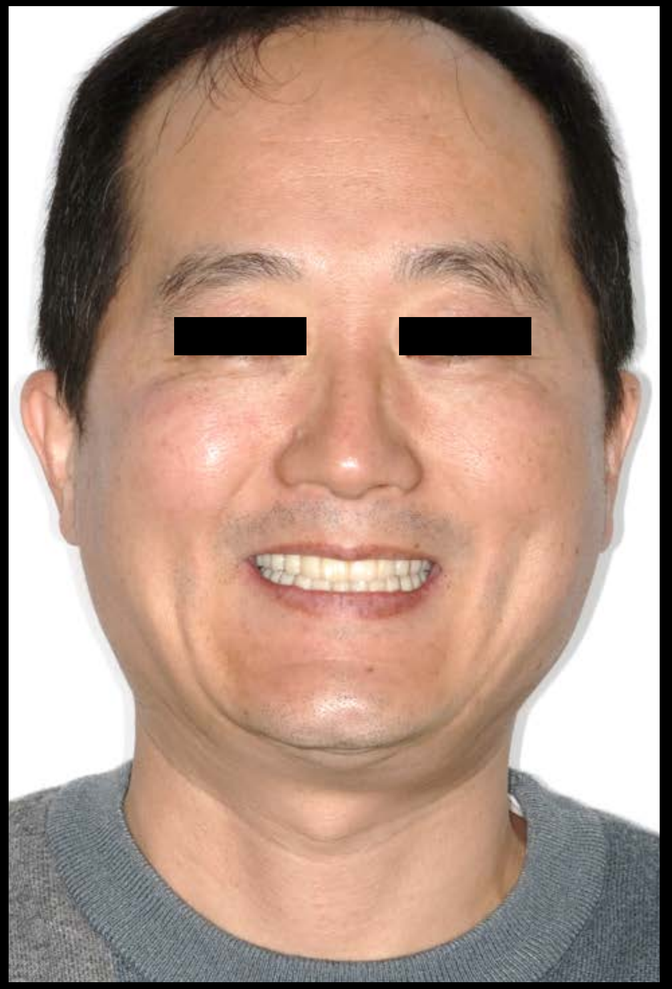
Final prosthesis (2024-01-21)



Initial State



Provisional restoration



Final prosthesis

Bite check (2024-02-20)

Bite check (2024-02-20)

Final prosthesis (2024-01-16)

AI Auto-Tracing

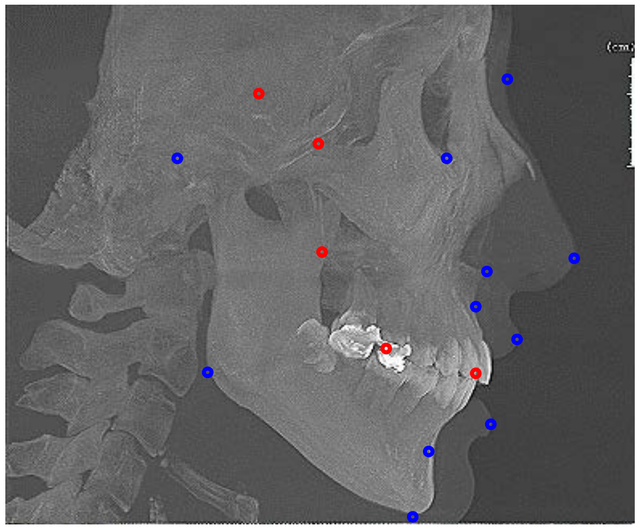
Dentium

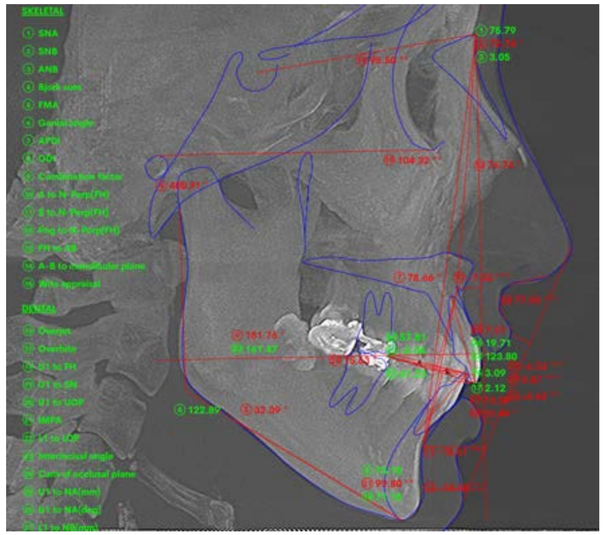
CT (2TS)

Virtual Ceph

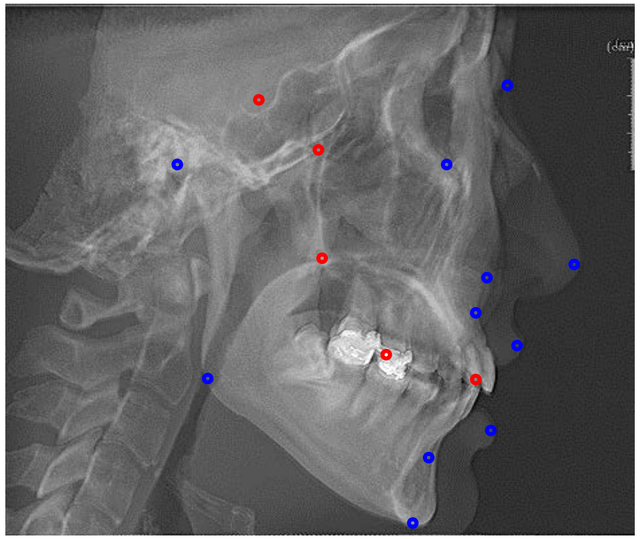
AI auto-tracing

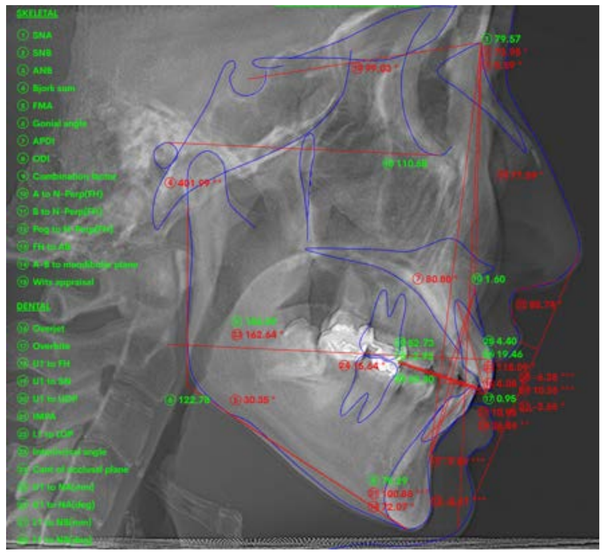
MIP





Average





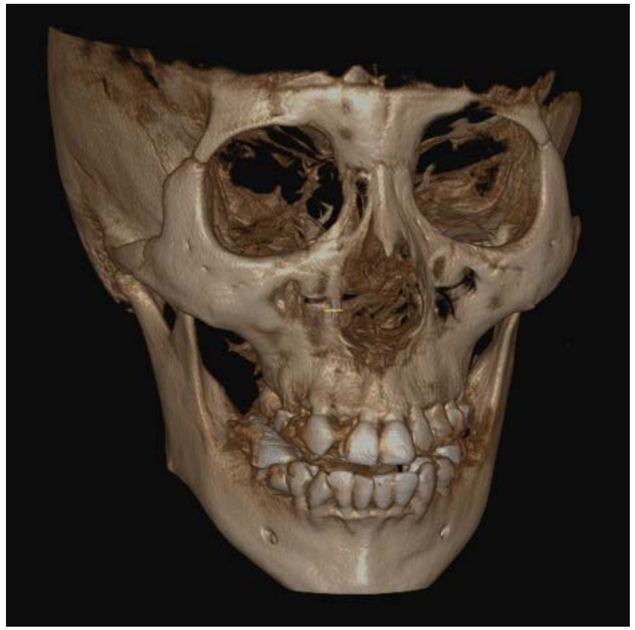
Virtual Ceph AI Tracing

Dentium

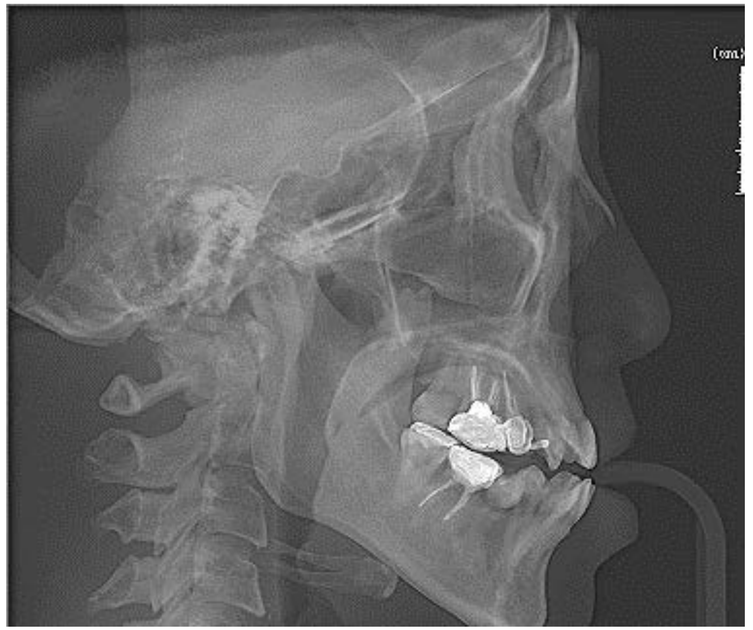
CT(2-tile stitching) based Virtual Ceph

Clear image, anatomical landmark

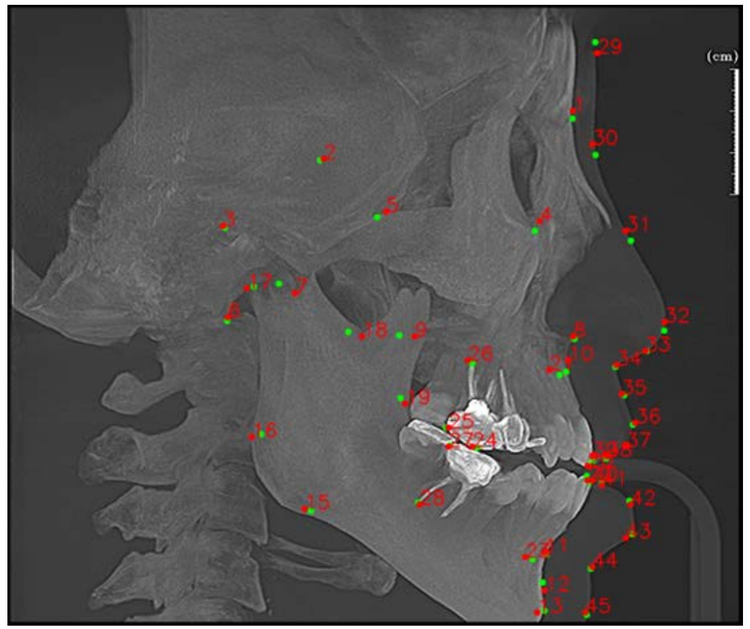
CT (2TS)



Virtual Ceph



AI Landmark



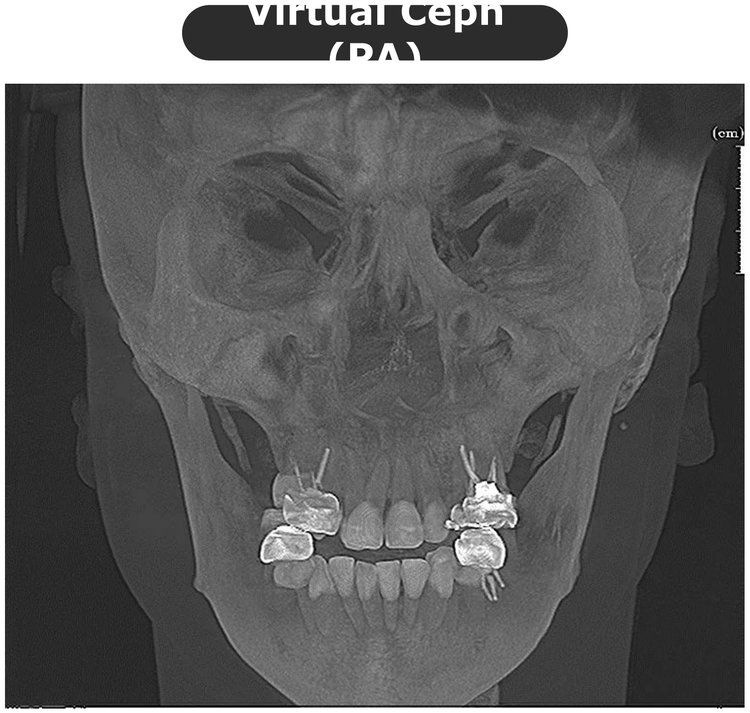
Green : ground truth
Red : prediction

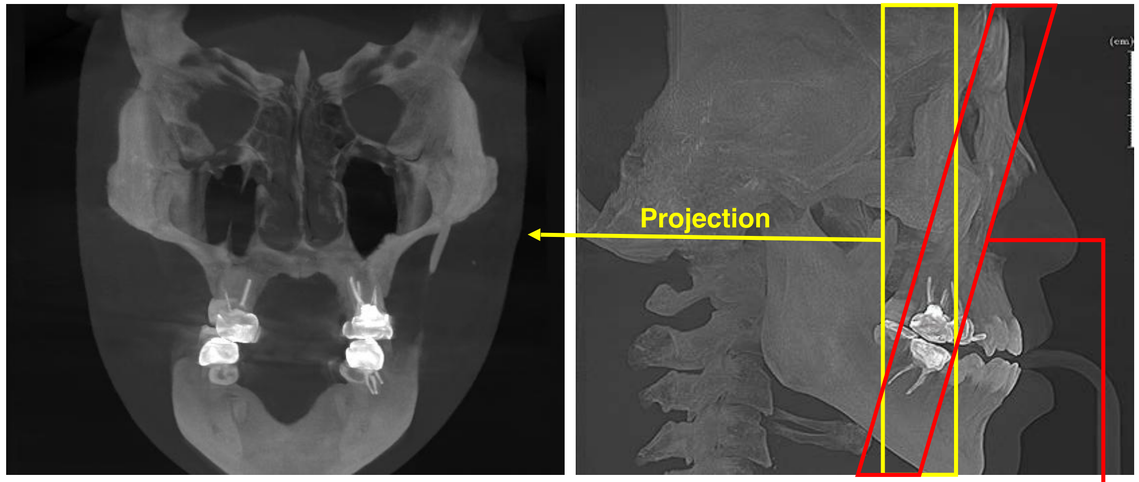
Virtual Ceph AI Tracing

Dentium

Multi-planar Virtual Ceph ; PA

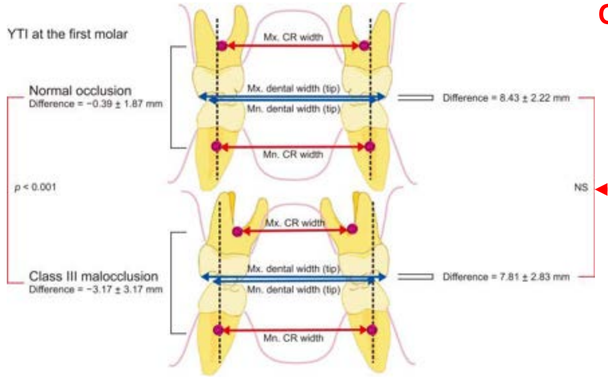
Facial Asymmetry, Mandibular Yawing, Transvers Occlusion





ROI(region of image) Projection

Occlusal plane based projection



YTI (Yonsei Transverse Index)

2 types of Zirconia

2 hour fast sintered mono block
3 layer of different value

bright Mono

4.5Y 2h

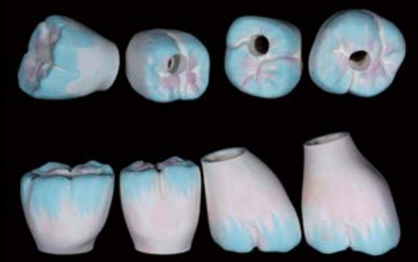
Only 1 Layer
(45%, 600MPa)

Fast Sintering

Case / Block	Single Crown		Bridge(3-unit-Bridge)	
	Anterior	Posterior	Anterior	Posterior
bright Mono	●	●	●	○

● Recommend ○ Possible

2hr Fast Sintering



Coloring

Sintering

Final Prosthesis

2hr Fast Sintering

Coloring

Sintering

Final Prosthesis

Dentium

Natural tooth Case_2

Shade Taking : A3

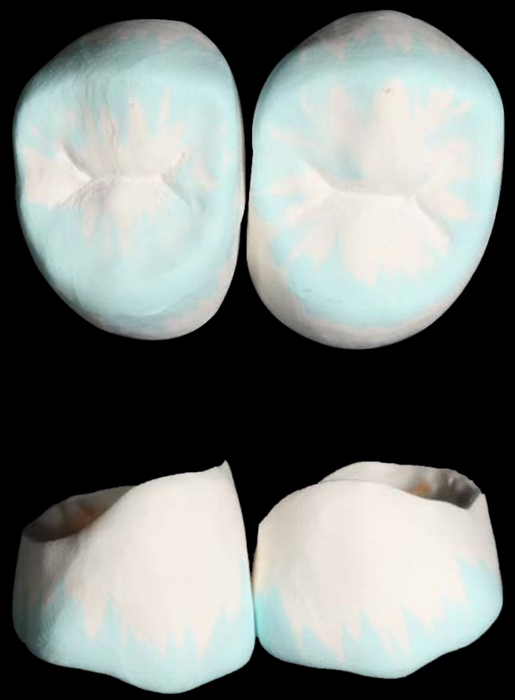
Inner – White Opaque
Occlusal - Trans violet
Light gray

2h Fast Sinterng

Natural tooth Case_2

Natural tooth Case_3

Shade Taking : A3.5



Inner – White Opaque
Occlusal - Trans violet

2h Fast Sinterng

Natural tooth Case_3

Natural tooth Case_4

Shade Taking : A3

Inner – White Opaque
Body – A3
Occlusal - Trans violet

2h Fast Sinterng

Natural tooth Case_4

Bright MTA Sealer Plus

Root Canal Sealing Material

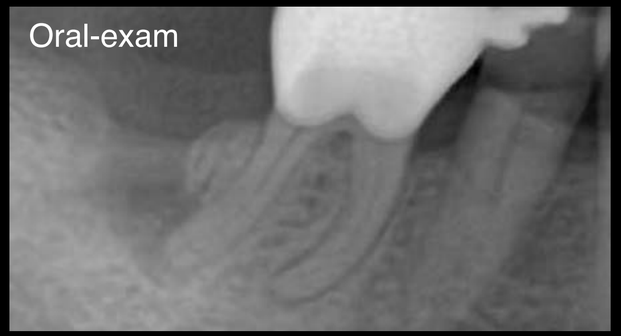
Excellent sealing and regeneration

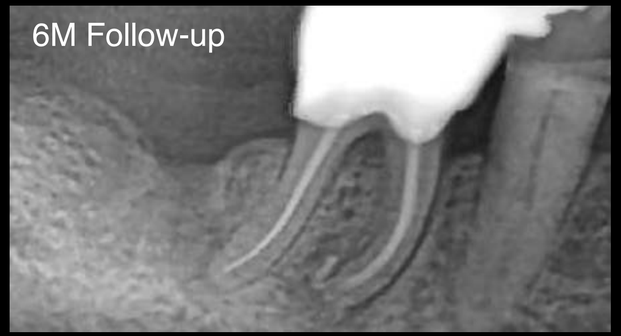
Ultra Antibacterial Effect

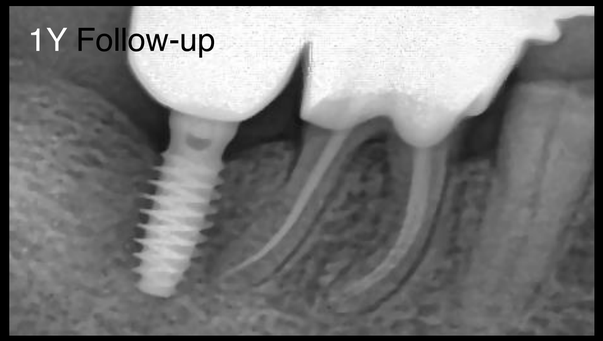
Calcium Silicate → Mineralization

High Flowability → Convenience Handling

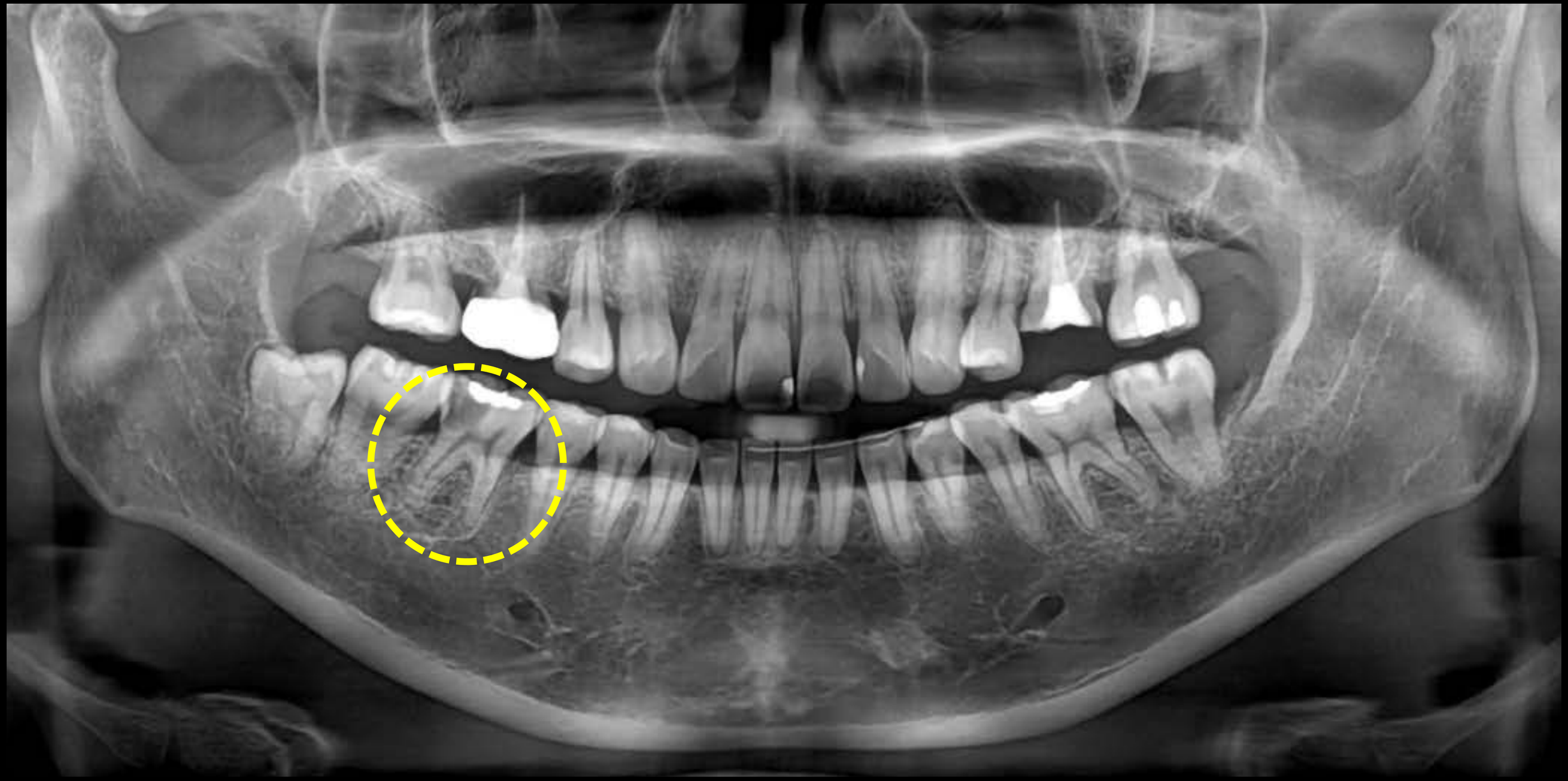
Excellent Radiopaque







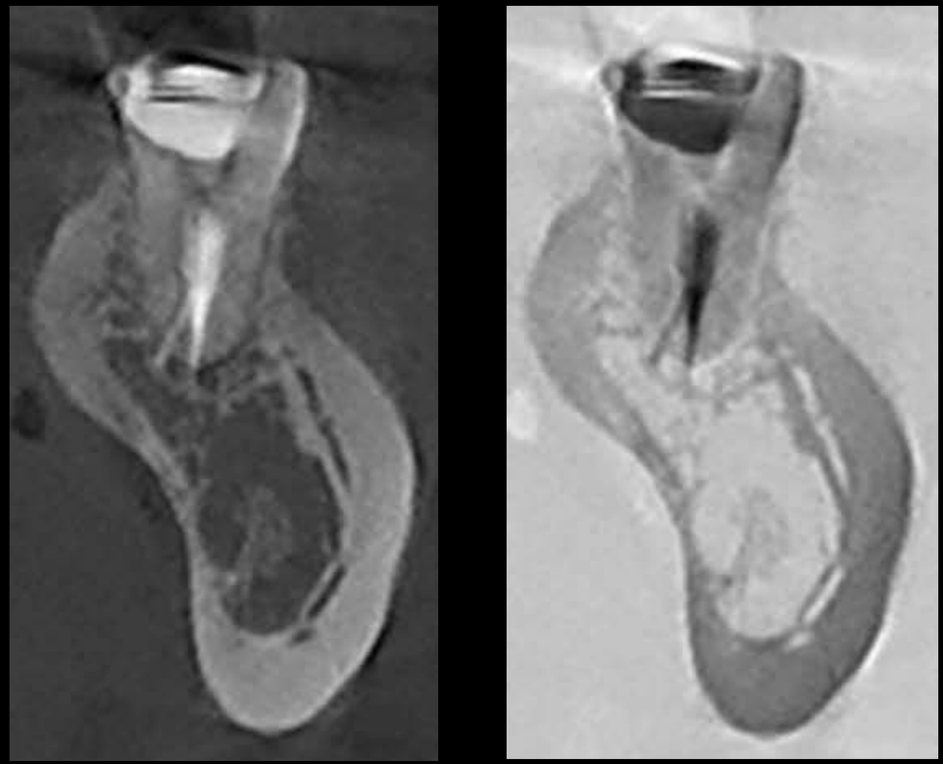
Oral exam (2023-11-18)



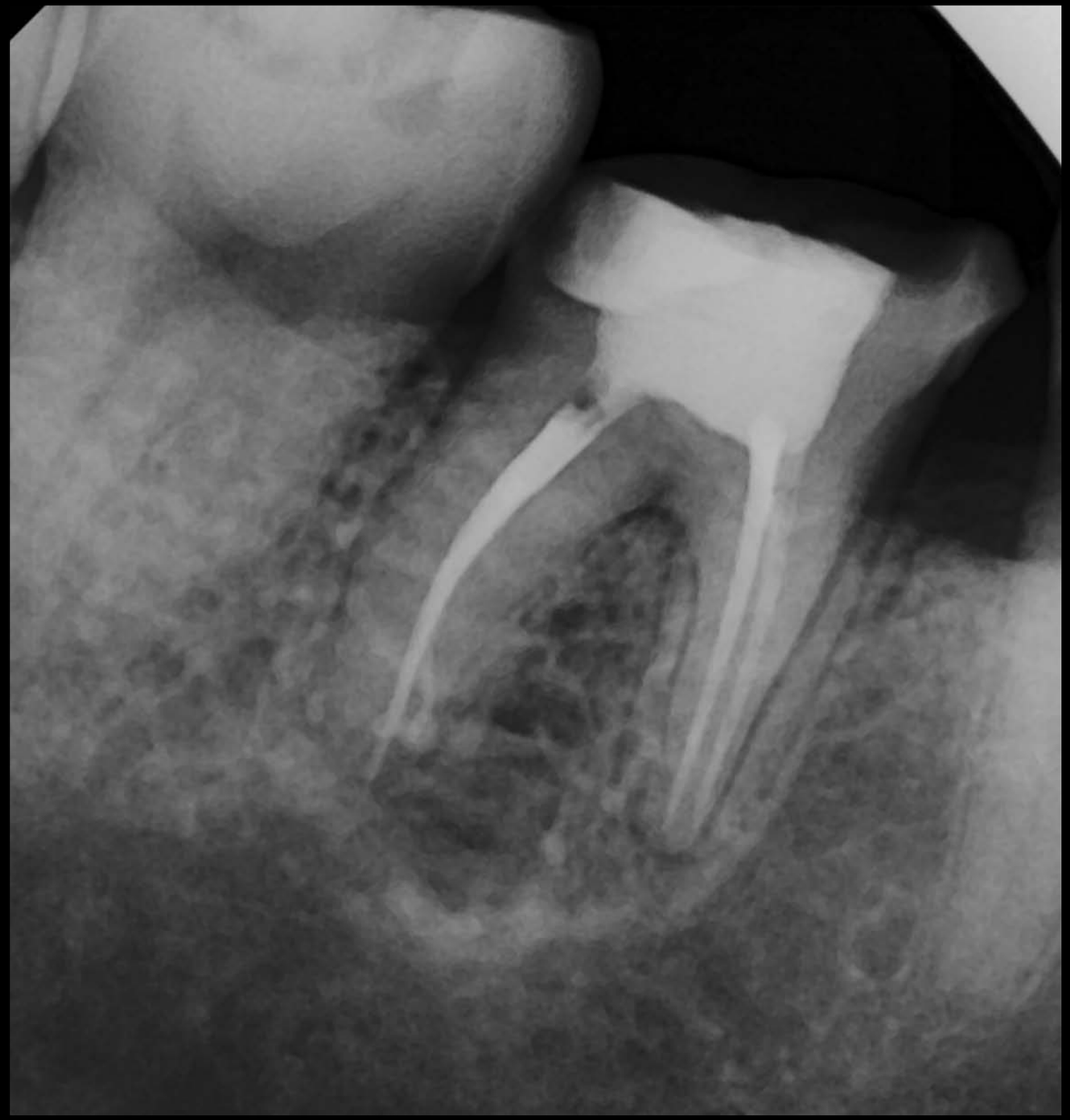
Post-op CT (2024-02-07)

< Mesial canal >

< Distal canal >



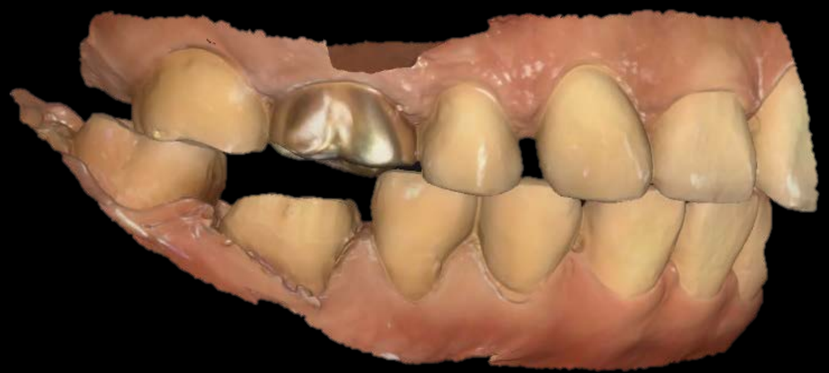
Follow up : 7 week (2024-03-27)



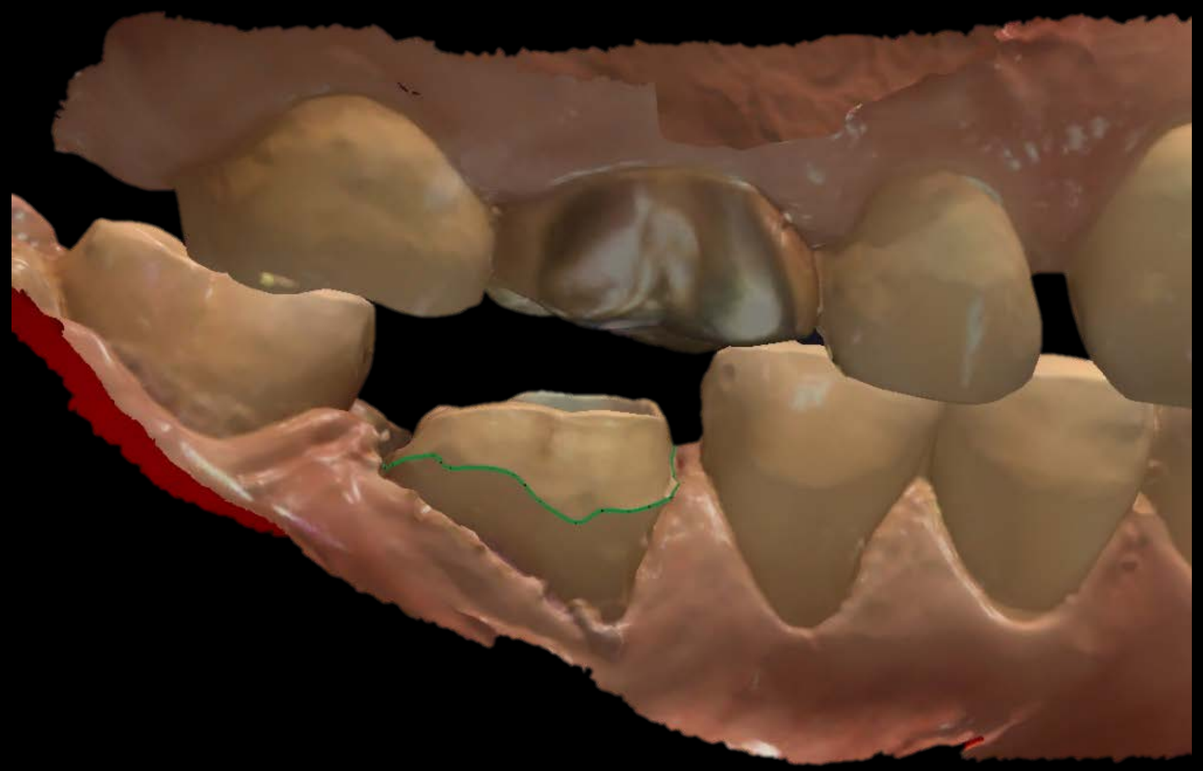
Case 2

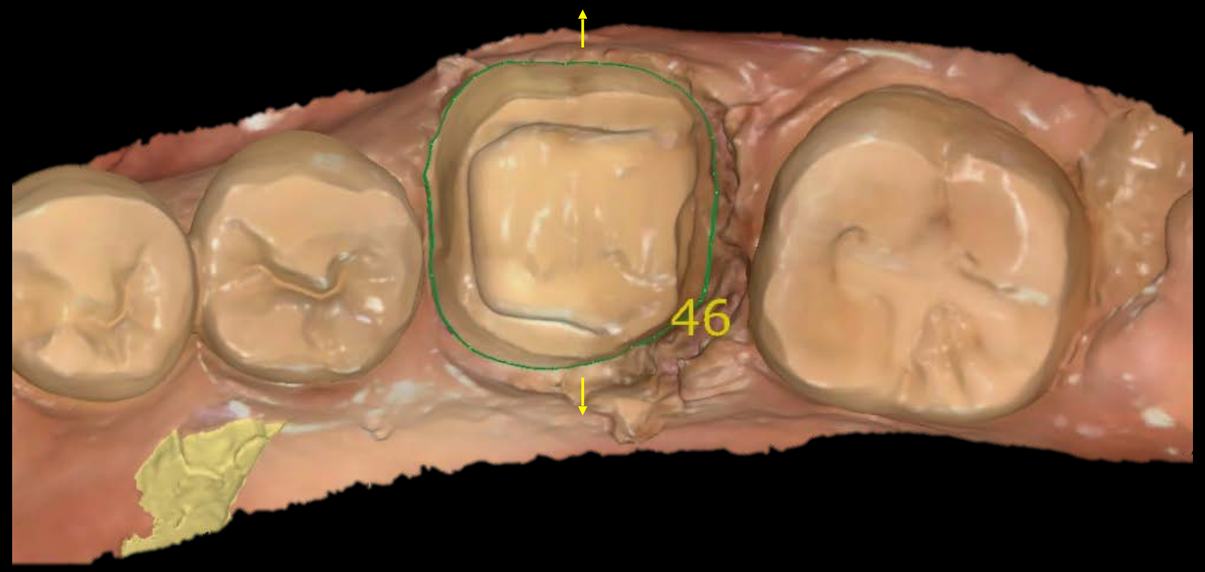
- #46
- Natural Tooth
- Shade A3.5
- Shade Block

Working model

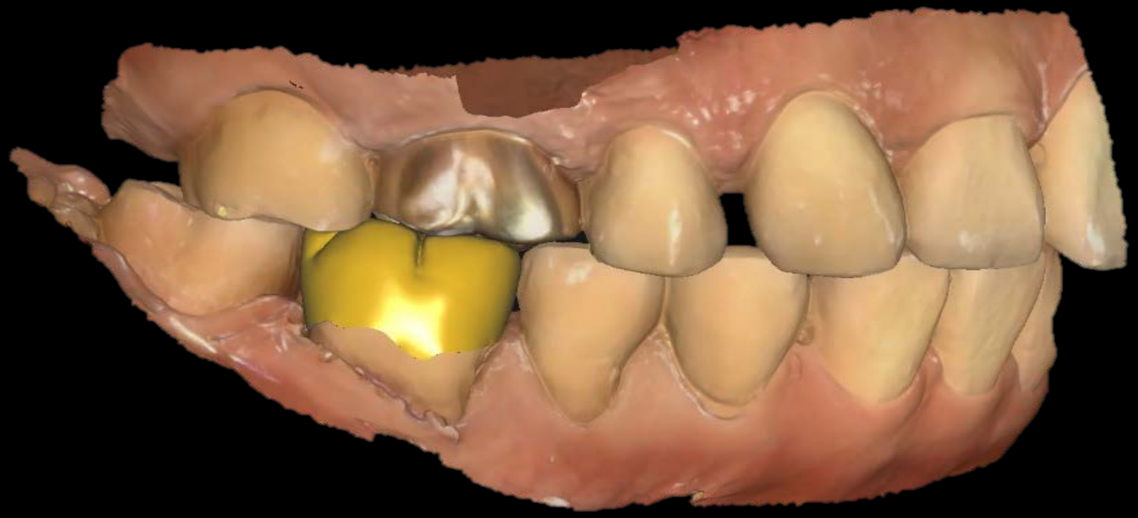


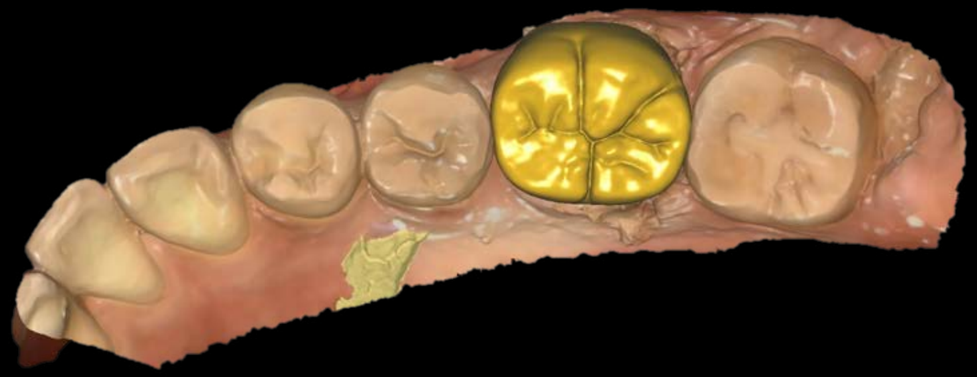
Working Model

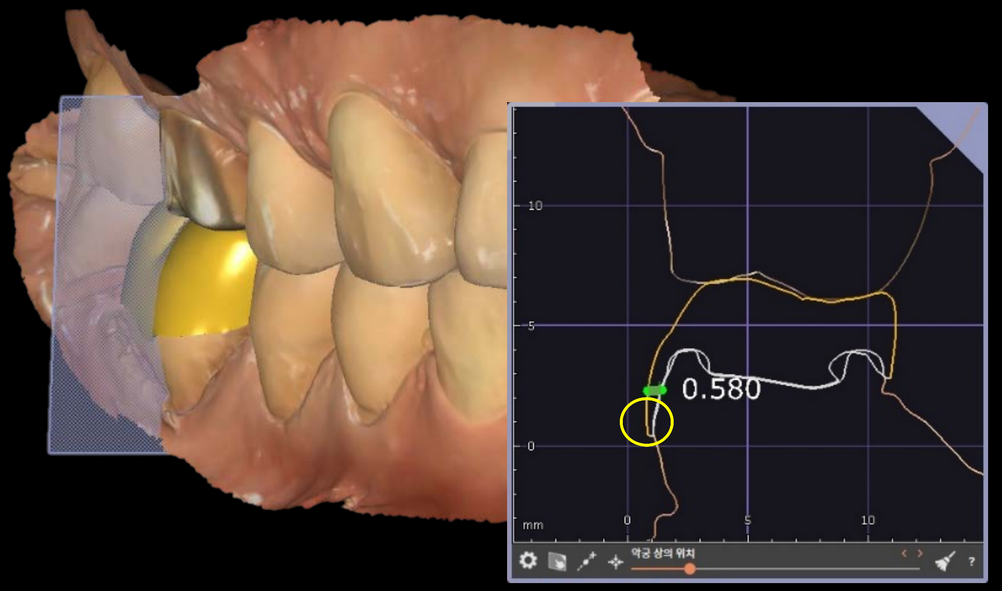




Cad Design

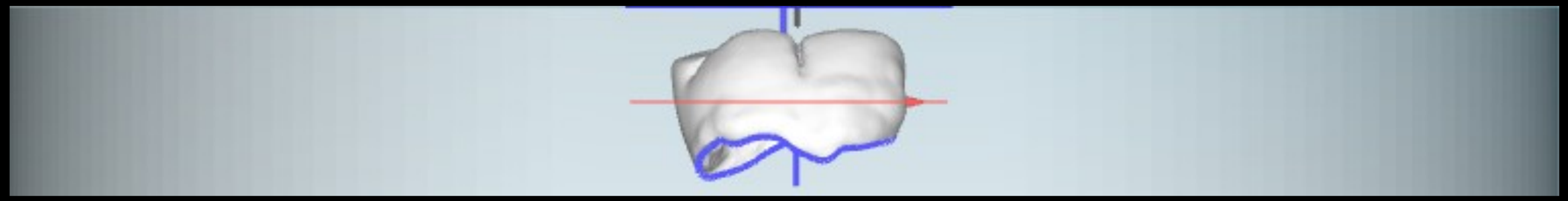






Shade Taking

Hyper Dent



Shade Block A2

Coloring

Inner – White Opaque
Cervical, Groove – A3.5
Occlusal – Light Gray

Glazing

Final Prosthesis

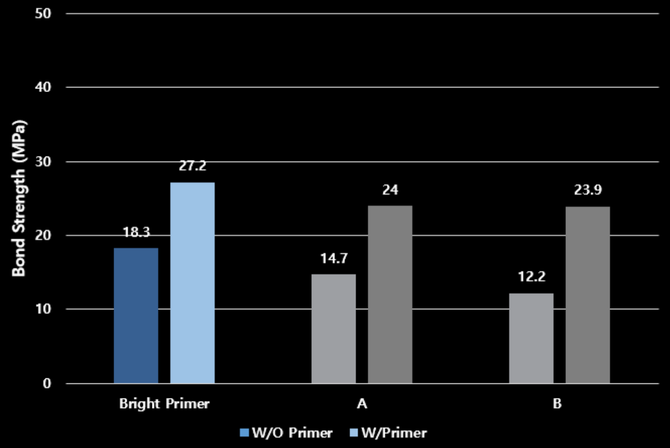
Resin

Bright Primer

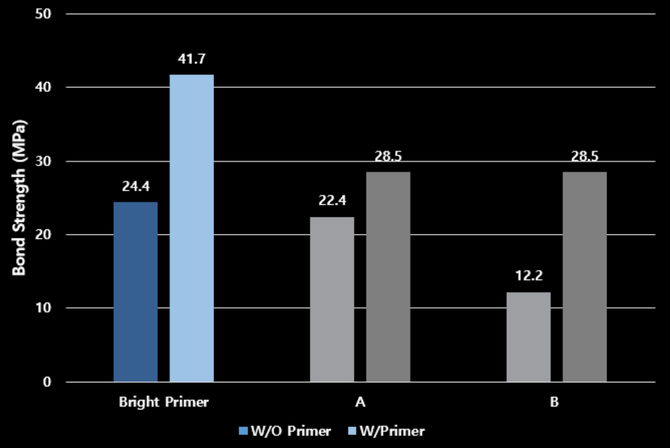
- **Universal Primer containing 10-MDP**
- Improves Bond strength between cement and restorations
- Excellent bond strength to Zirconia & Metal & LS2

Bond Strength

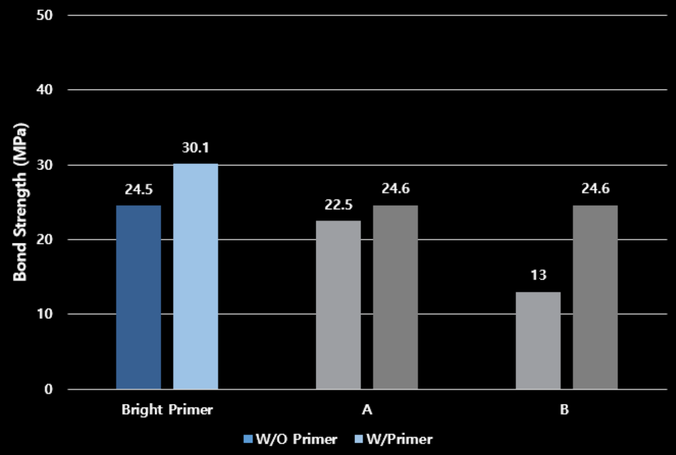
@ Zirconia



@ Metal



@ LS2

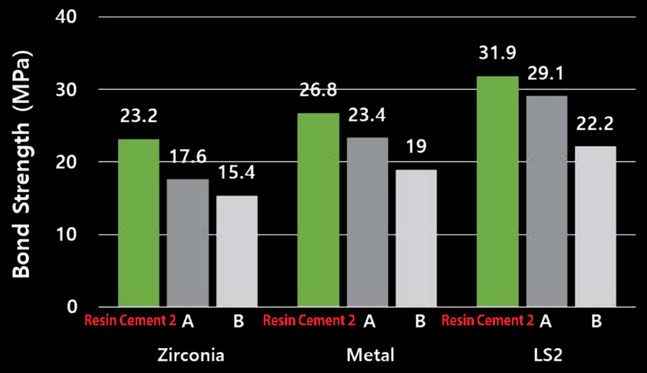


Resin

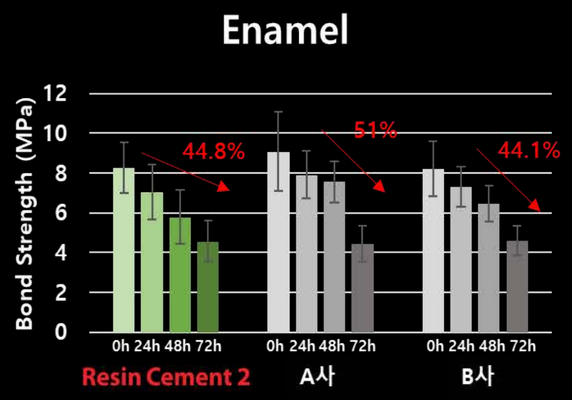
Bright Resin Cement 2

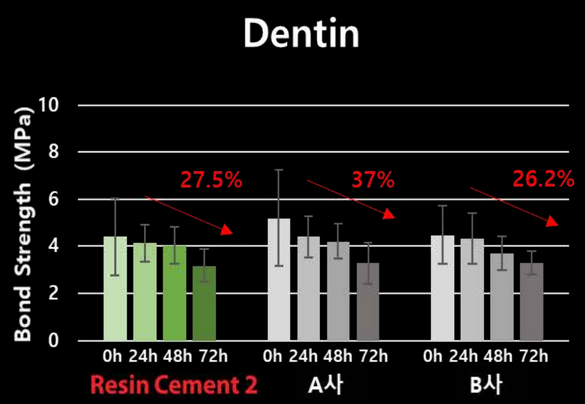
- **Strong (10-MDP) → Strong bonding to indirect restoratives**
- Stable storage stability in both refrigerated and R.T storage
- Long Working time (≥ 2 min) / Short Setting time (≤ 4 min)

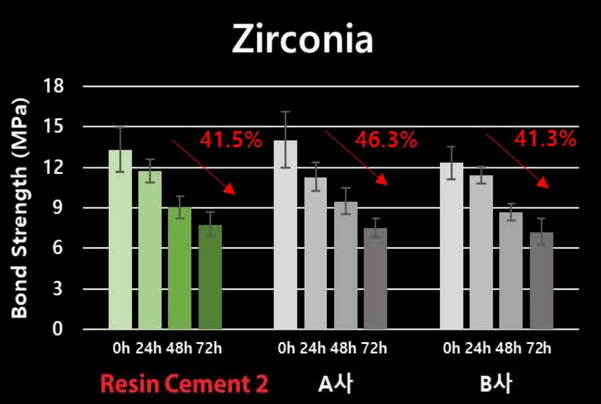
Bond Strength

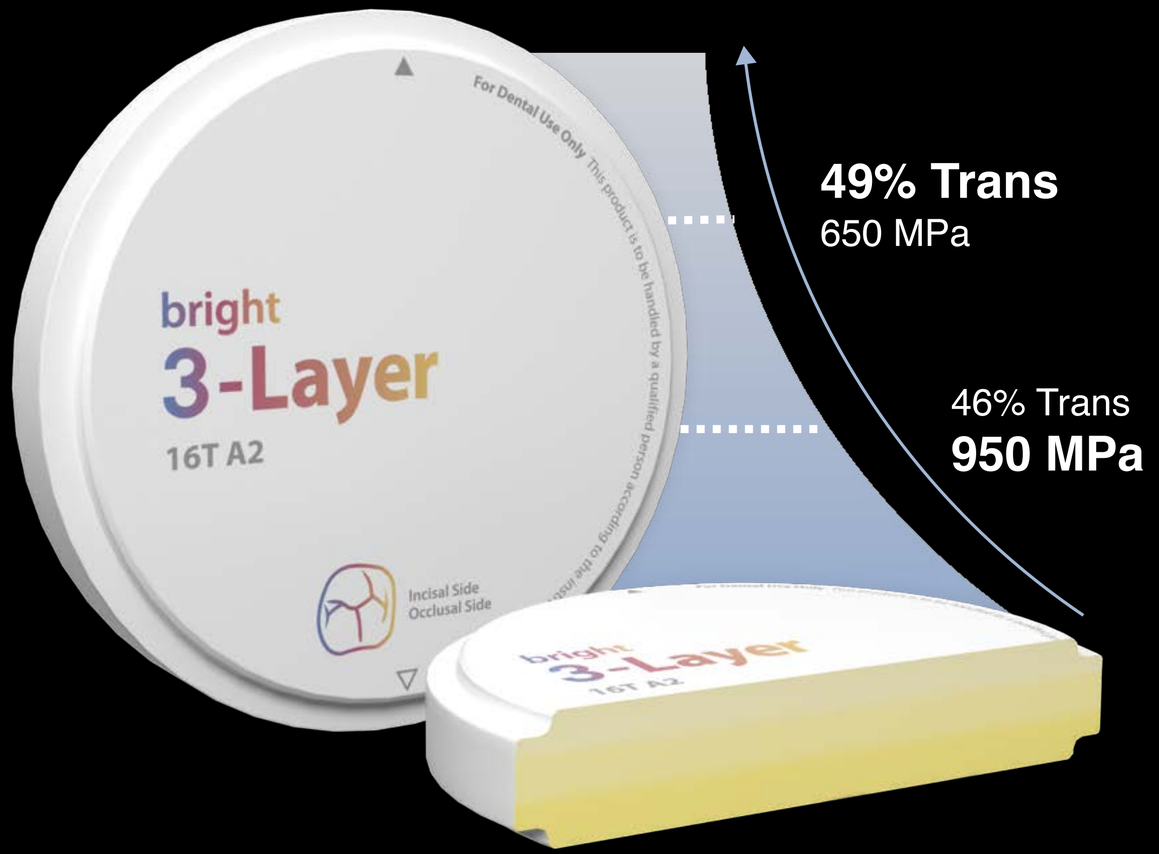


Adhesion durability (72h F/U)









49% Trans
650 MPa

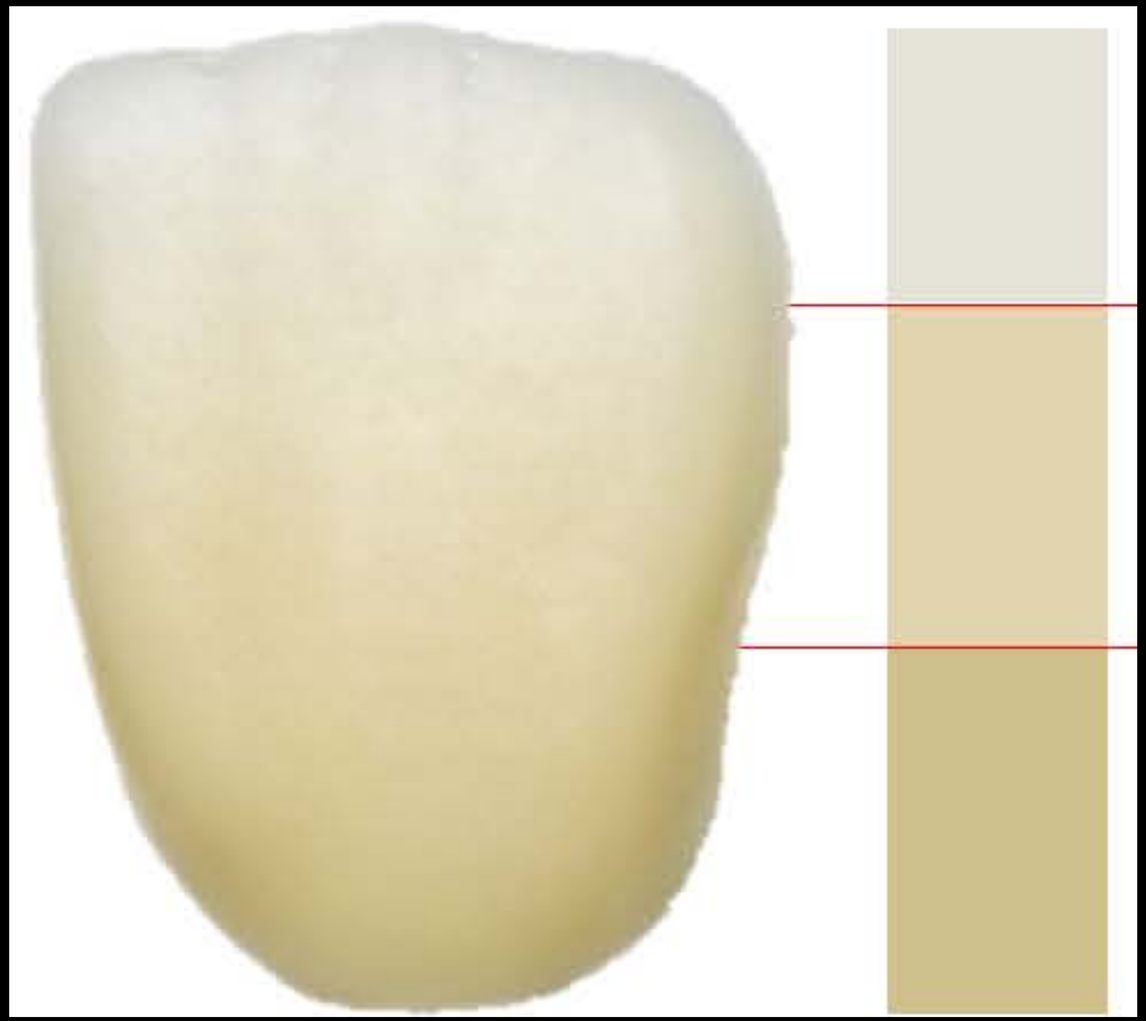
46% Trans
950 MPa

bright 3-Layer

NO Coloring
Staining

Dentium

3 layer Zr block



5 Y

Translucent 48
Value -0.3

5Y + 4Y

Translucent 47
Value 0

4Y

Trandlucent 46
Value +0.3

Natural teeth prosthesis _ upper Anterior

Case report 1

- # 11, 12, 22
- Natural Teeth
- bright 3 Layer Block
- Shade A3

Natural teeth prosthesis _ upper Anterior

Final prosthesis

내면 – White opaque

bright 3 Layer A3

Natural tooth Case_2

Shade Taking : A3

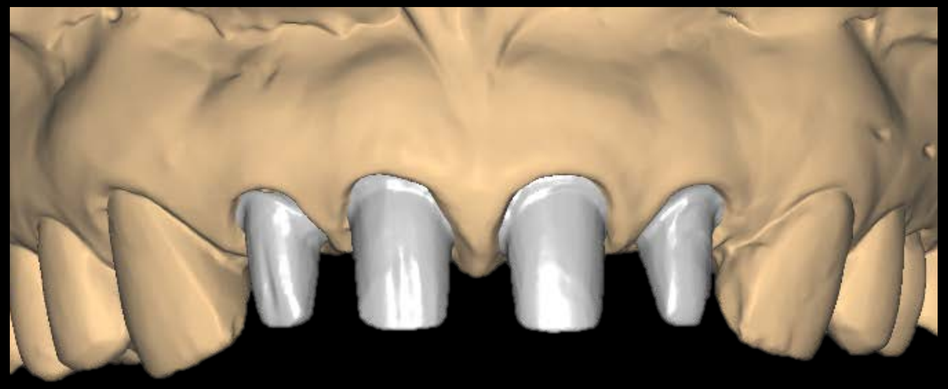
Natural tooth Case_2

Natural tooth Case_3

Shade Taking : A3

Natural tooth Case_3

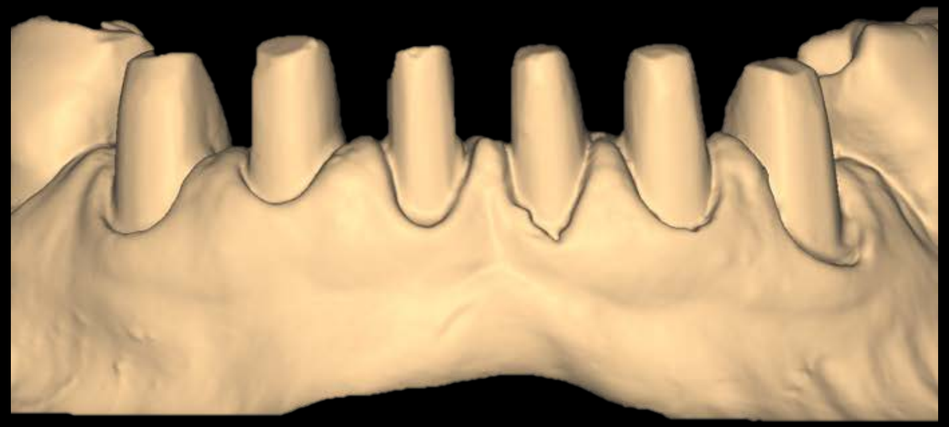
Natural tooth Case_4



Shade Taking : A3

Natural tooth Case_4

Natural tooth Case_5



Shade Taking : A3.5

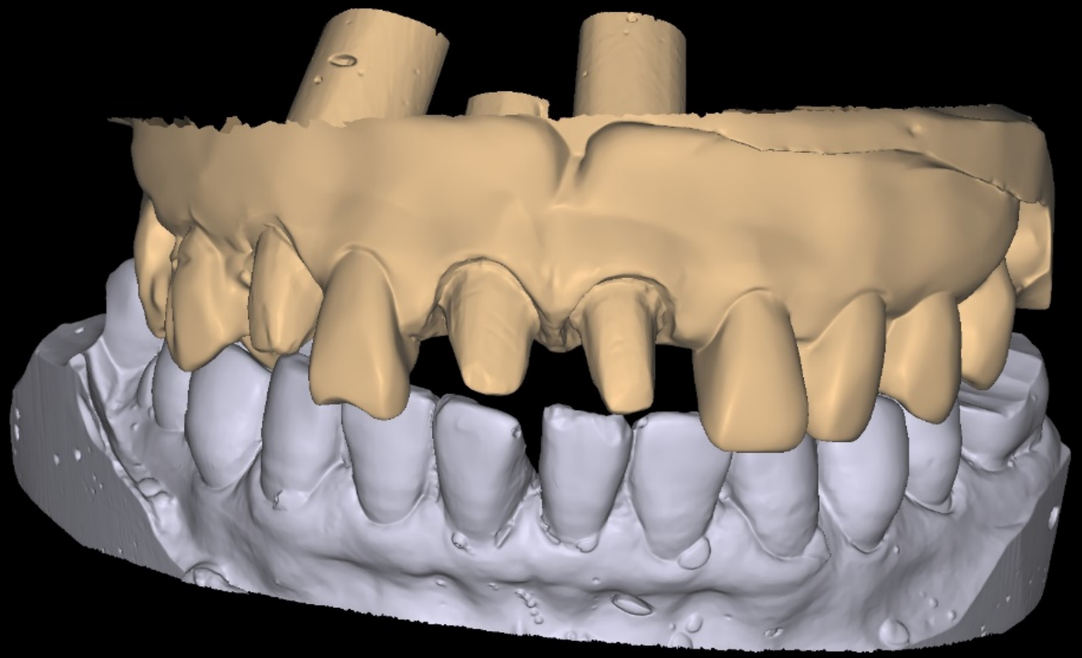
Natural tooth Case_5

Oral exam (2023-09-06)

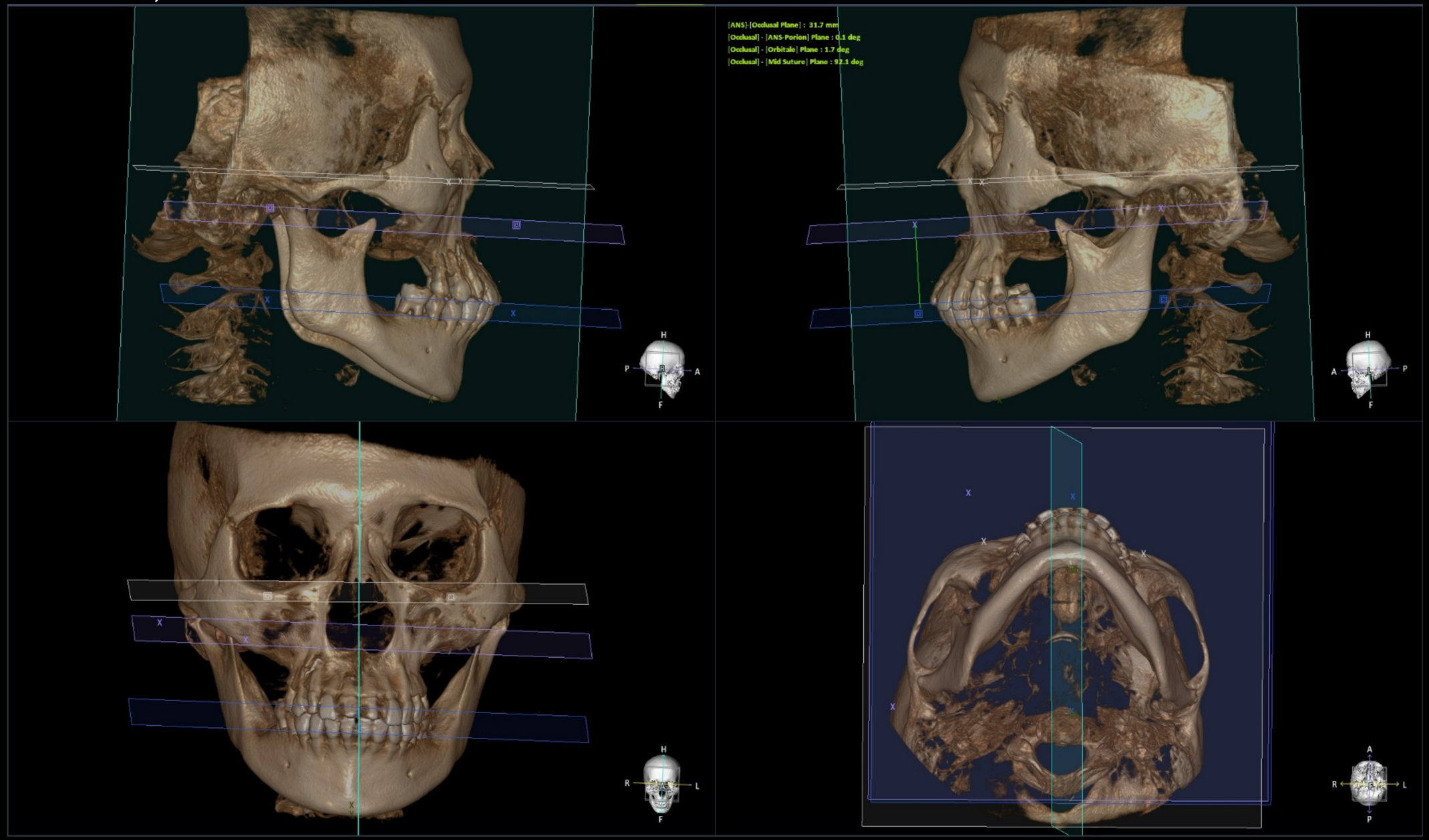
Pre-op (2023-09-06)

Shade taking (2023-09-06)

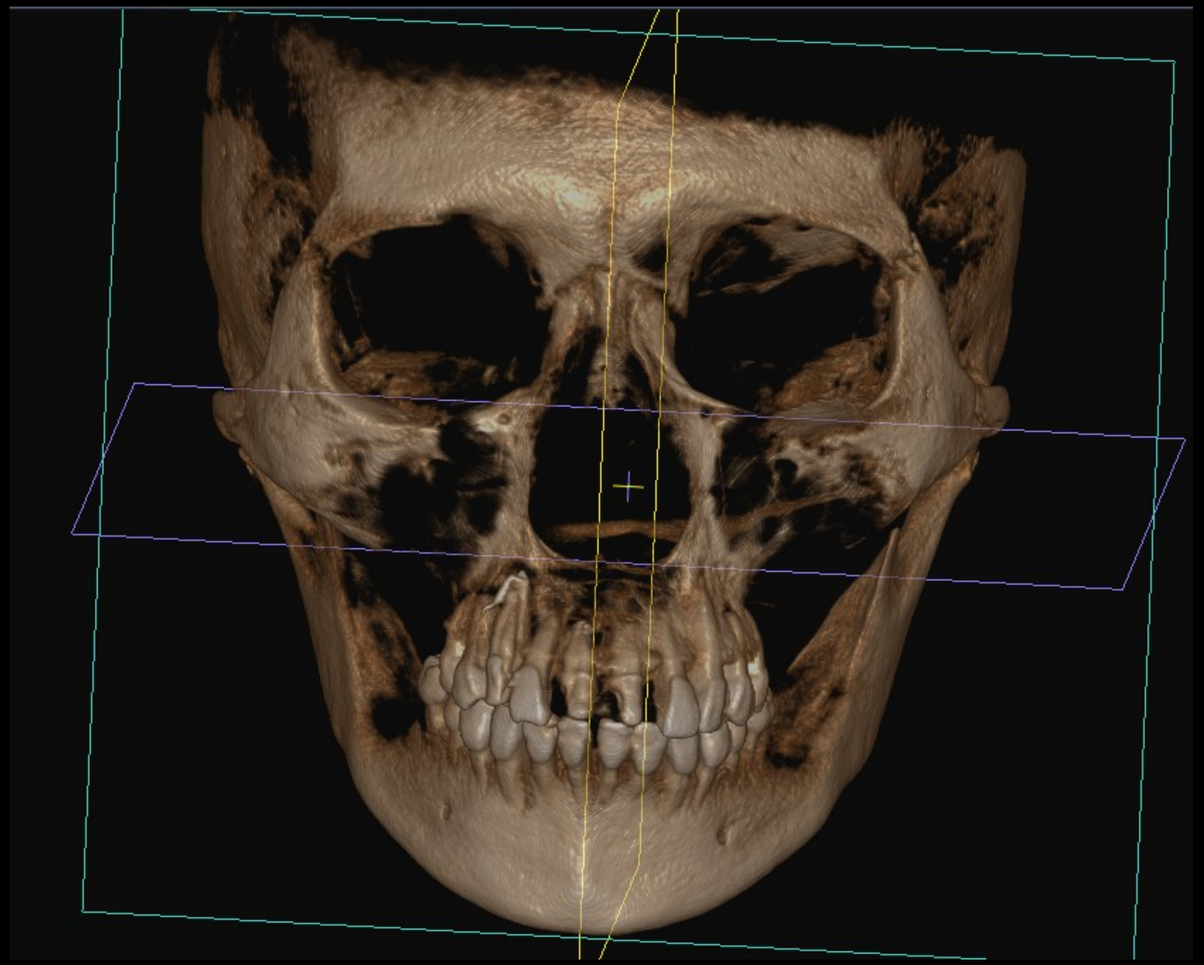
Working model (bite tray impression scan)



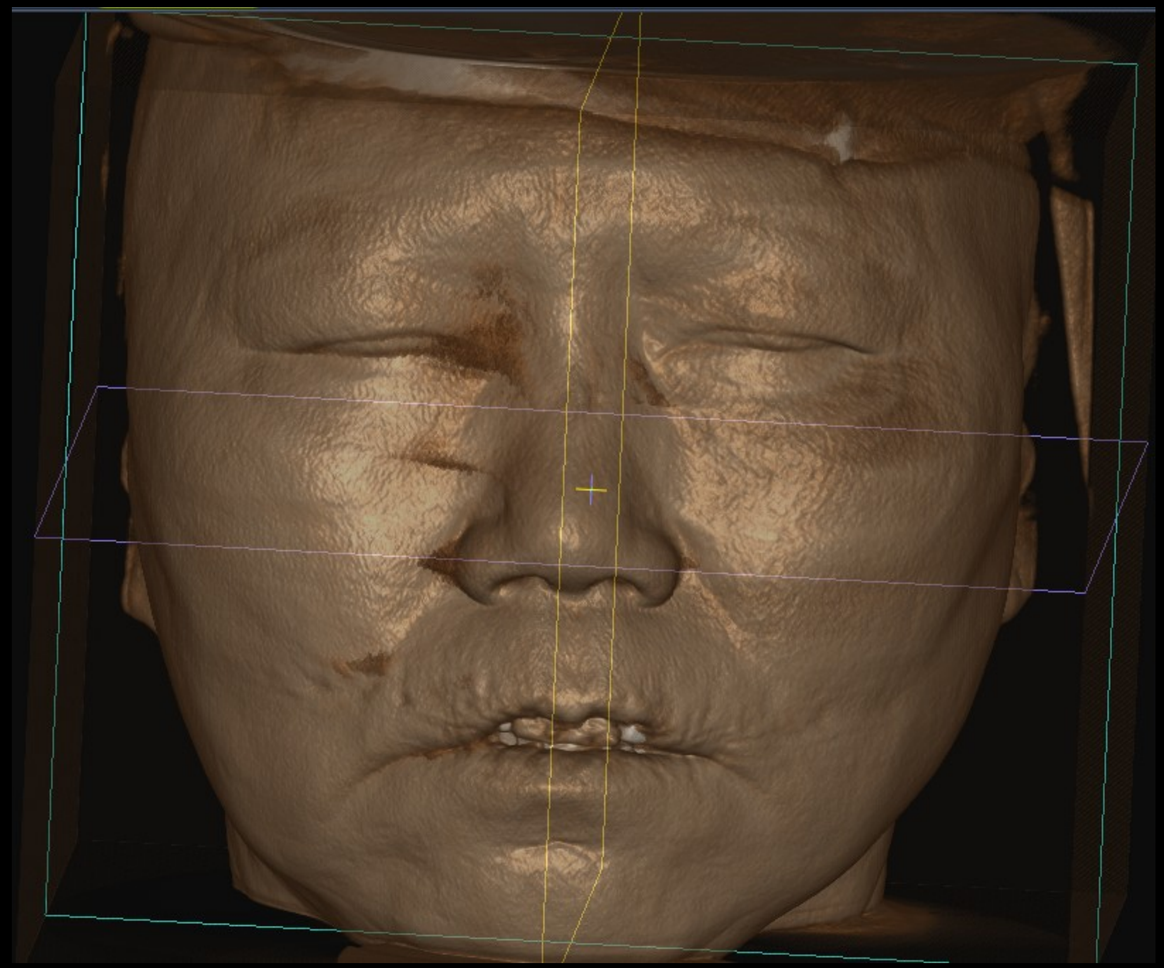
AI Occlusal plane
(rainbow 3D viewer)



CT STL export (rainbow 3D Viewer)

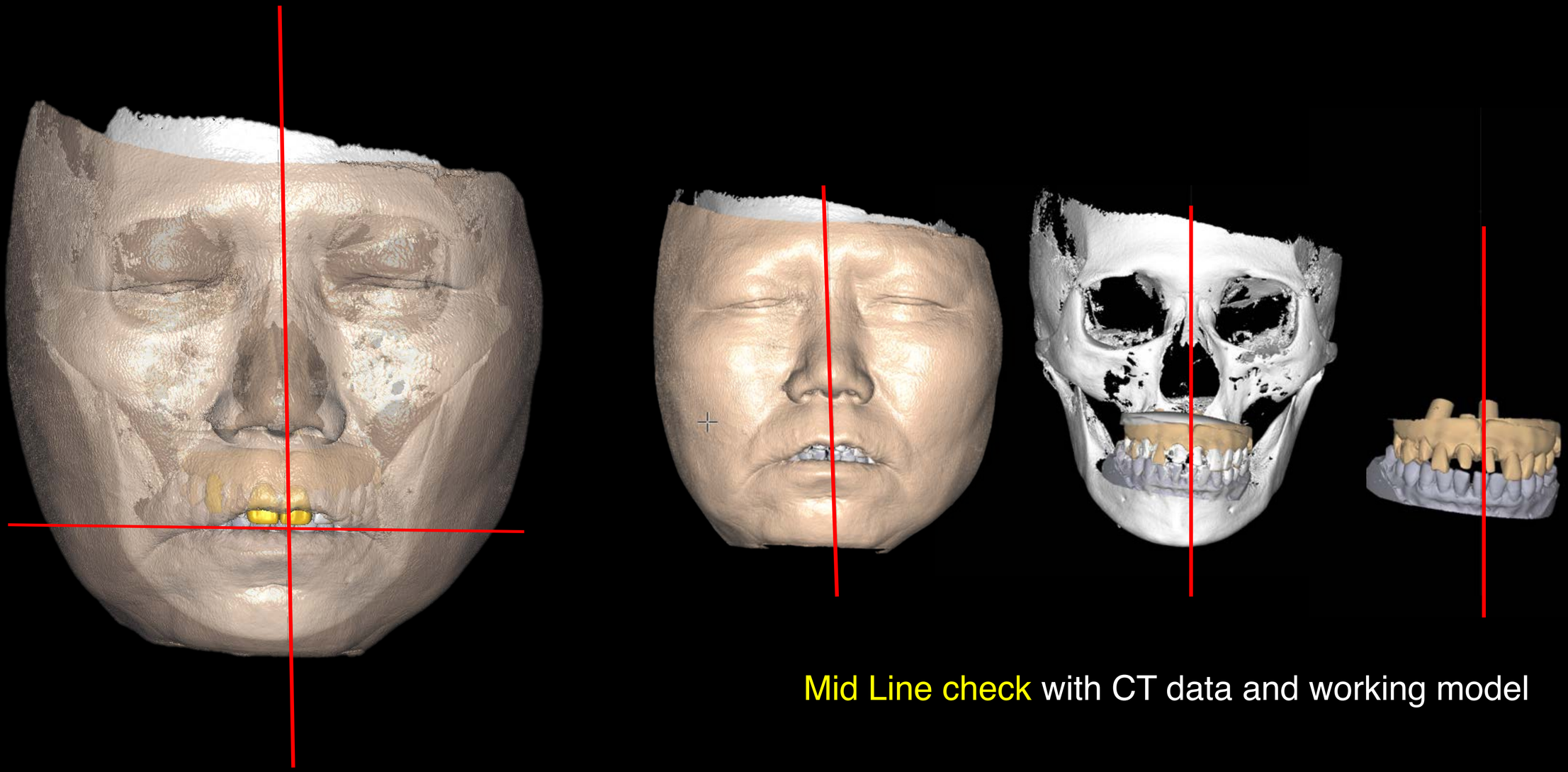


Hard tissue



Soft tissue

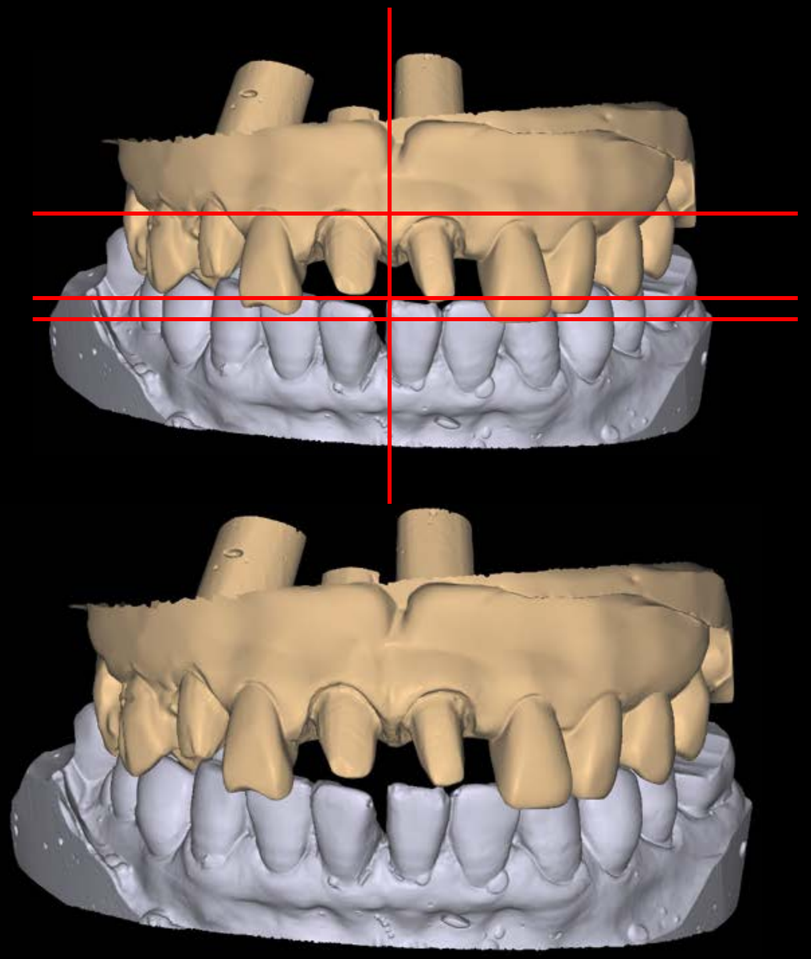
All data stitching
(CT STL + Plane + working model)



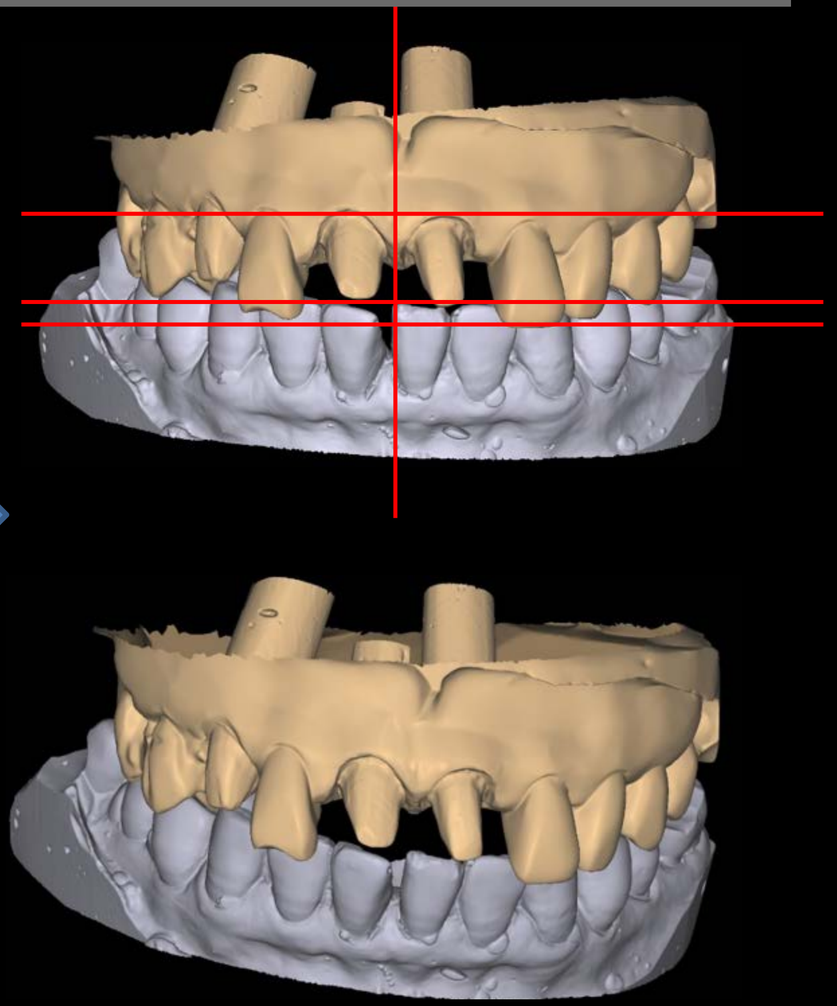
Mid Line check with CT data and working model

Tooth Axis & Mid line check

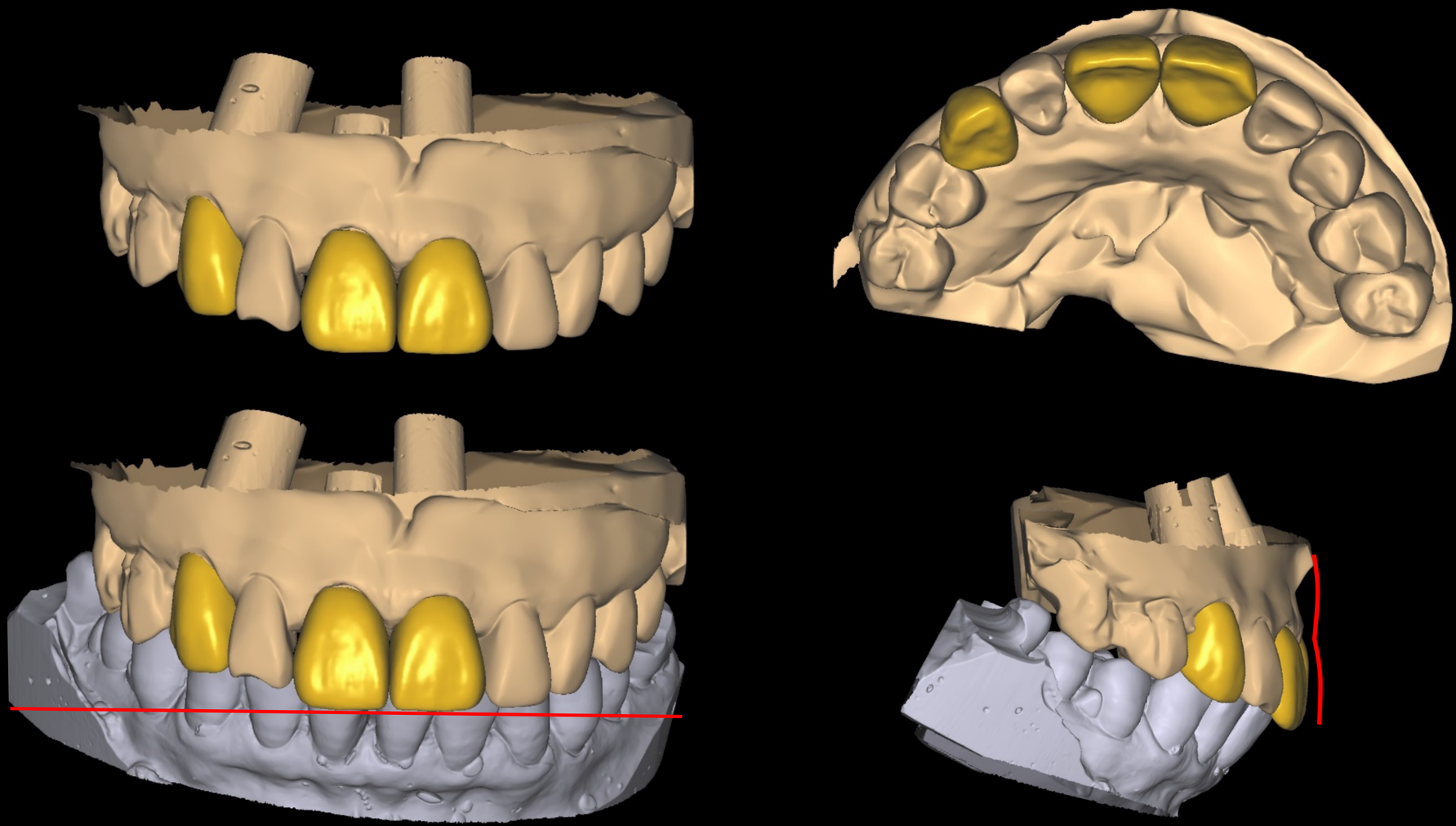
Tooth Axis & Mid Line check
with only working model



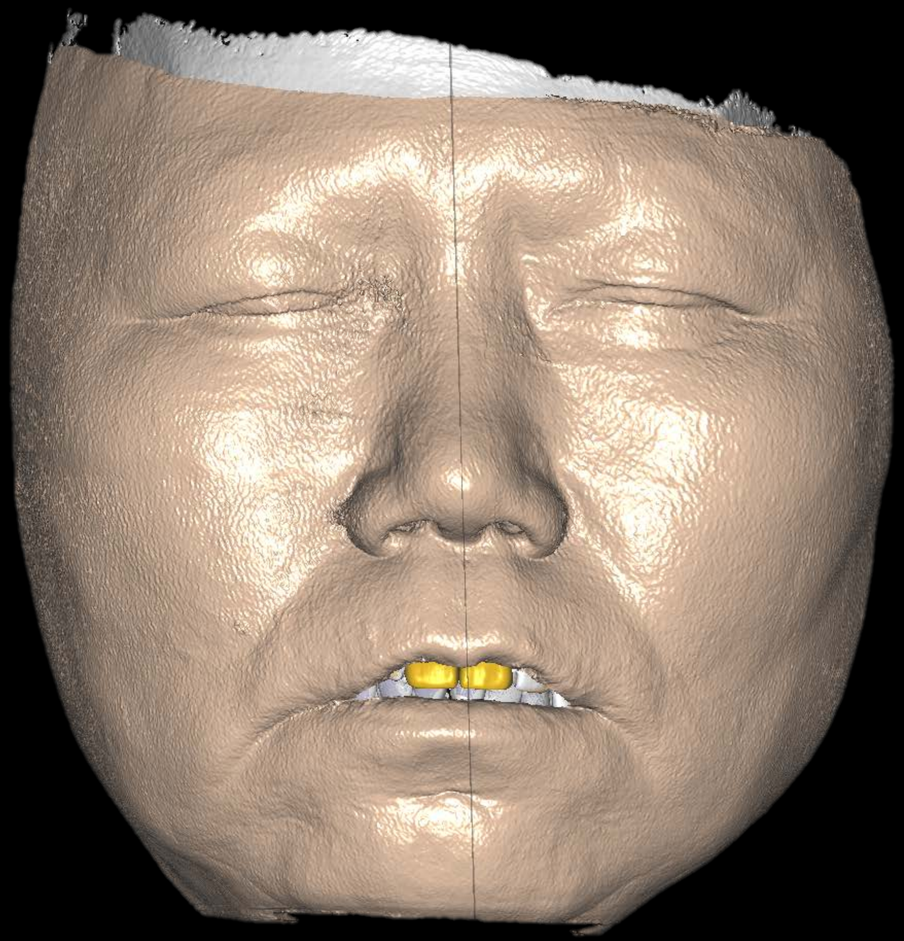
Tooth Axis & Mid Line check
with CT & working model

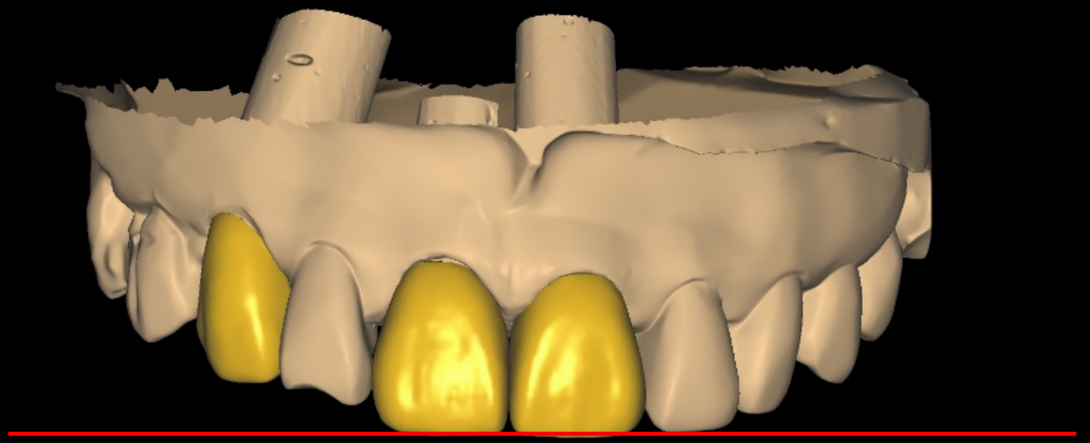


CAD (Final prosthesis)



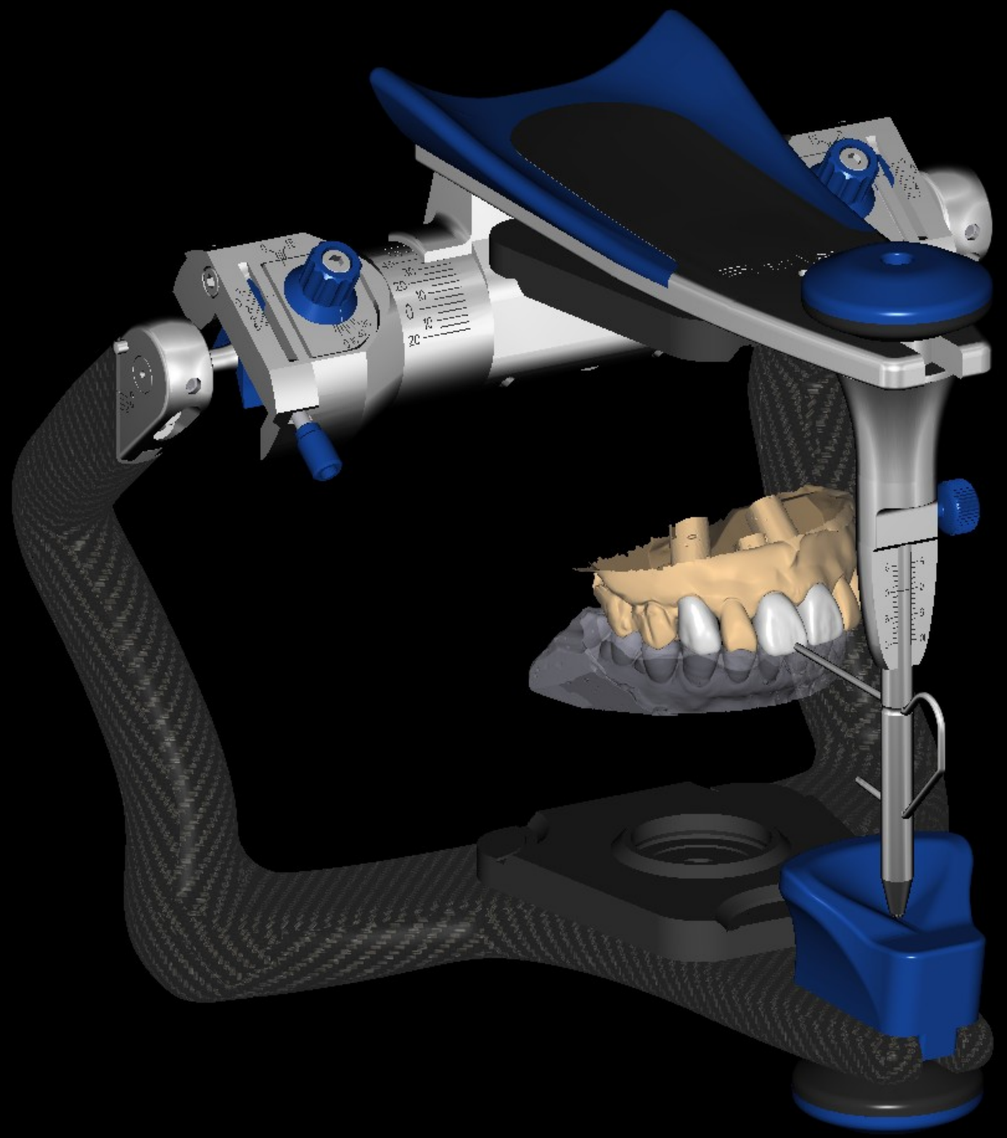
CAD (Final prosthesis)

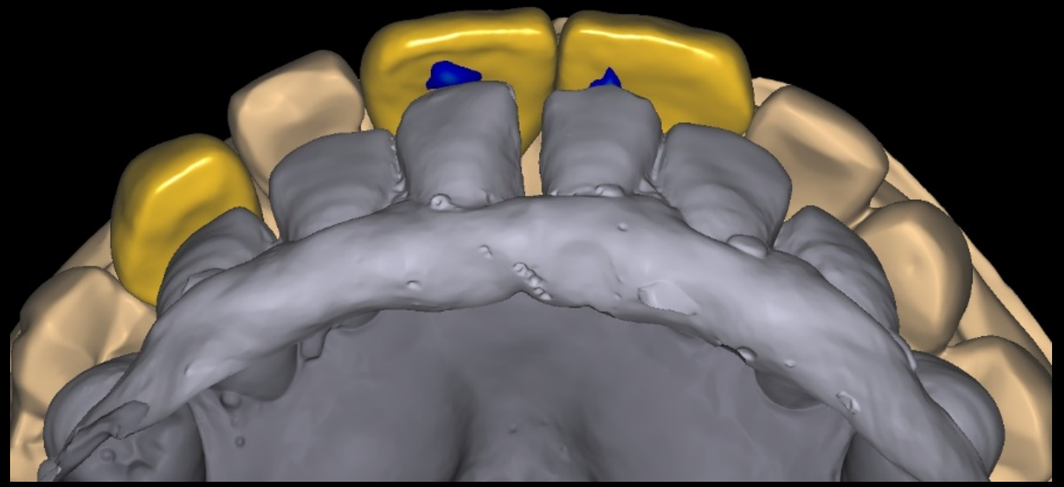


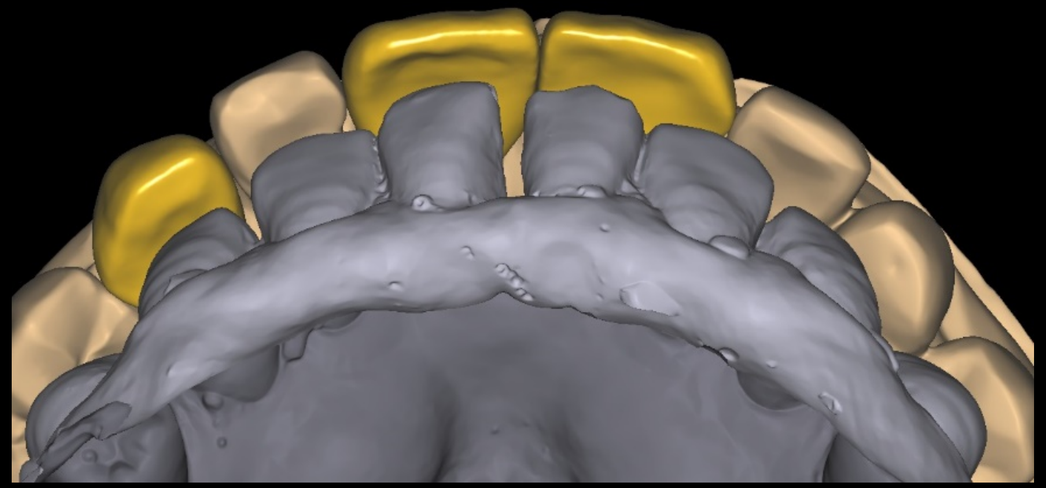


Crown length check with CT soft tissue data

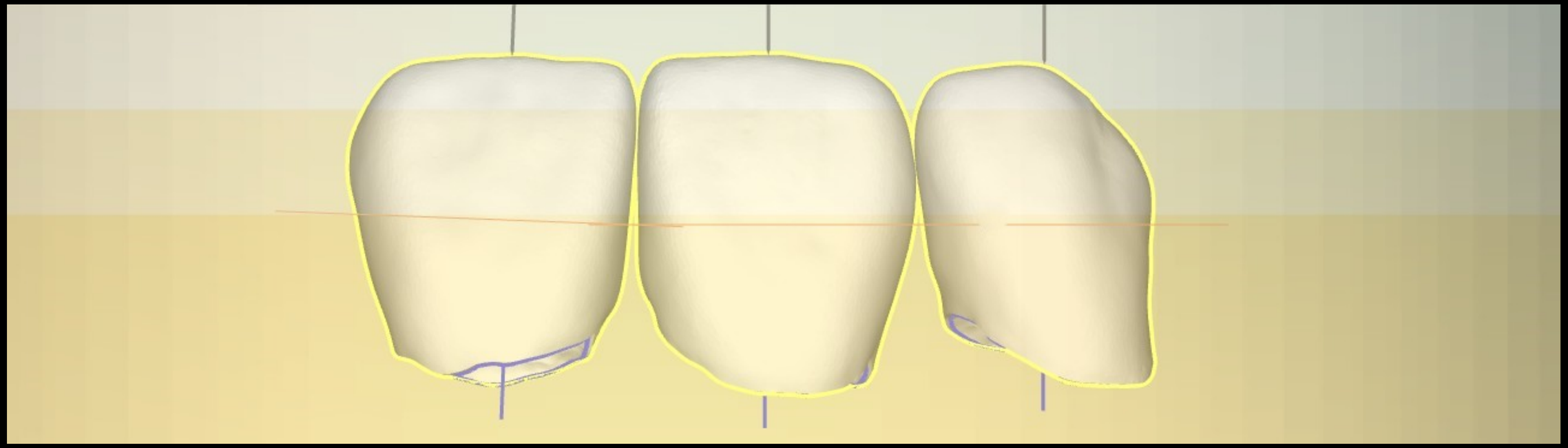
CAD : Mounting with virtual articulator







Hyper dent



18T 3 Layer Block

Milling / Coloring / Glazing

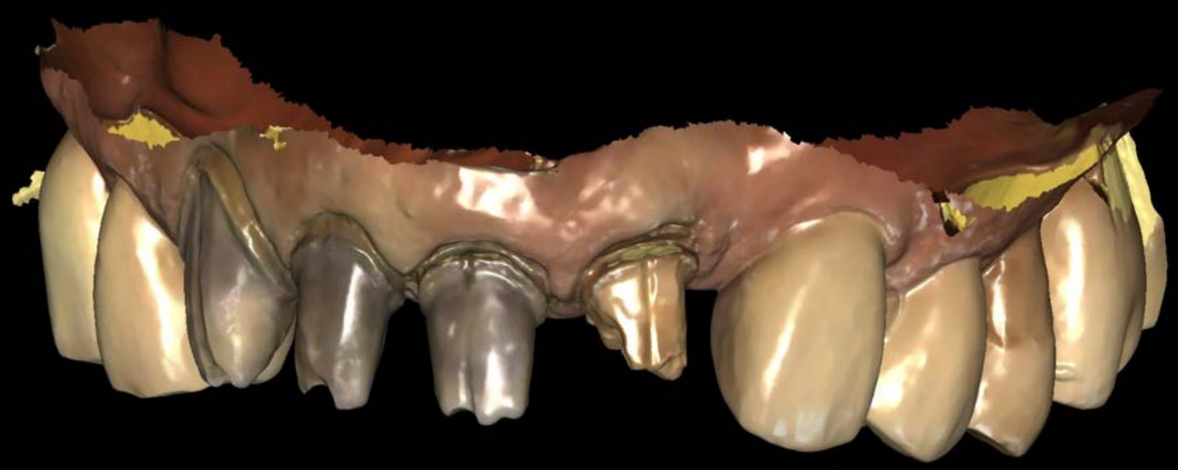
Inner – White Opauqe

Final prosthesis

Virtual Set-up

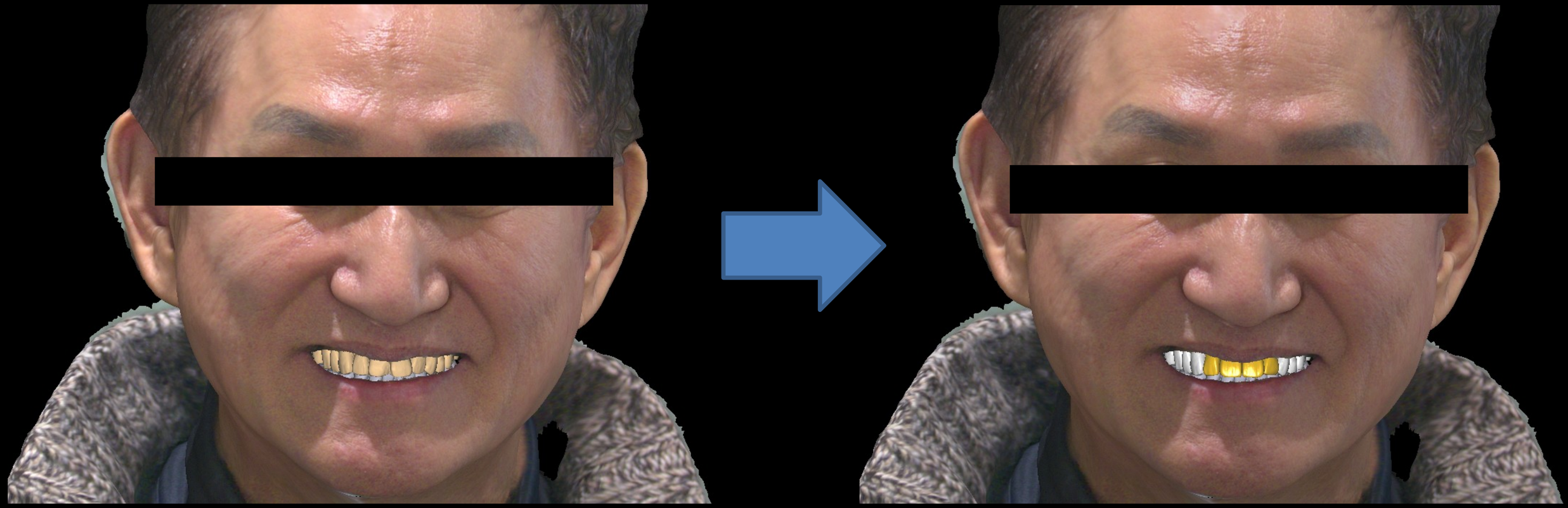
Very effective with pts commutation
Systematized approach for tx

Case report



- # 13, 12, 11, 21
- Natural Teeth
- bright 3 Layer
- Shade A3

Virtual Set-up combined with facial scanner

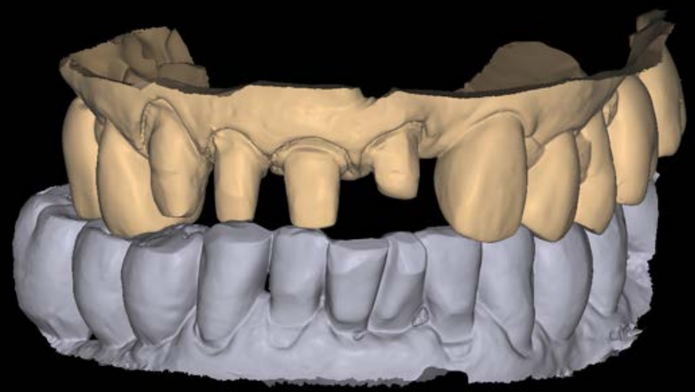


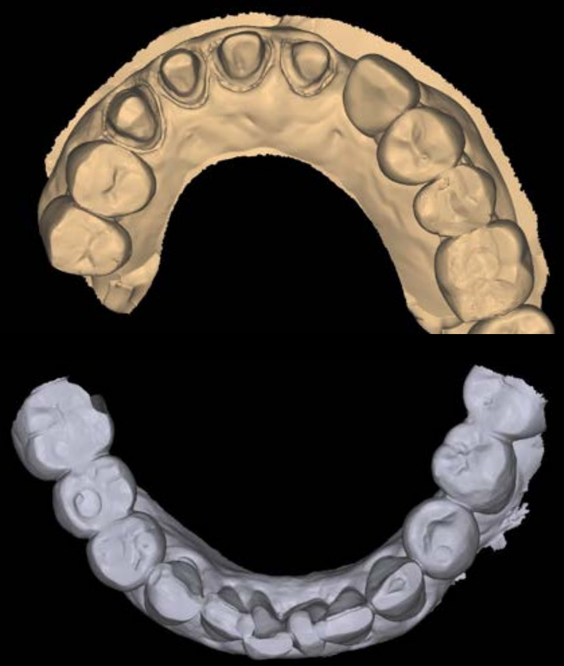
Very good with pts consulting and systemic tx

Impression scan for working model

Border Trimming

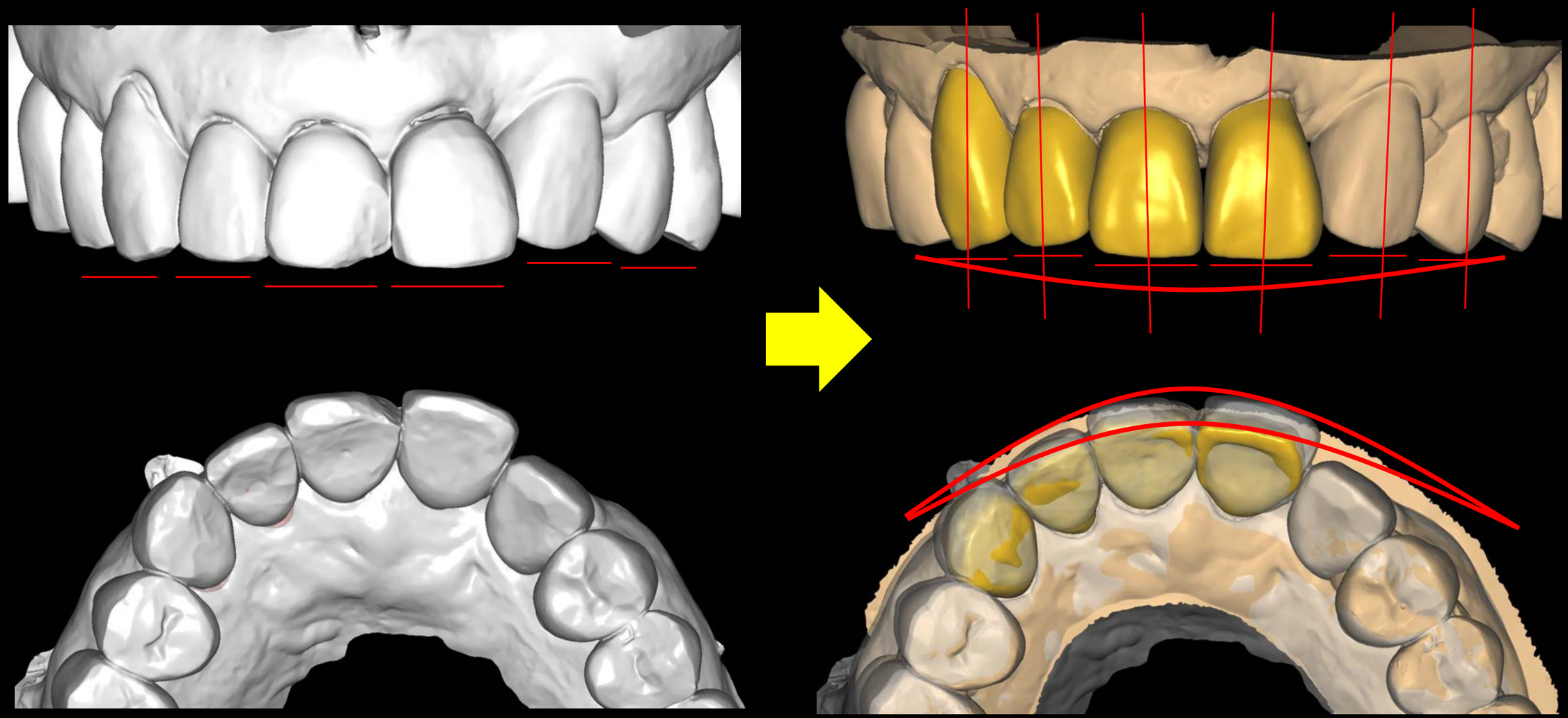
Scan spray





3) Virtual Set – up_case 1

Prosthesis design



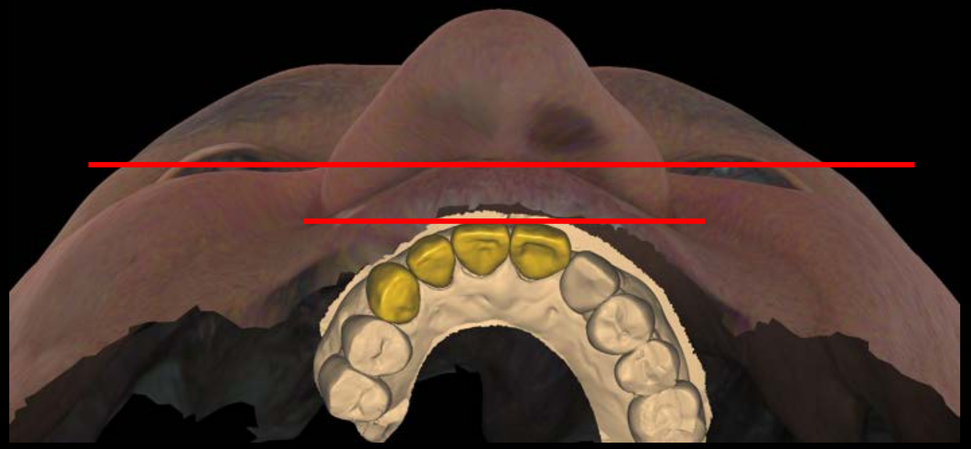
Facial scanner vs CT data application

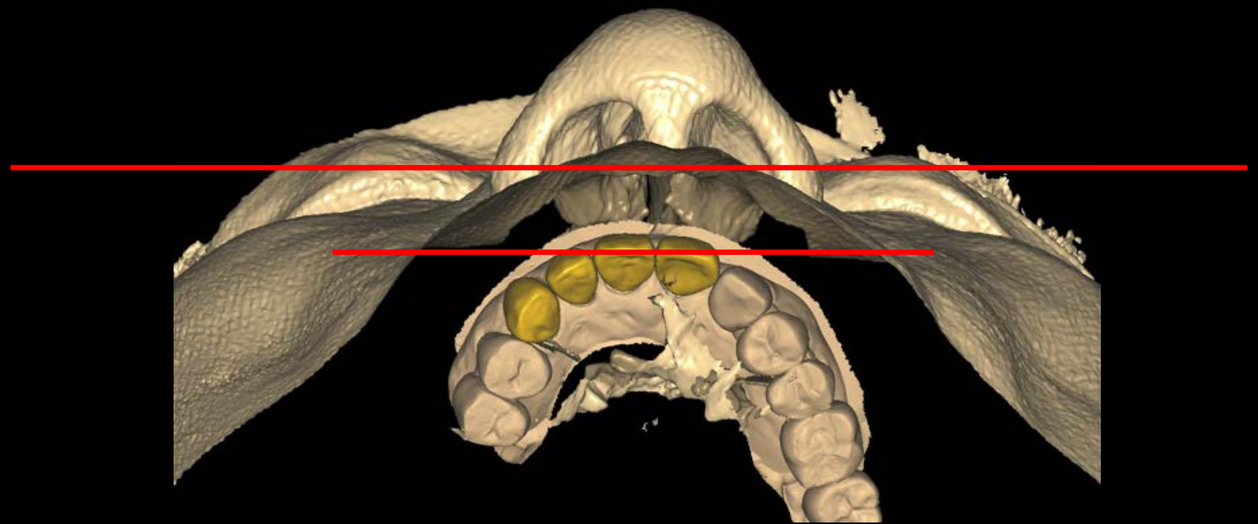
Facial scanner

Good for pts consulting

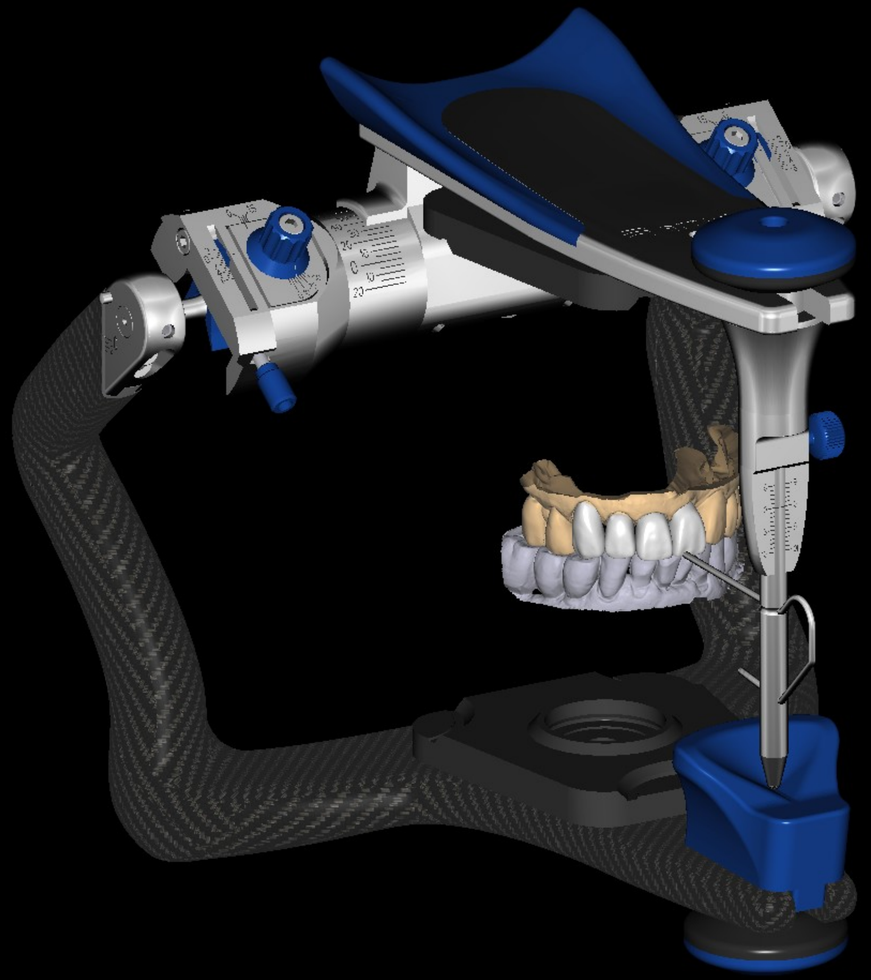
CT STL

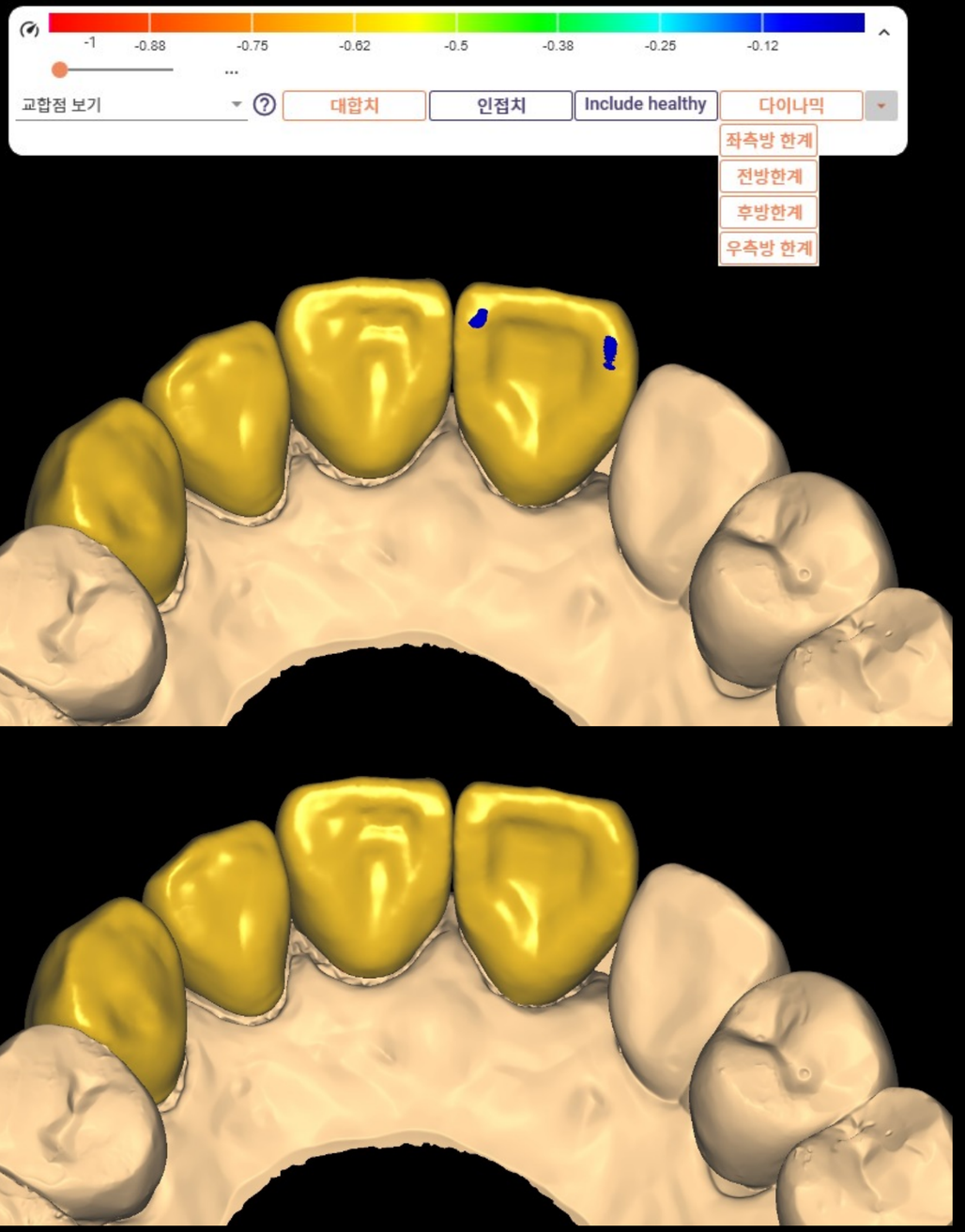
more precise for lab



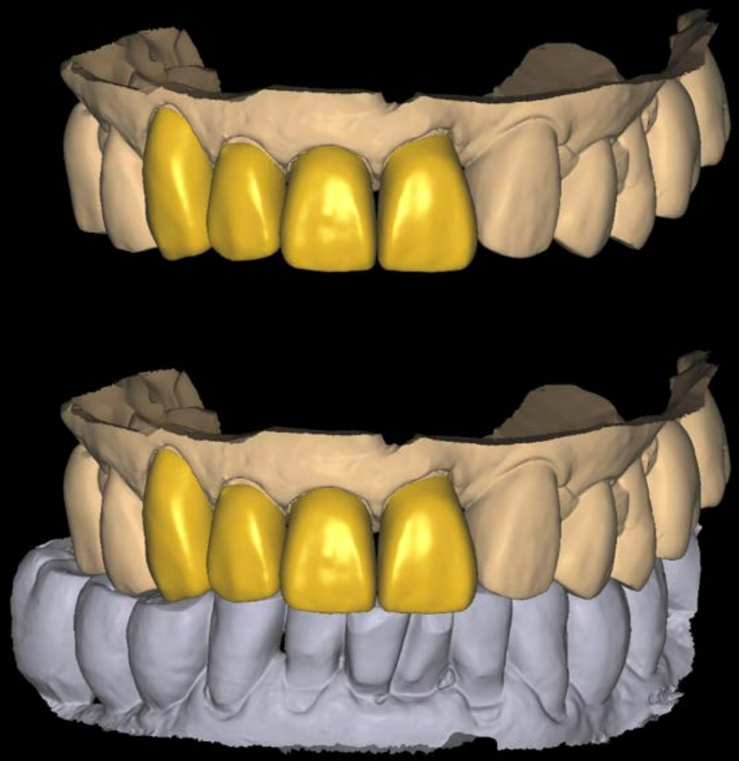


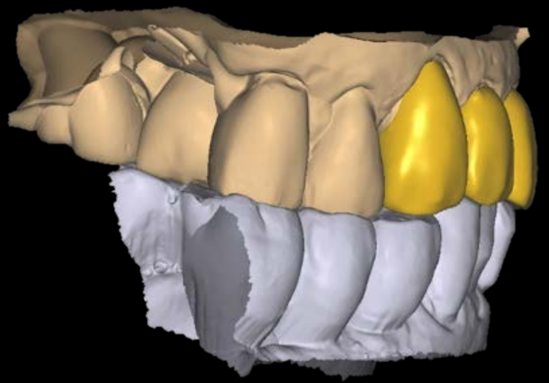
Prosthesis design



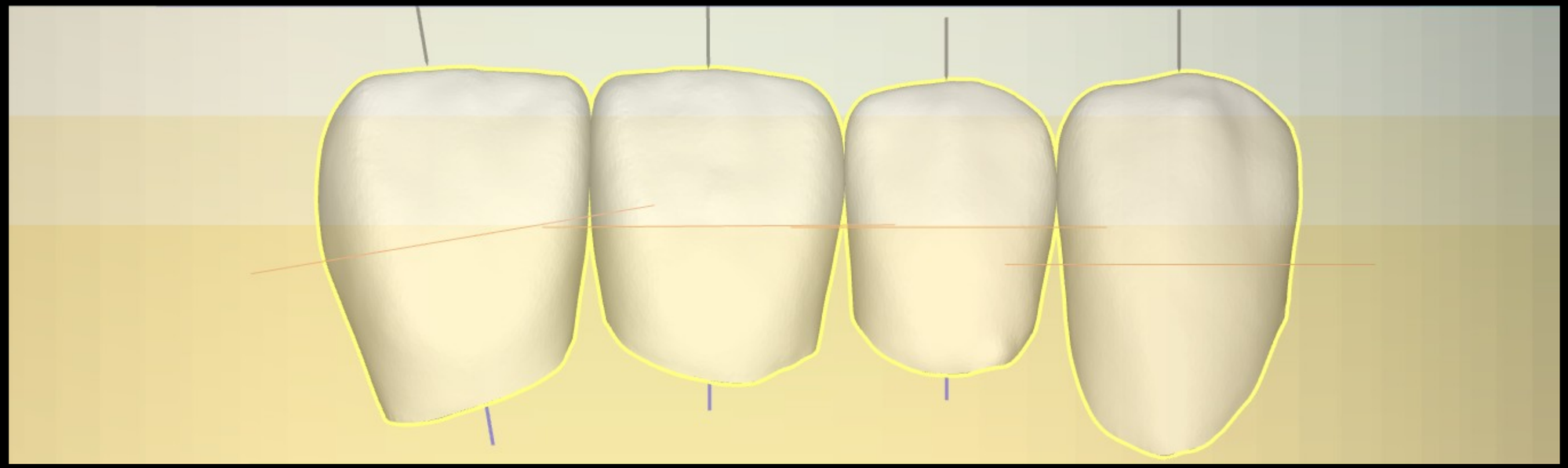


Prosthesis design





Hyper Dent



A3 18T 3 Layer Block

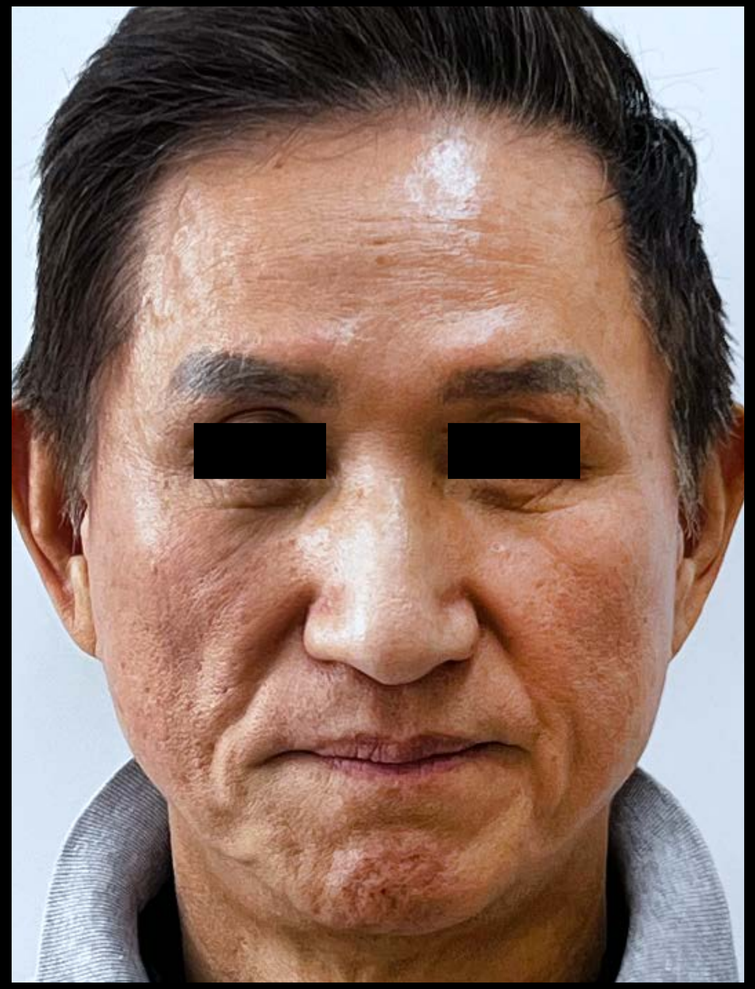
Coloring

Inner – White Opaque

Prosthesis design

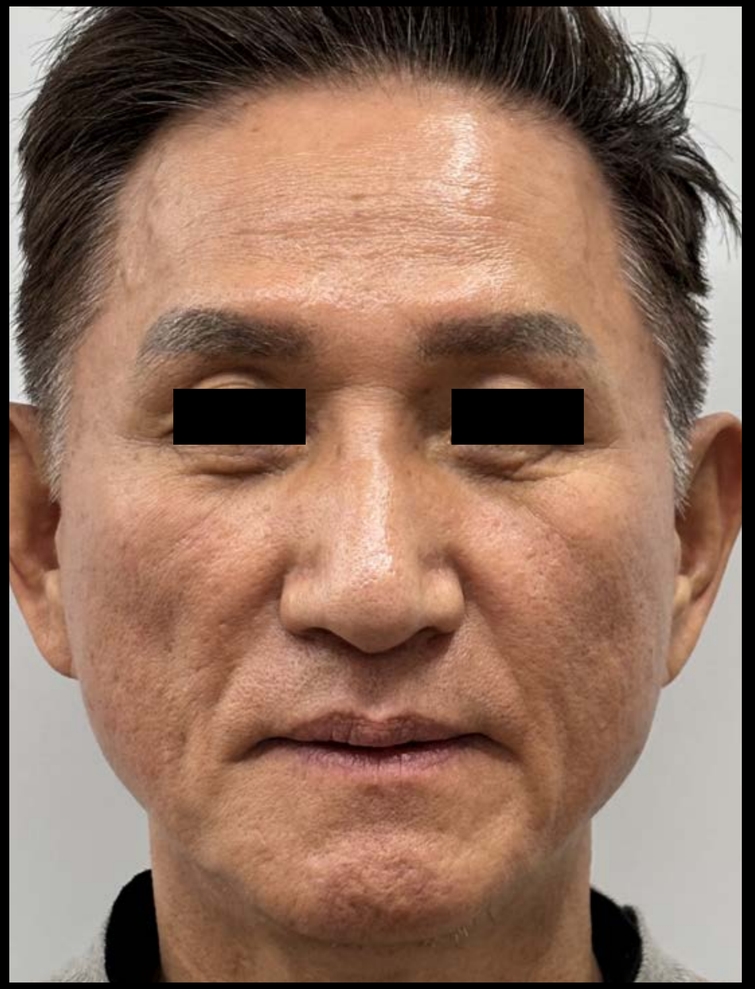
bright 3 Layer A3

Before

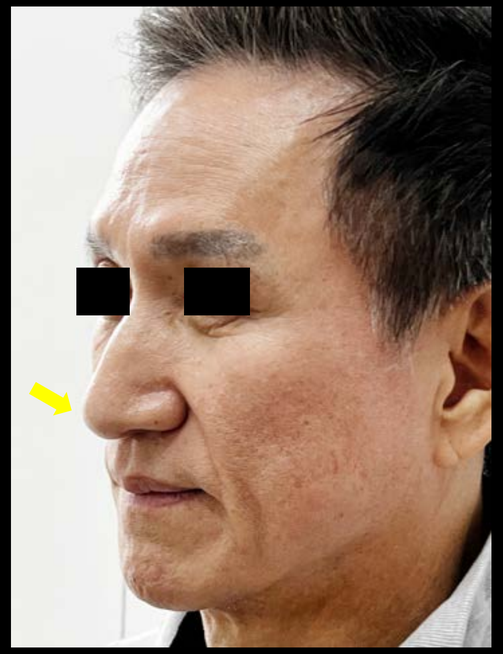


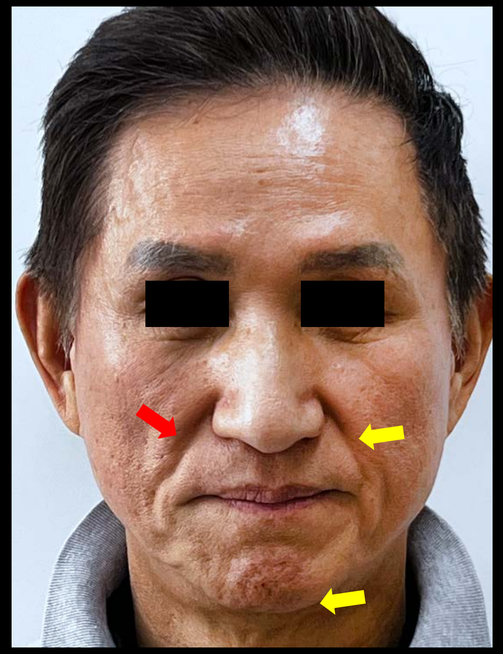
After

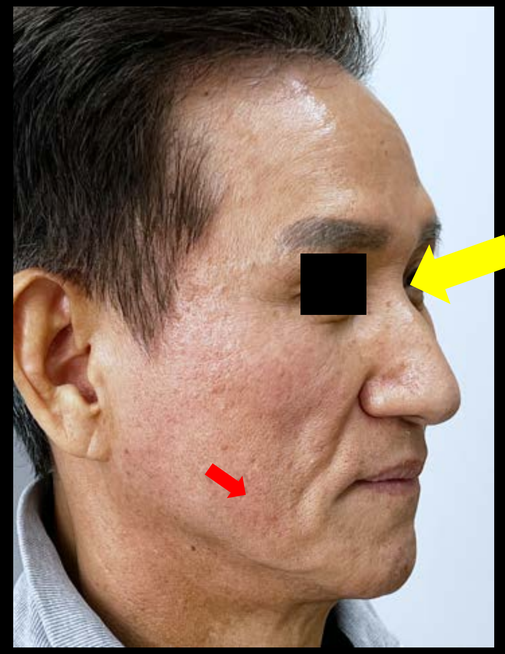
1 Month Later



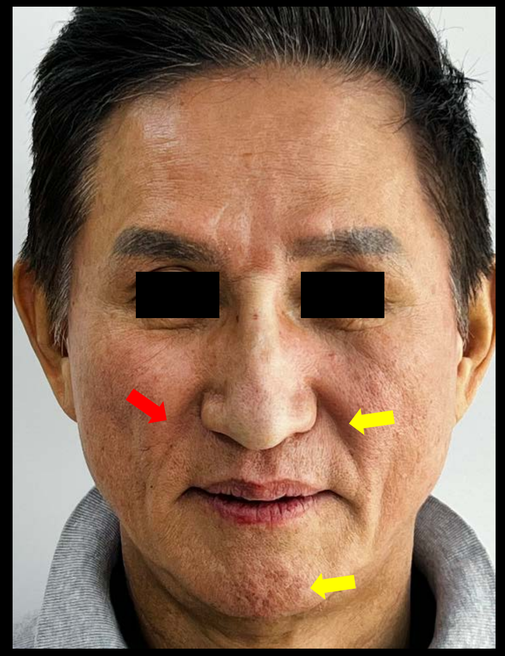
before

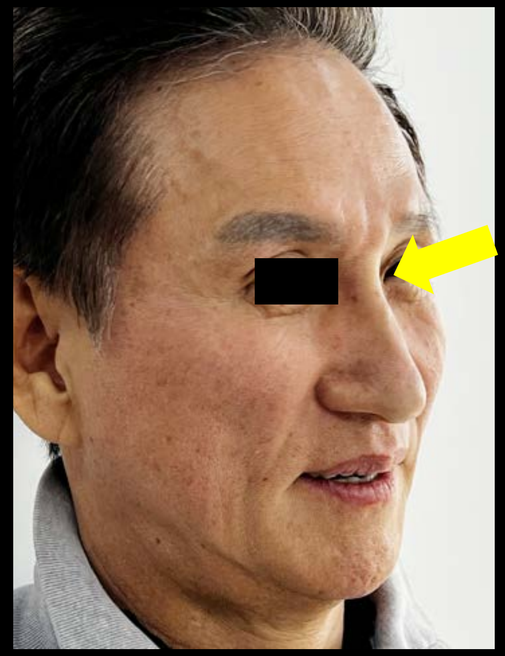






after





application site

High
- Nose
- Nasolabial folds
- Chin

Smile
- Nasolabial folds
- Marionette lines

High elastic hyaluronic acid filler

The way to overcome Barriers of digital

Cost for investment for facial scanner and CT
Inaccuracy with IOS
Knowledge of material development
Too much information and too less total education
No turn key suggestion with practices

Contents

BTS
Diverse applications of CT viewers
Zirconia block
Auxiliary

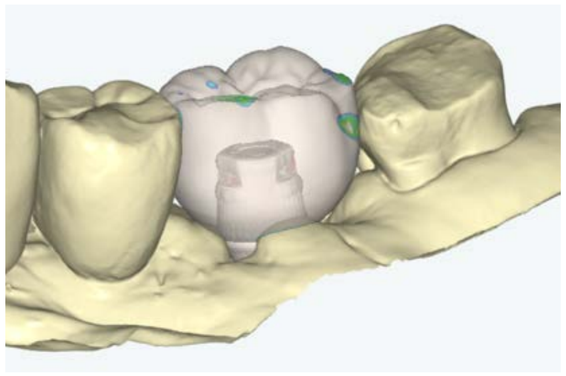
Crown Guide

Dentium

Surgical Guide

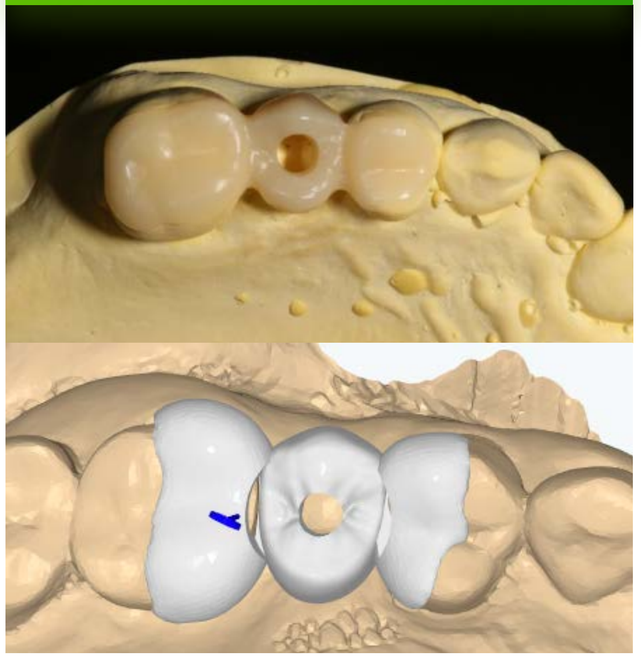
+

Crown



Crown Guide

Top-down design
Minimalism

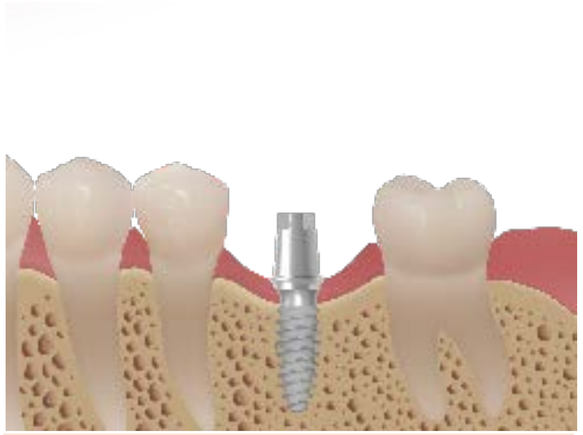


Digital Minimalism : Crown guide

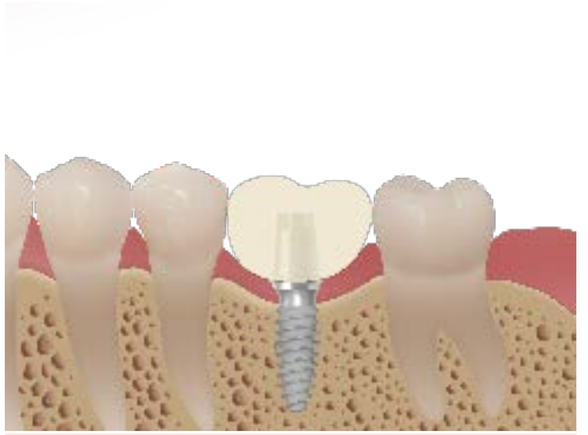
무엇을! 어떻게!

adaptation

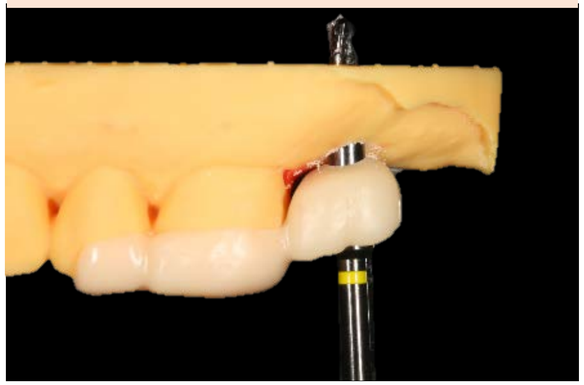
drilling

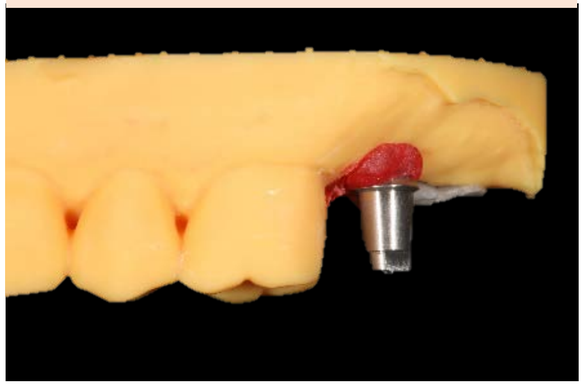


implantation



delivery



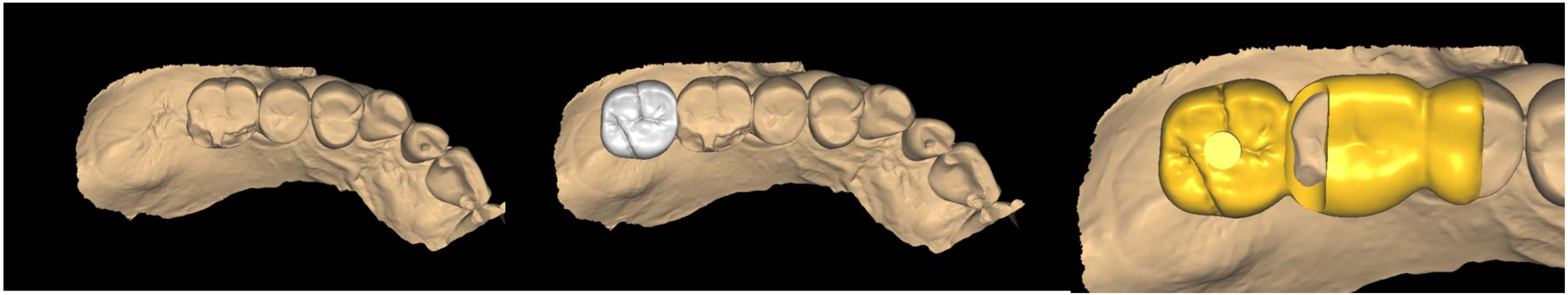


Digital Minimalism : Crown guide

무엇을! 어떻게!

Case 2_#17

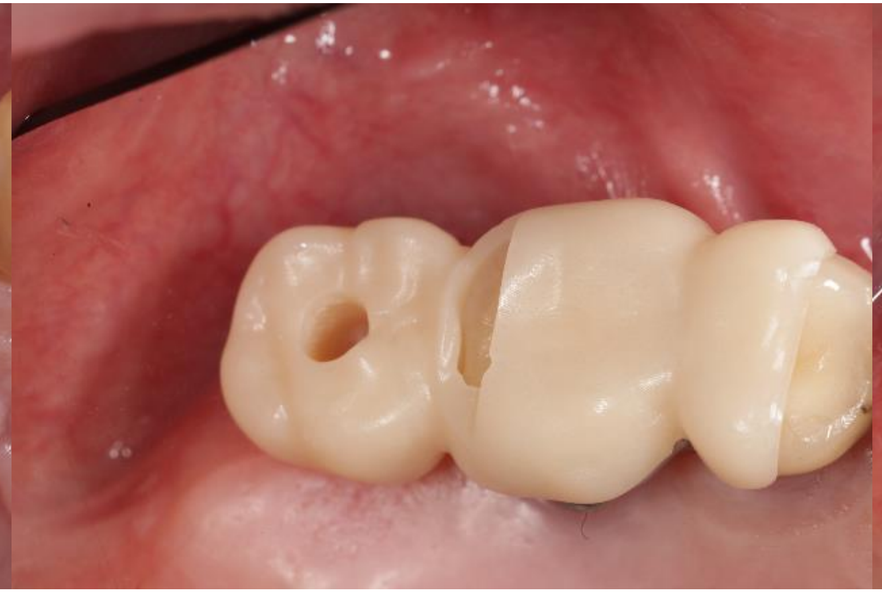
제작과정



Digital Minimalism : Crown guide

무엇을! 어떻게!

Case 2_#17

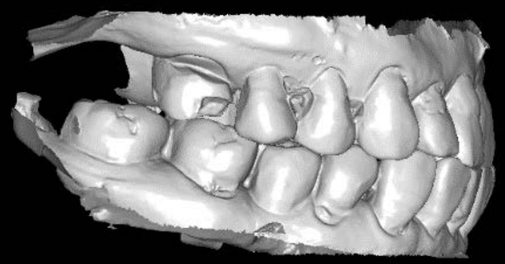


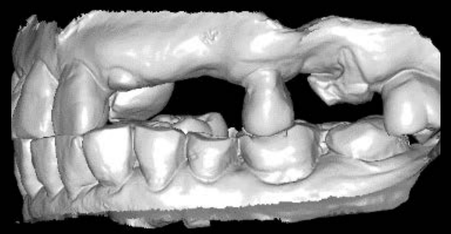
Pre-op(2024-03-06)

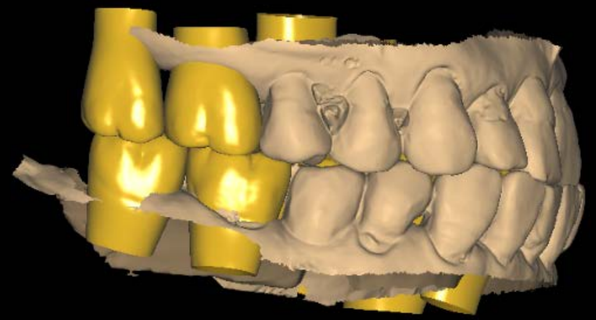
Oral exam (2024-02-21)

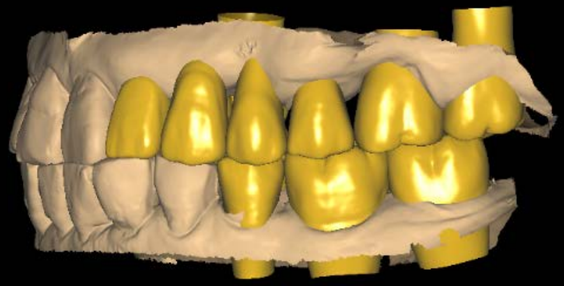
Virtual Set up

Virtual Set up

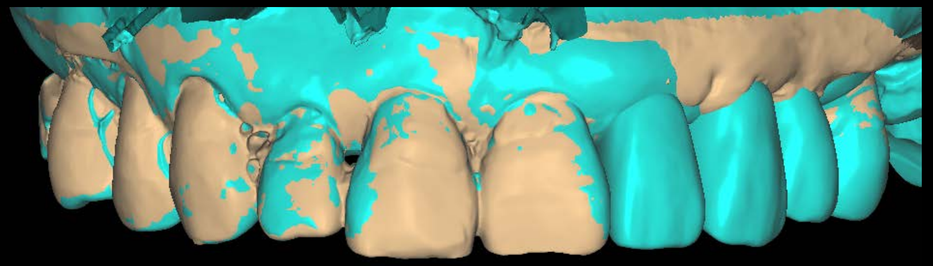


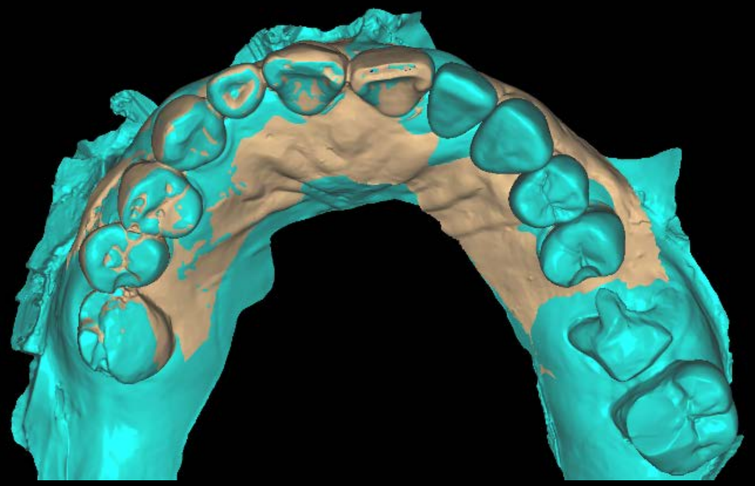


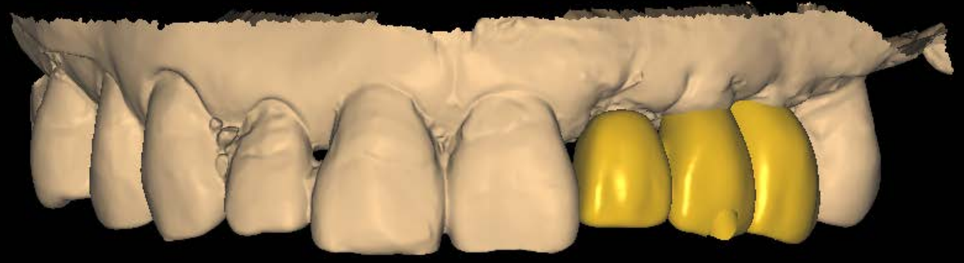


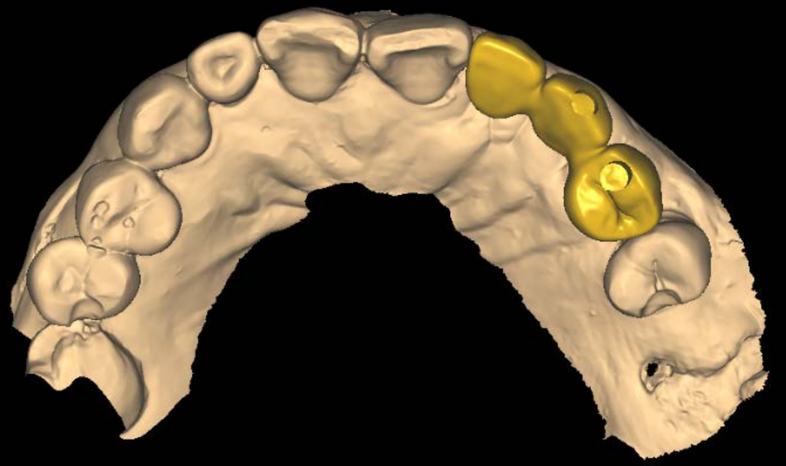


Cad Design





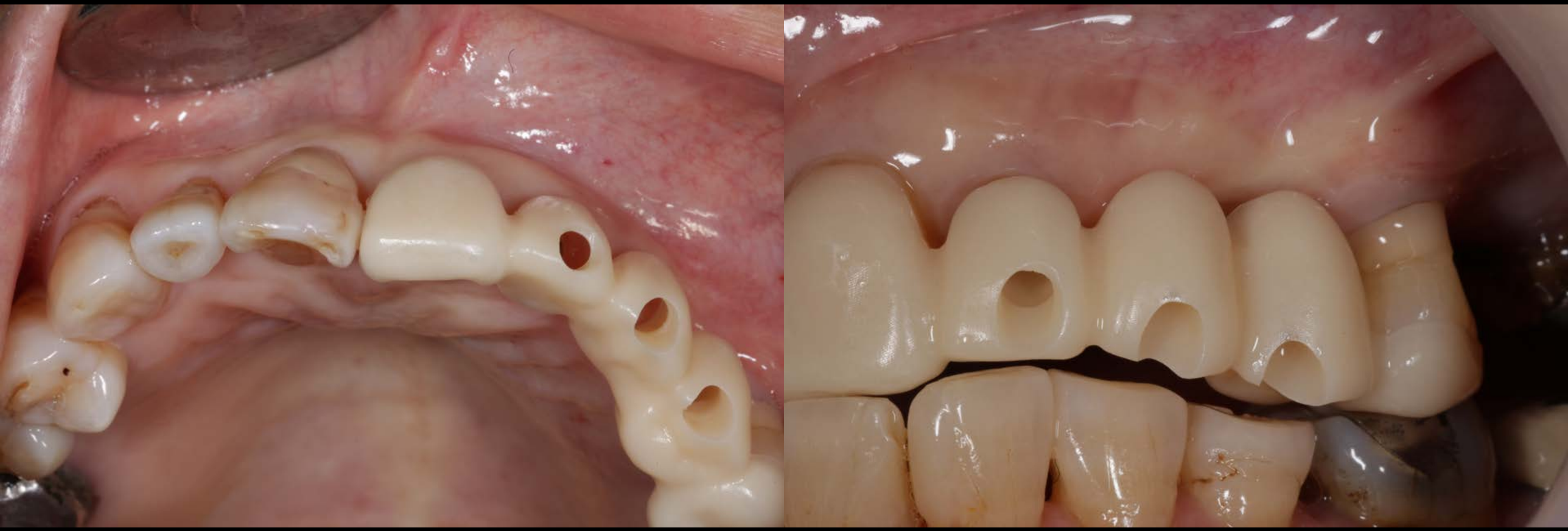




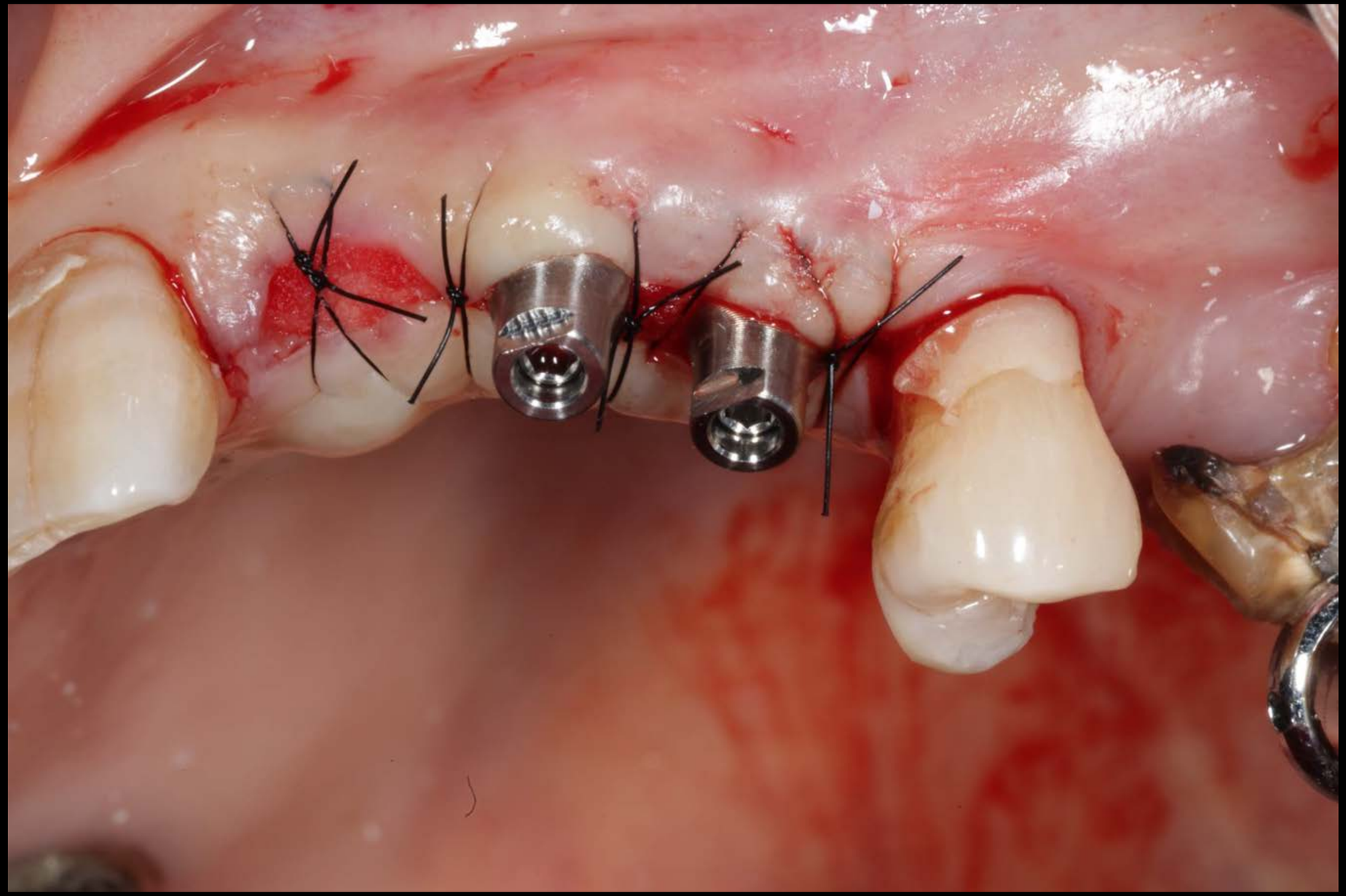
Final Prosthesis

Pre-op(2024-03-06)

Crown guide adaptation (2024-03-06)



Post-op (2024-03-06)



Resin splinting (2024-03-08)

Bright Universal Etchant

Bright Bond Universal

Bright High flow resin

Bright Low flow resin

Provisional restoration (2024-03-08)

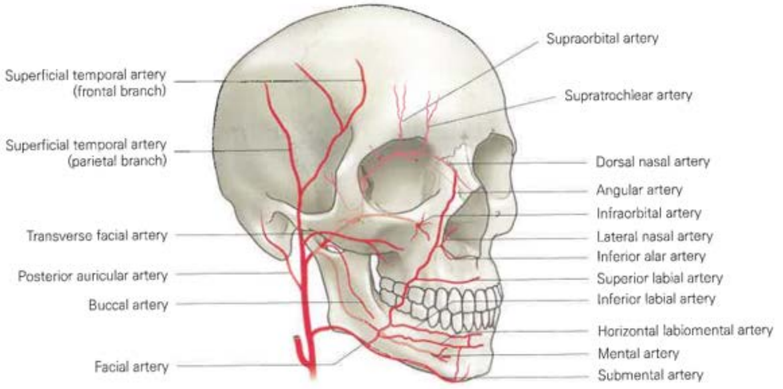
MONALISA Lidocaine

Hyaluronic Acid Dermal Filler with Lidocaine

MONALISA

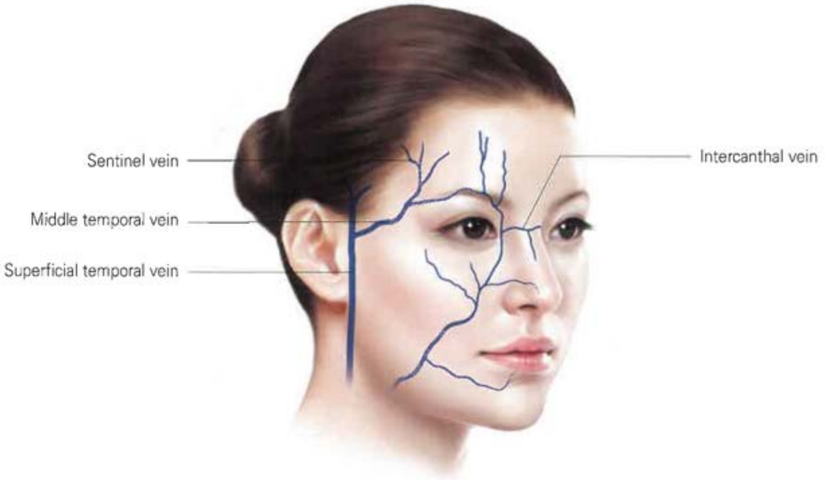
Product	SMILE	HIGH ELASTIC
Form	No impurities, transparent and colorless gel	
Components	Cross-linked hyaluronic acid, 0.3% Lidocaine	
HA Concentration	24 mg/mL	
Particle Size	400 µm	900 µm
Volume	1.0 mL	
Application	Superficial dermis / Middle layer of subcutis	Deep to very deep layer of subcutis
Needle size	27 GTW*	25 GTW*
Storage Temperature	2 ~ 25 °C	

** TW : Thin wall*

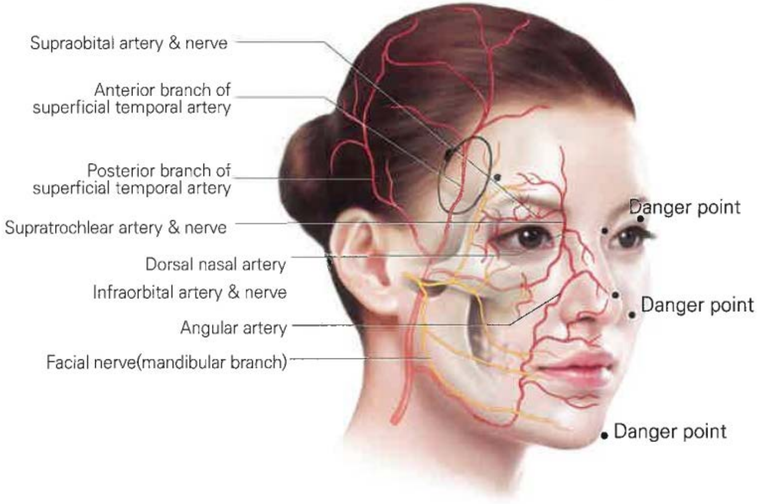


▲ Arterial branches of face

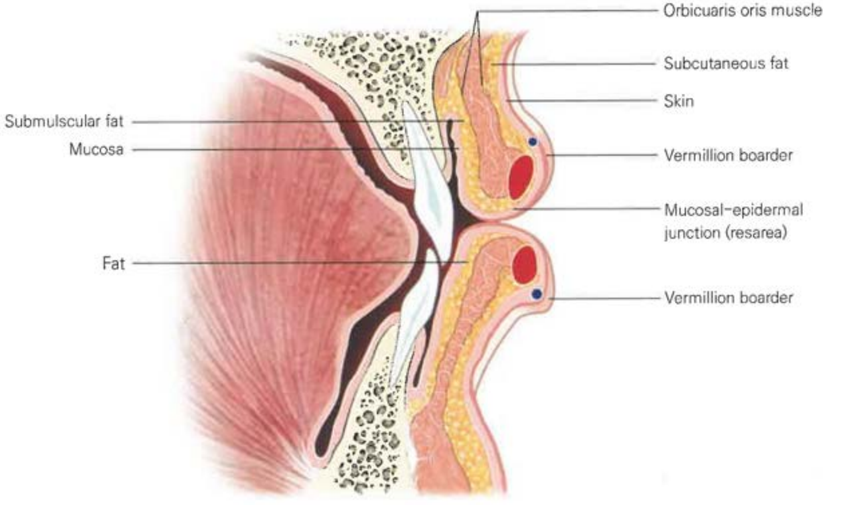
▲ Arteries supplying facial regions



▲ Veins of face



▲ The blood supply of lateral forehead area



▲ Sagittal section of the lip

Hyaluronic Acid Dermal Filler with Lidocaine

MONALISA

Safe filler

Natural image filler injection

Mutilayer

- bone contact
- just below the dermis

Hyaluronic Acid Dermal Filler with Lidocaine

MONALISA

25G Needle

25G Needle / 23G Cannula

Application site

Bone contact touch (Deep fatty layer)

- Long-lasting
- Deep wrinkle improvement

Superficial skin (Superficial fatty layer)

- maintain a natural and smooth appearance
- low invasiveness

Clinical case : Nasolabial folds & Marionette Line & Lip

Before

After

Before & After

Before & After

Appreciate
For attending doctors
and staffs for helping