SURGICAL GUIDE DESIGN

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Postgraduate Dental College

THE SPEAKERS HAVE NO CONFLICTS OF INTEREST RELATED TO THIS PRESENTATION.

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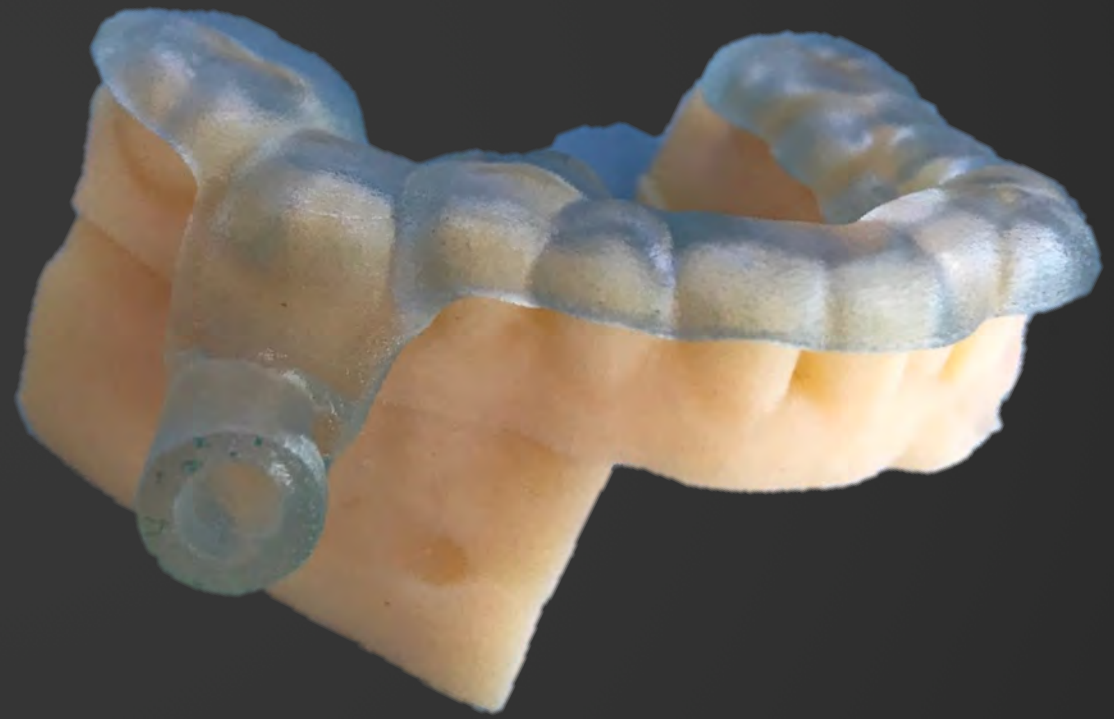
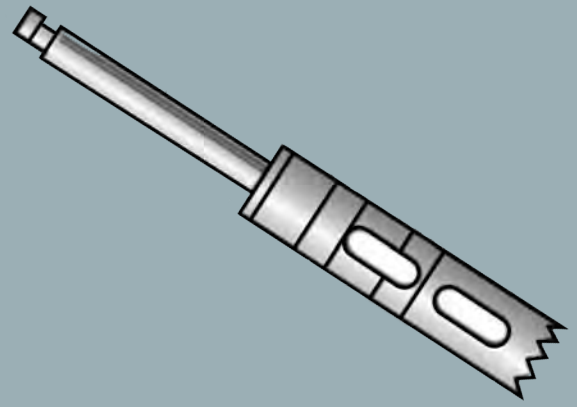
UNIFORMED SERVICES UNIVERSITY
of the Health Sciences

HOW DO I GET STARTED?





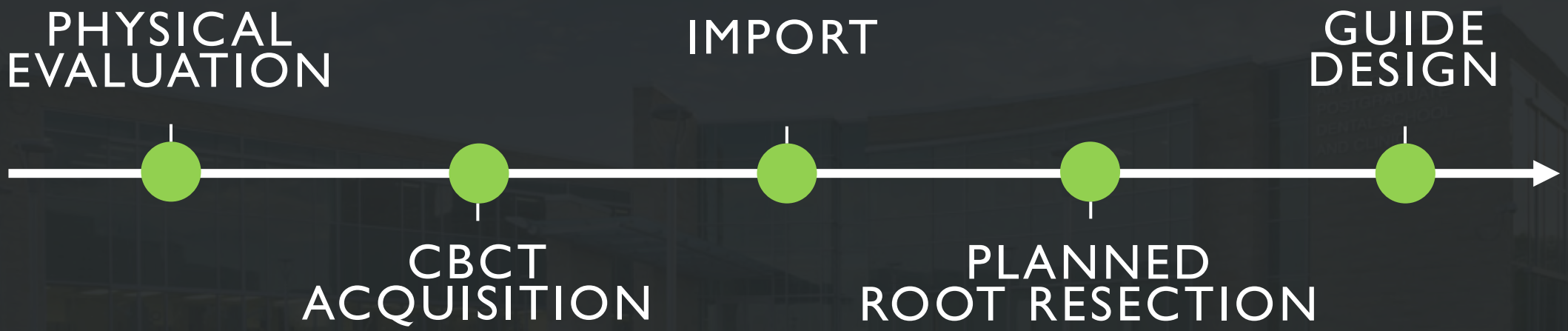
Patient CBCT

4 Essentials

Digital Design Software
(Blue Sky Plan)

Digital Model

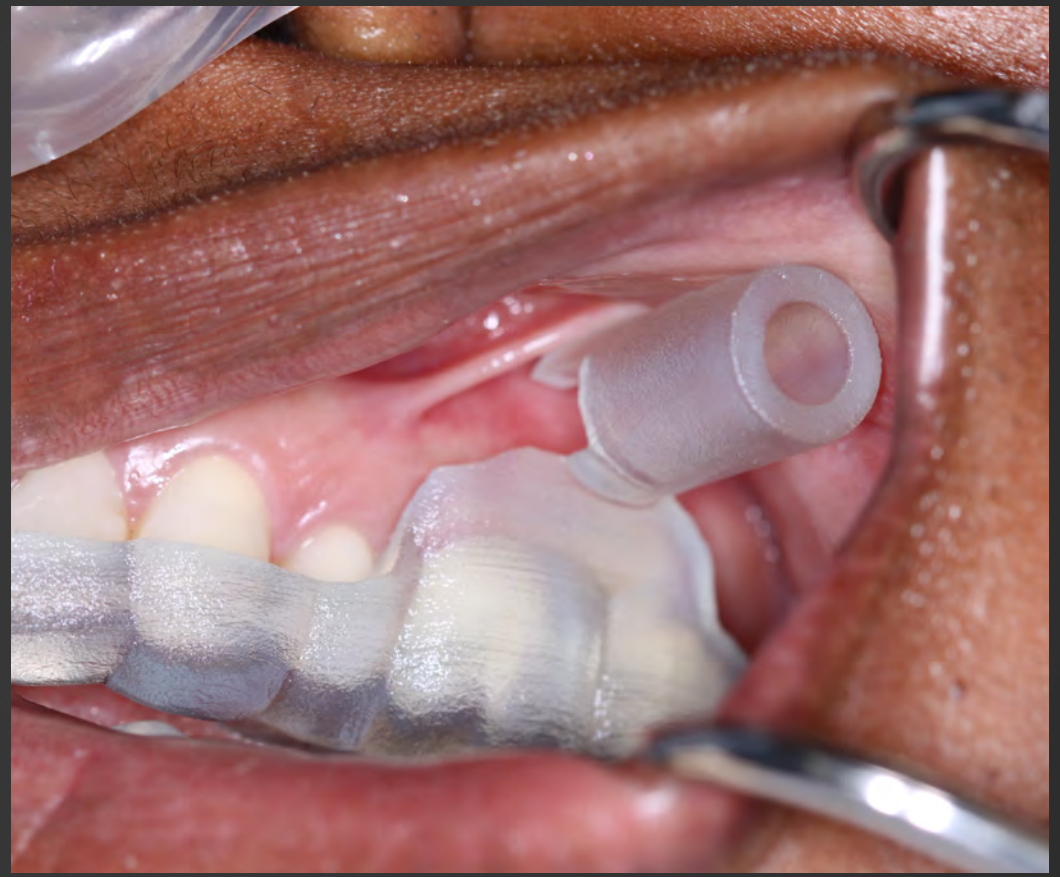
PROCESS


PHYSICAL EVALUATION
CBCT ACQUISITION
IMPORT
PLANNED ROOT RESECTION
GUIDE DESIGN

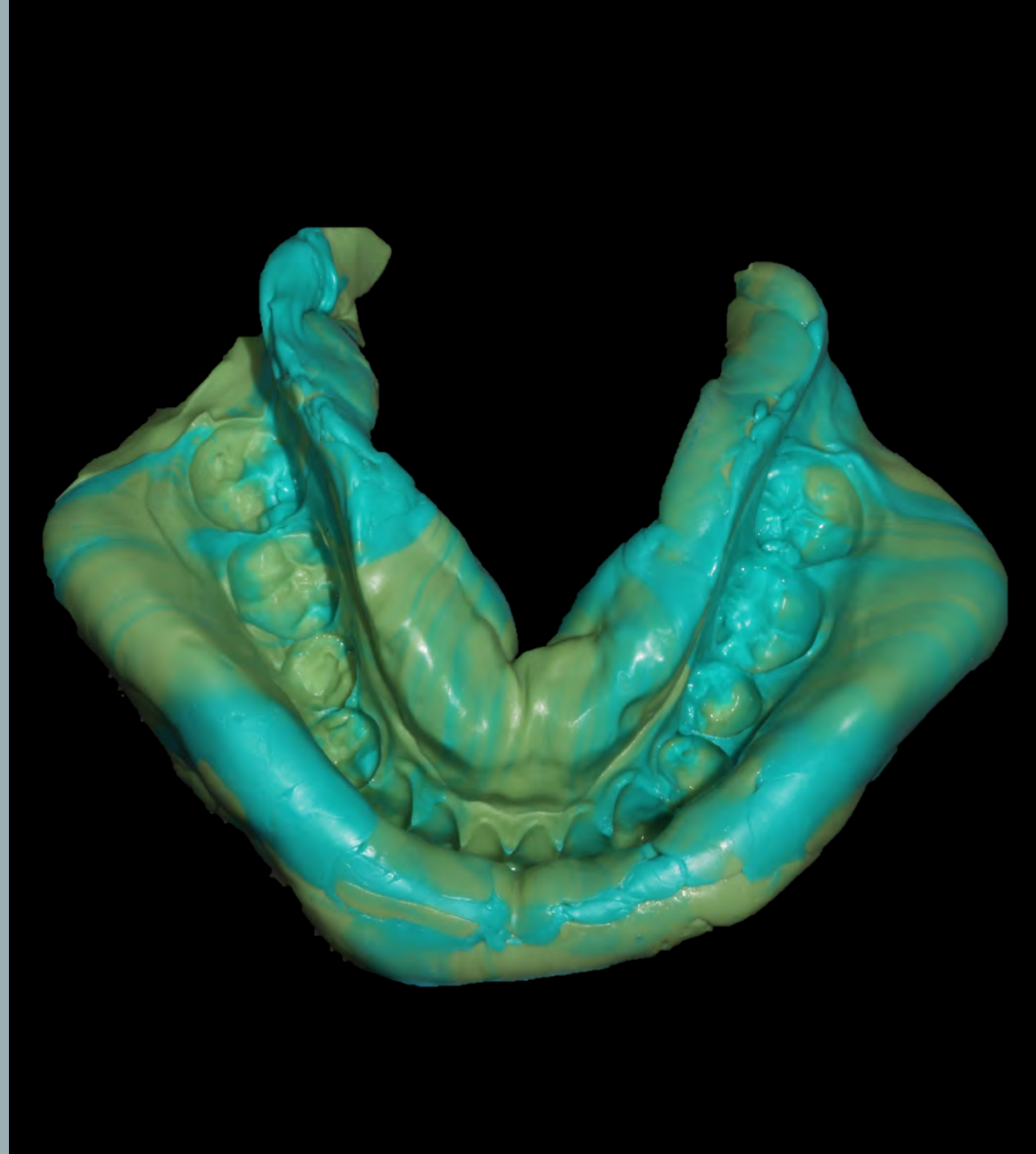
PHYSICAL EVALUATION

CLINICAL EXAM

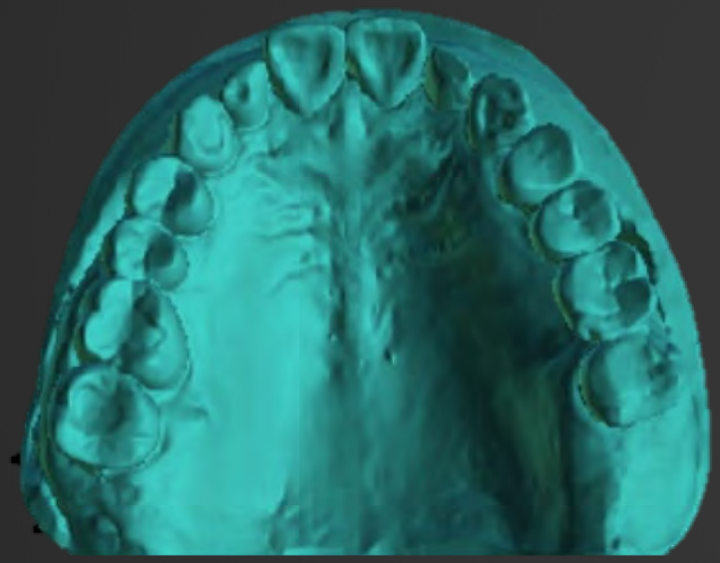
- Size of mouth
- Pliability of cheeks/lips
- Arch & palatal vault
- Depth of vestibule compared to root apices

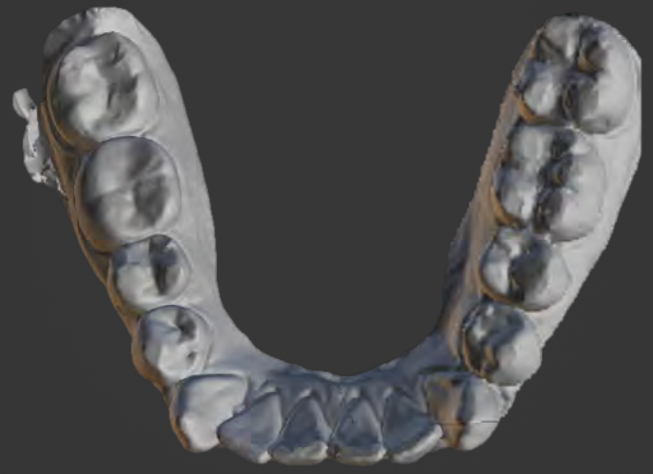


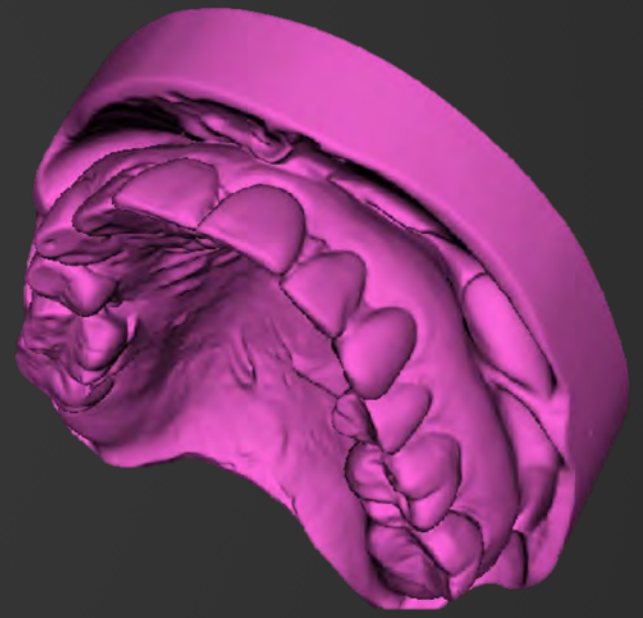
MAKING A GOOD IMPRESSION

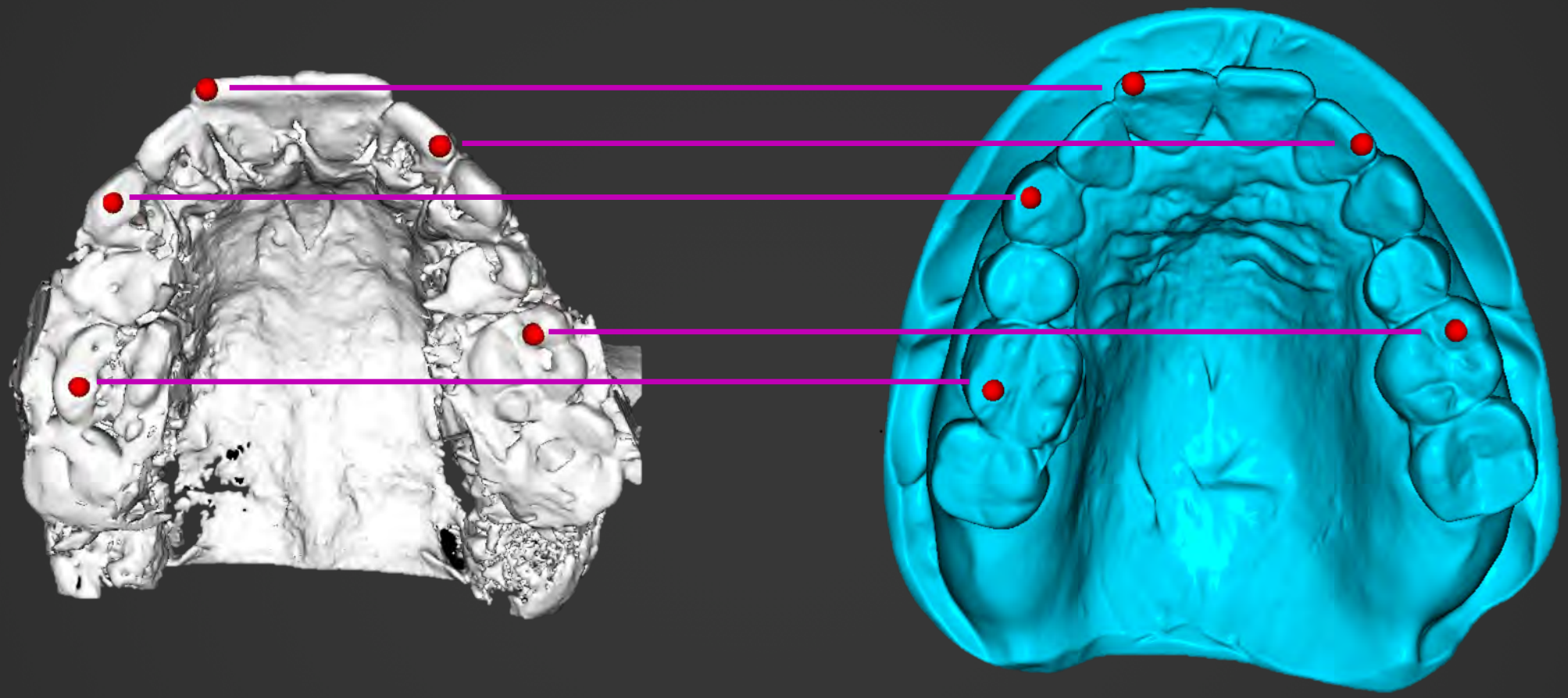


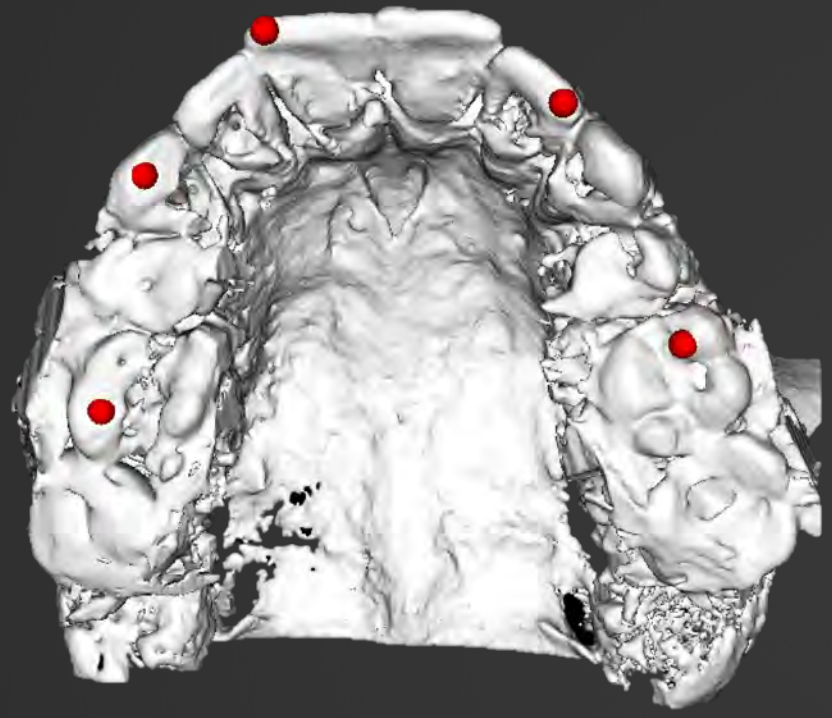
DIGITAL MODEL

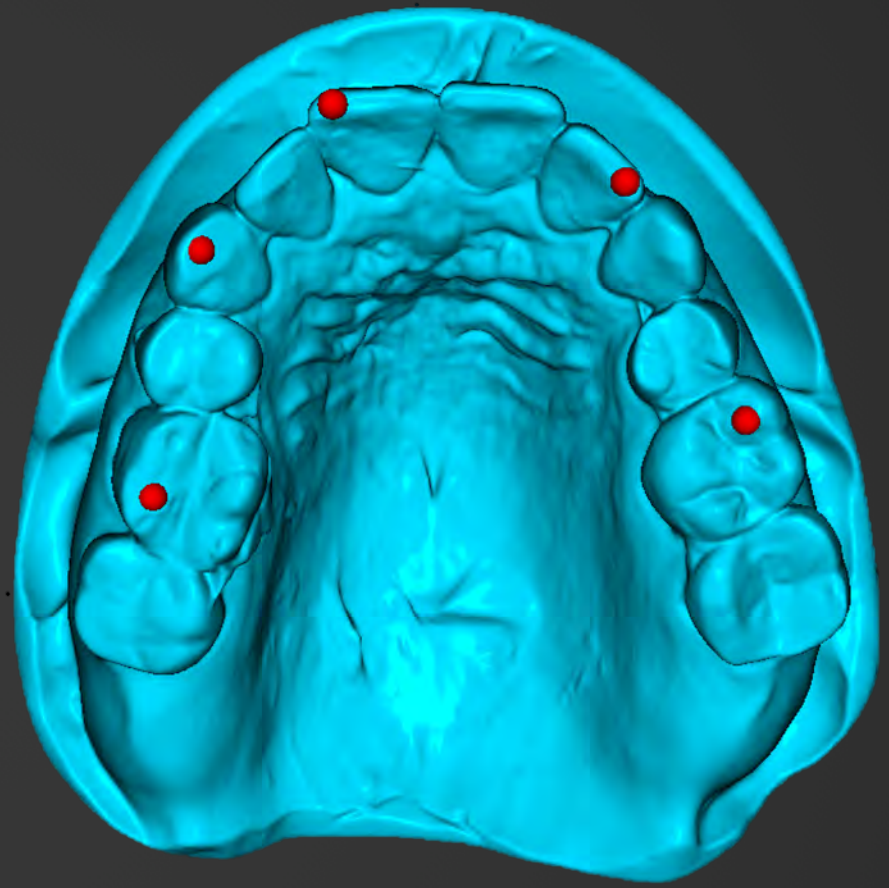


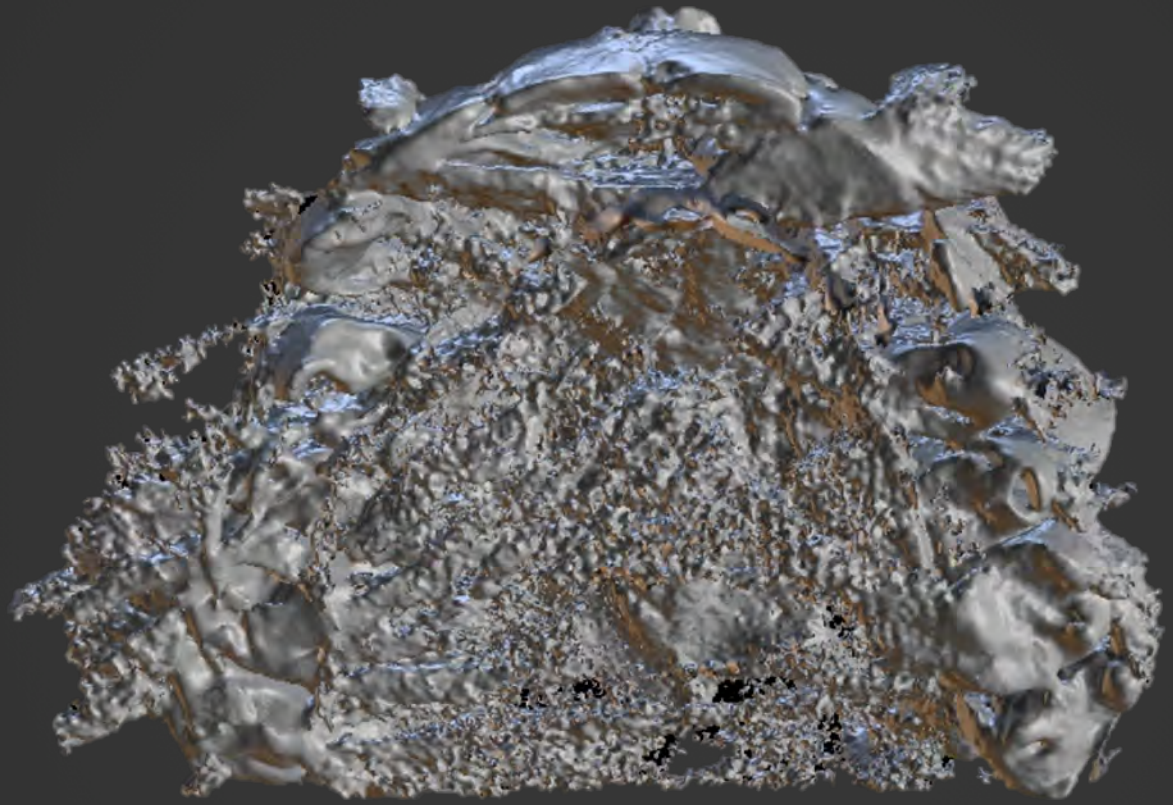


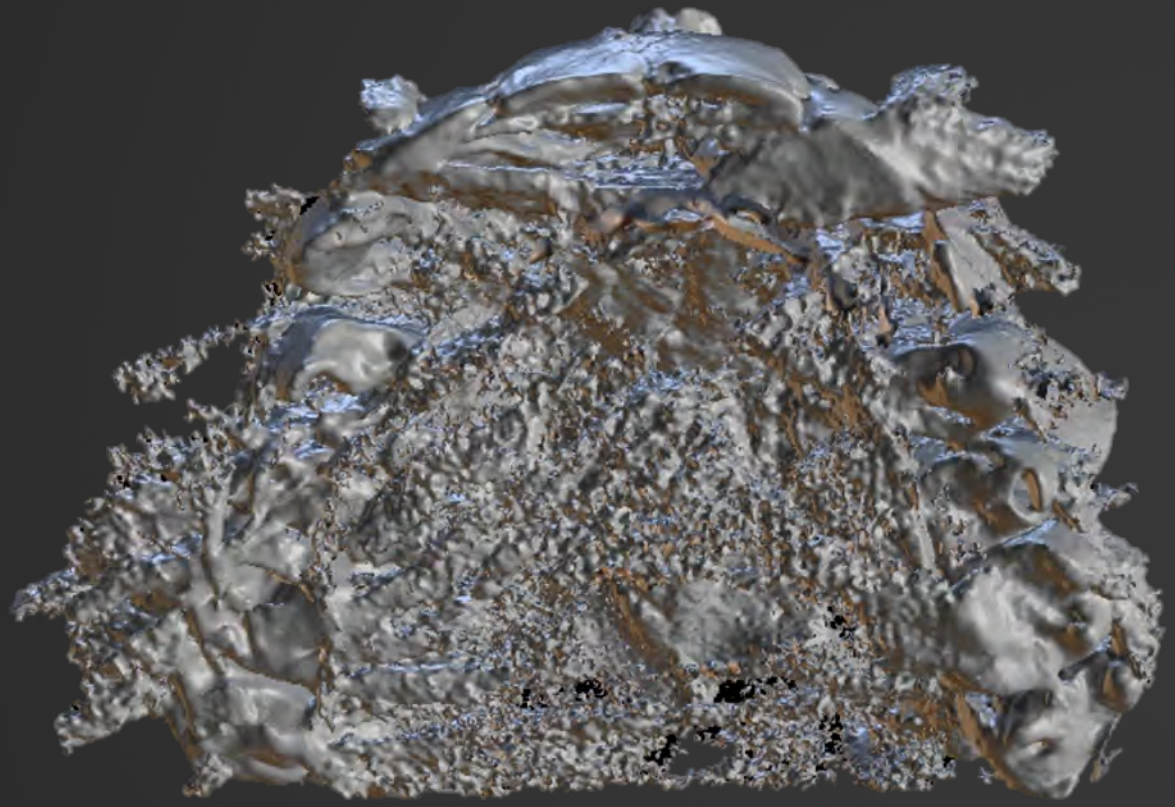


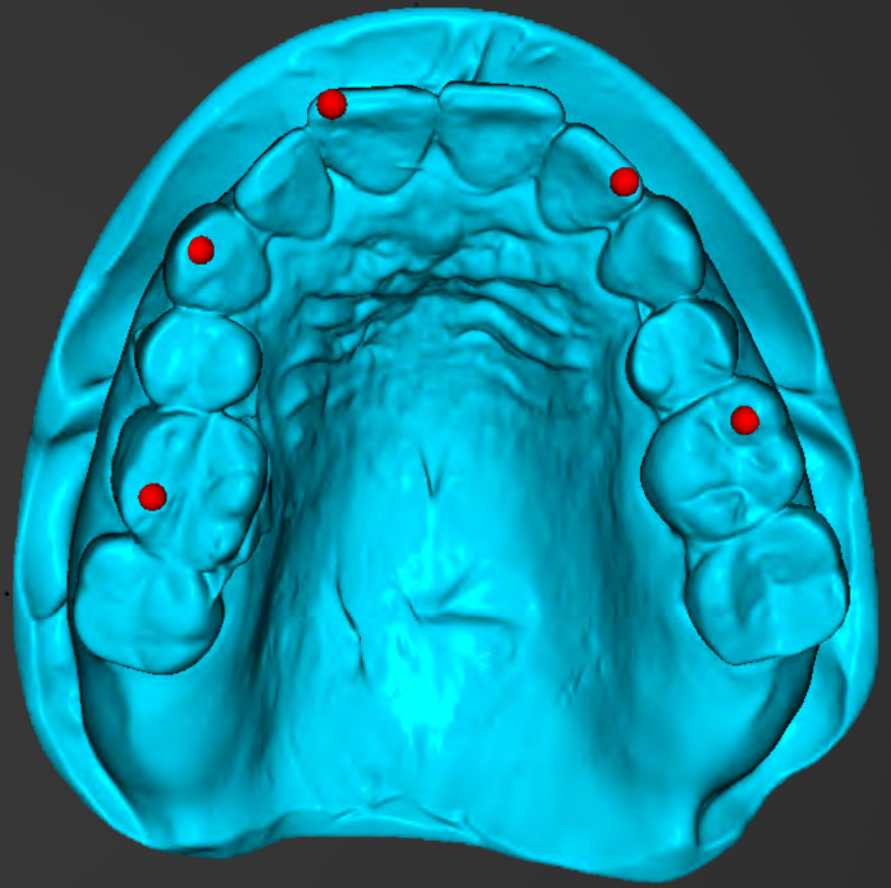




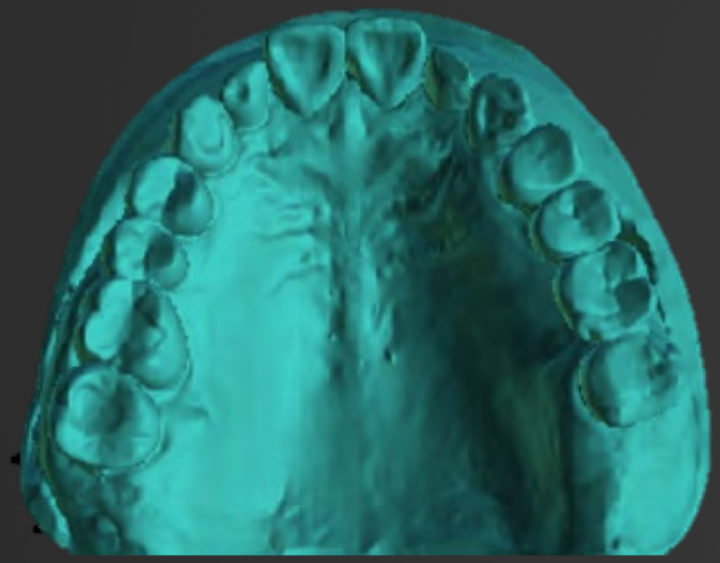


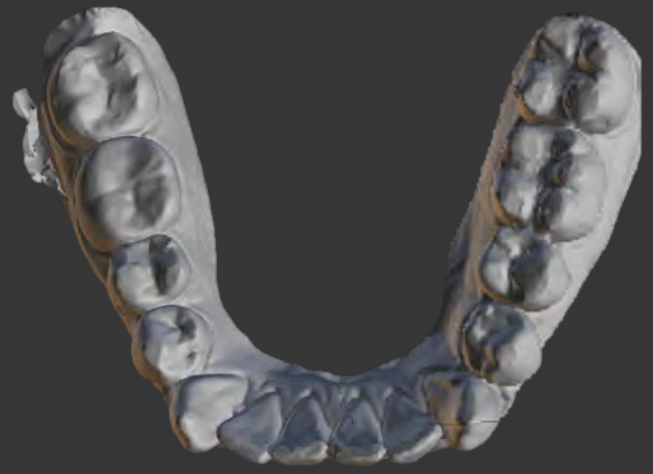


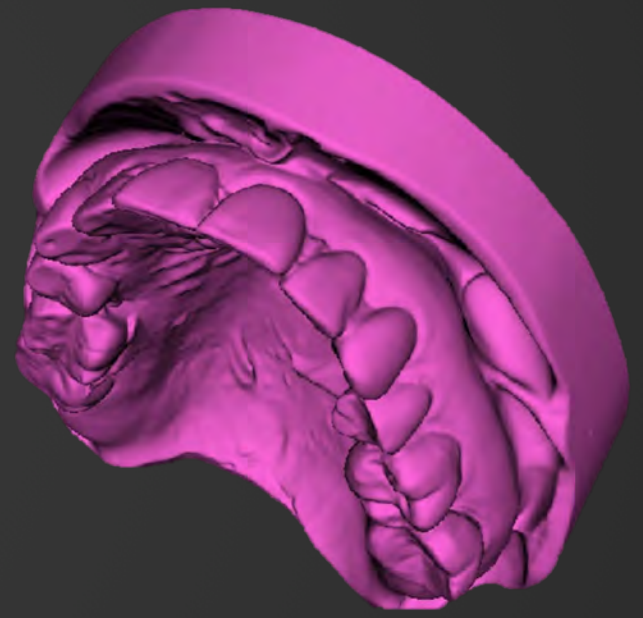




DIGITAL MODEL

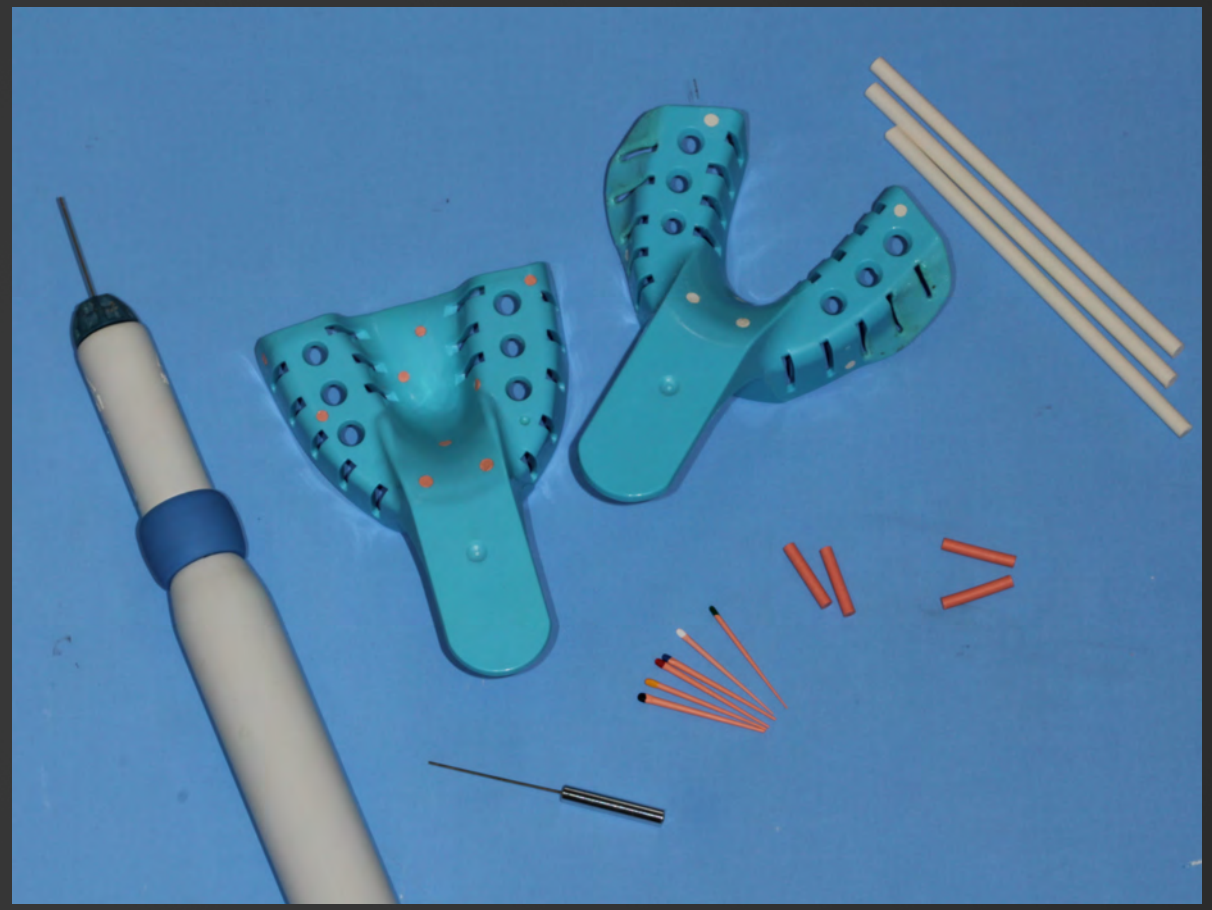






IMPRESSION

- Stock plastic tray
- Fiducial markers (4-6)
- PVS
- Capture Vestibule!



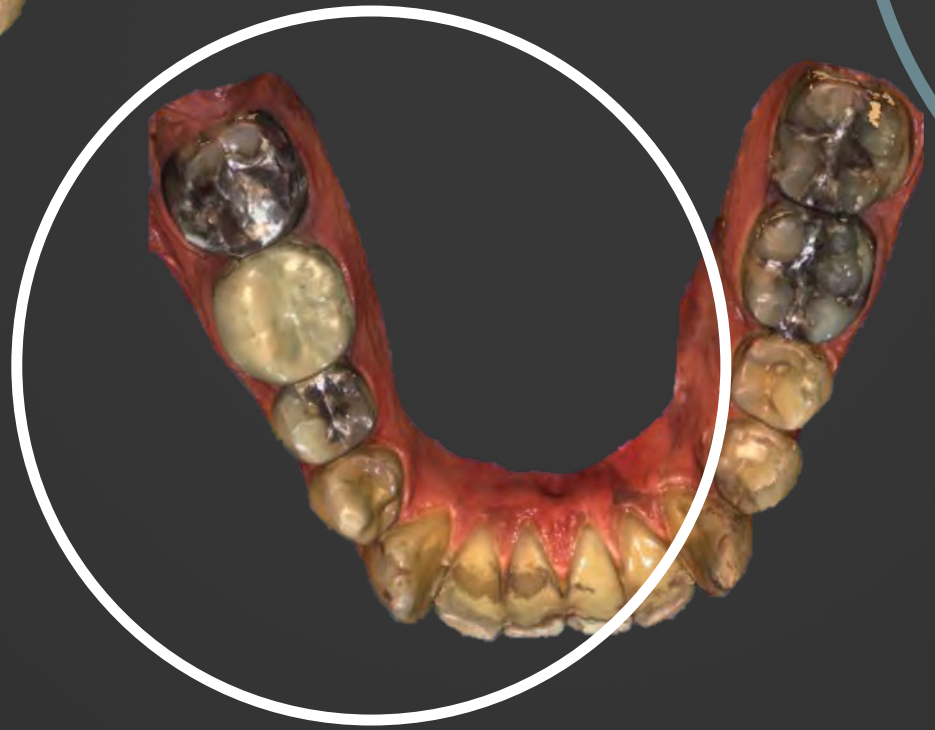
CBCT ACQUISITION

CBCT OF PATIENT

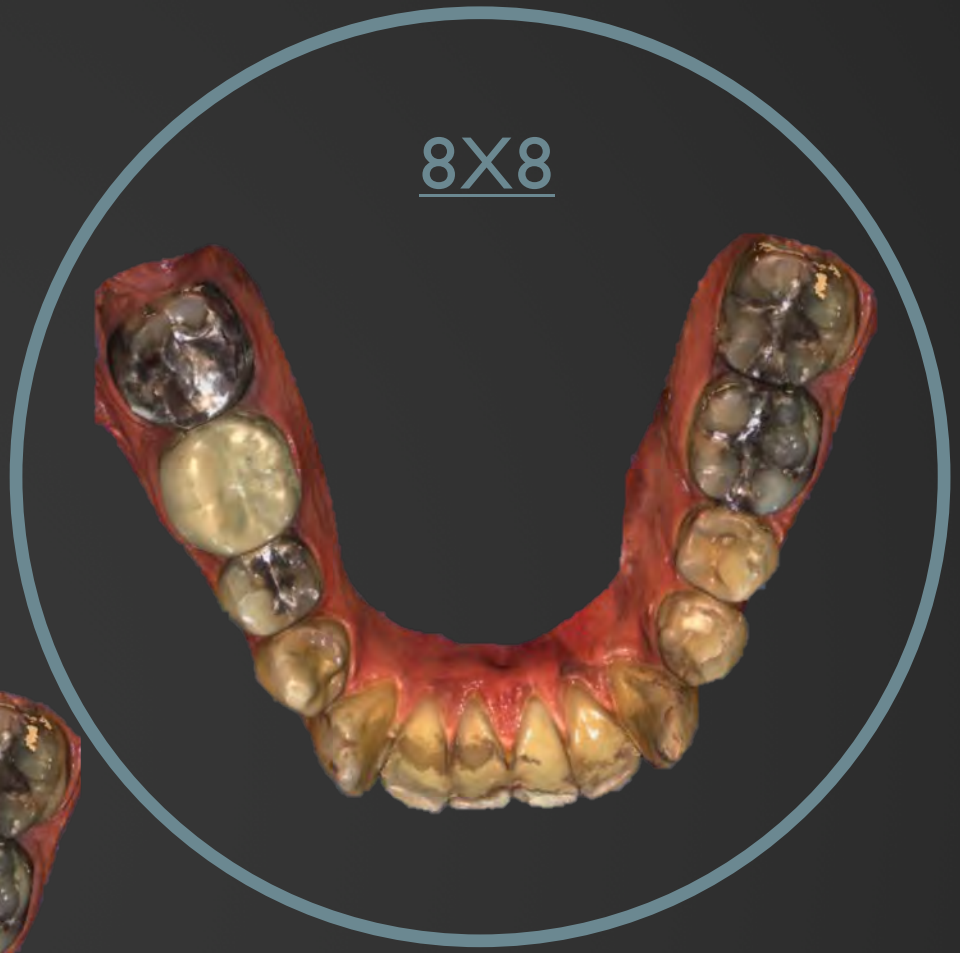
- Patient wears impression
- Place cotton rolls
- Size (8x8, 6x6, 4x4cm ?)

4X4

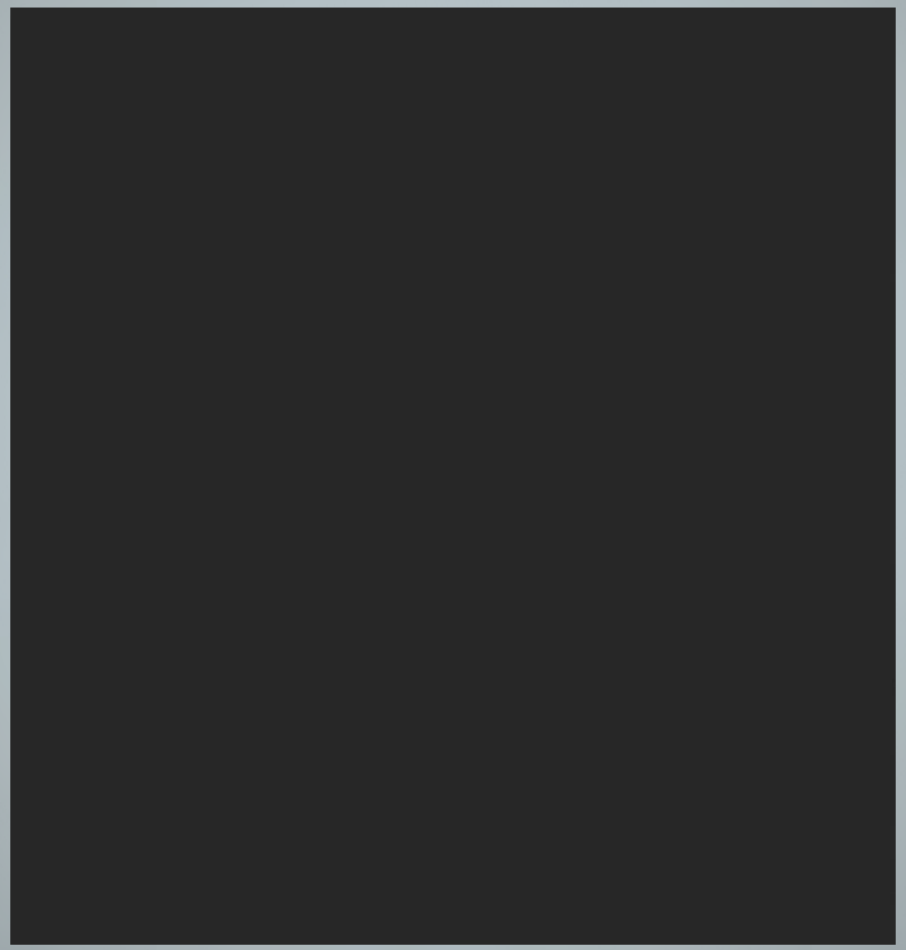
6X6



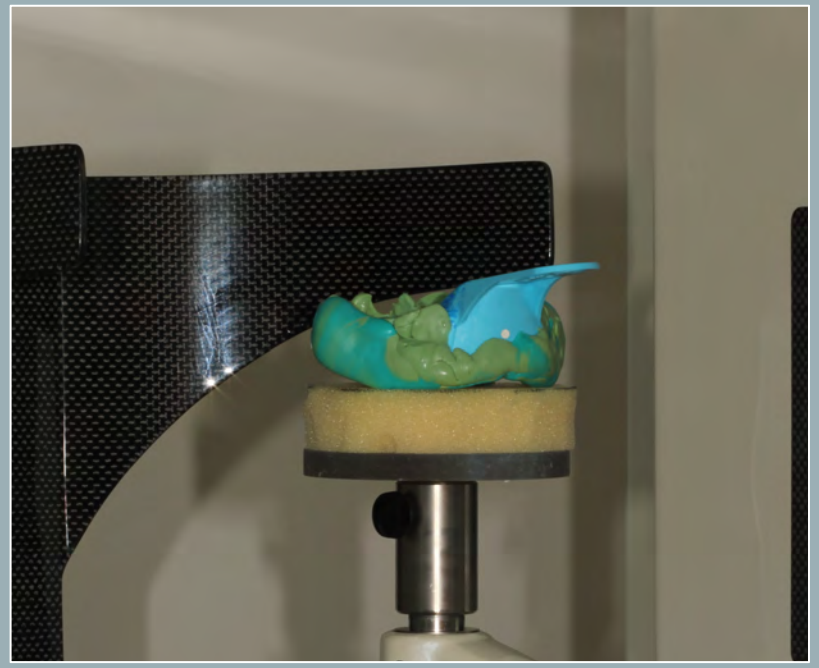
8X8



CBCT OF PATIENT



CBCT OF IMPRESSION

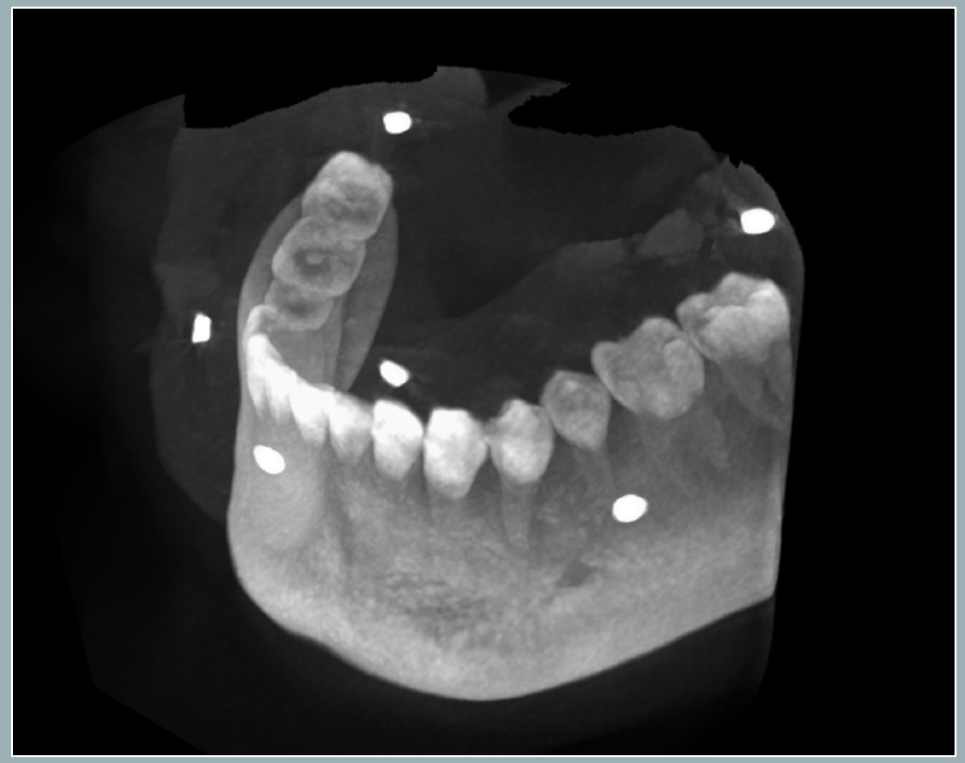


- Place in correct orientation
- Spacer/sponge
- Adjust CBCT settings (mA, kVp)

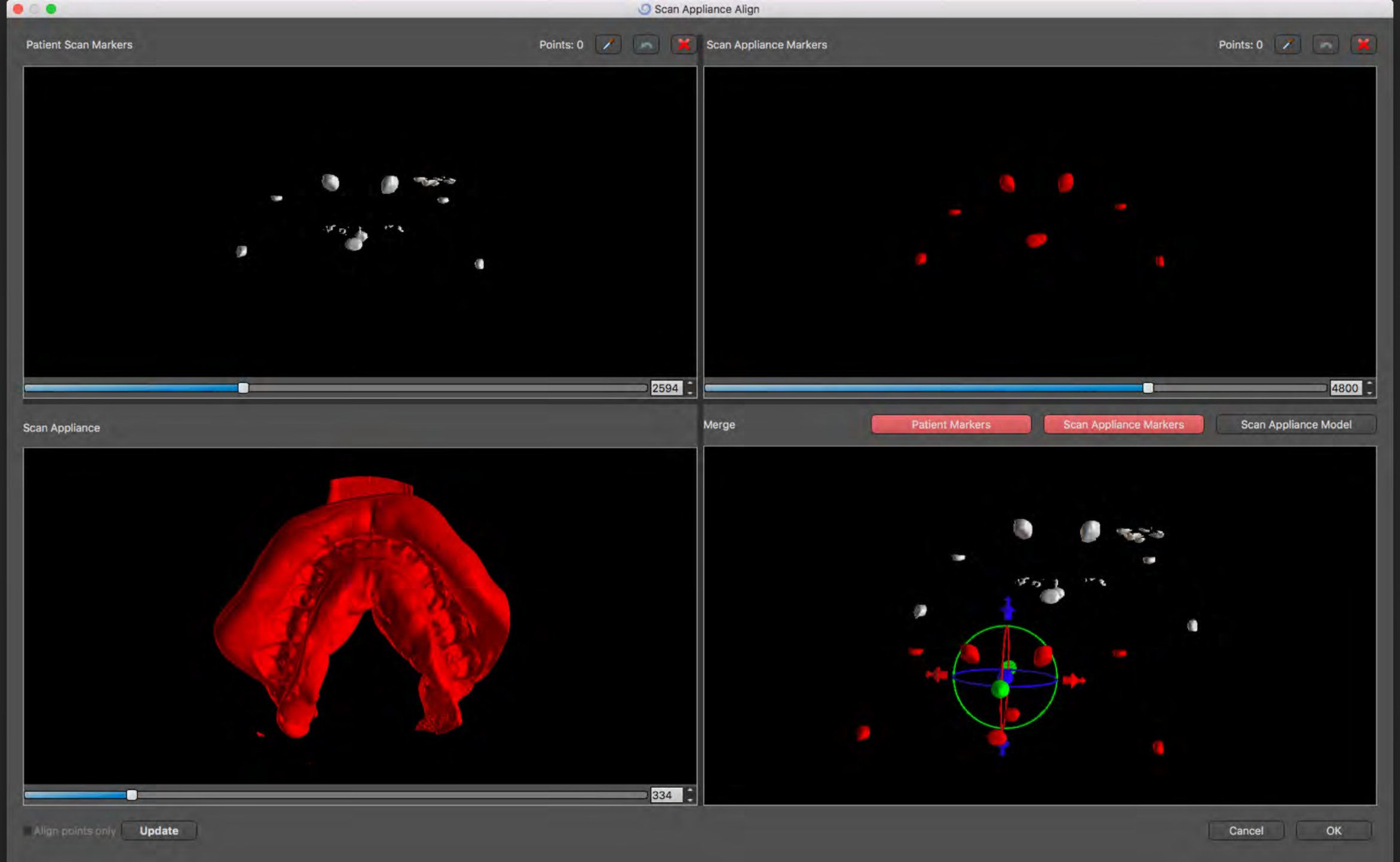
CBCT OF IMPRESSION

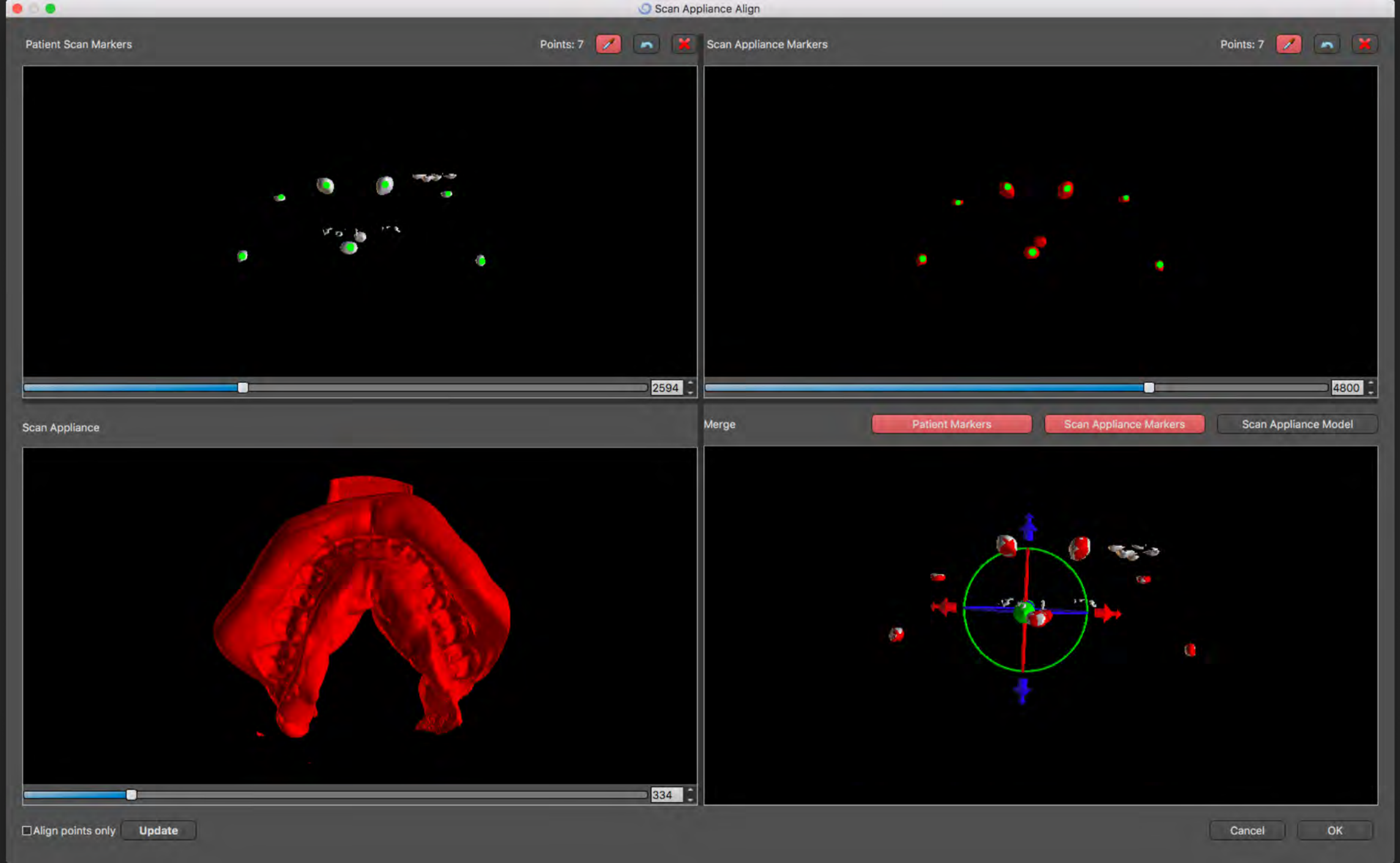
IMPORT

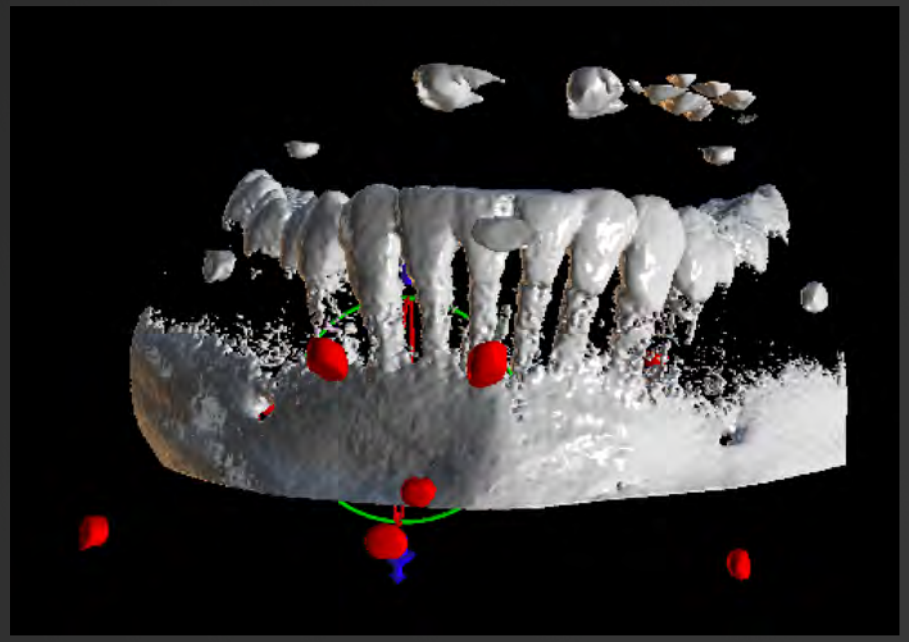
ALIGNMENT

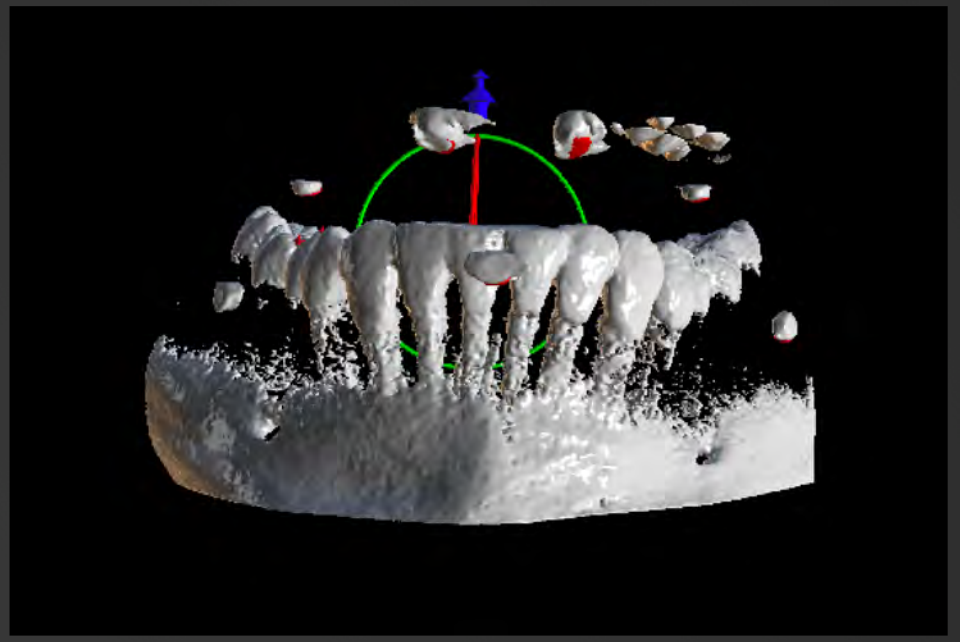


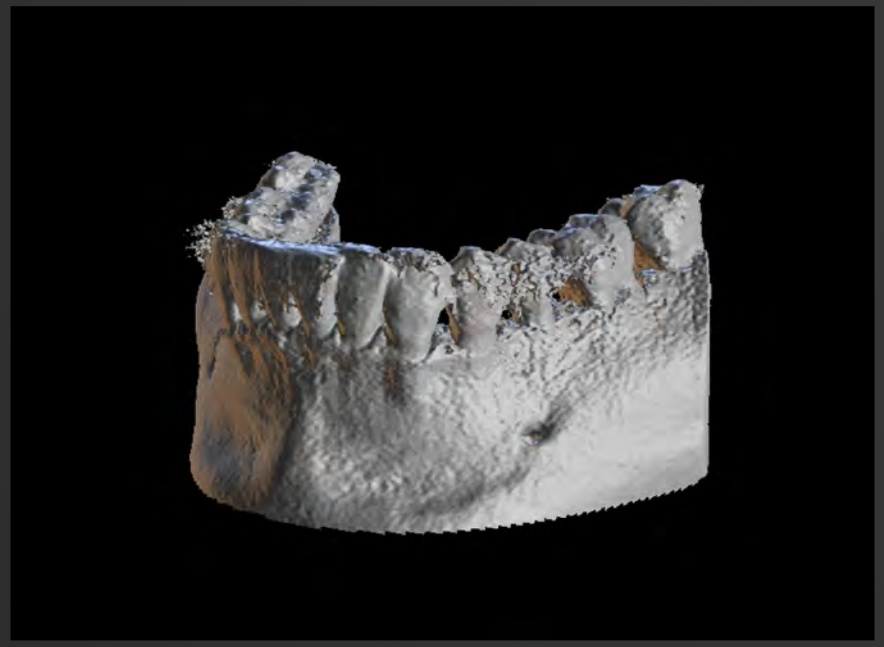
- Import patient CBCT DICOM
- Import impression DICOM
- Align via fiducial markers
- Adjust threshold (ISO value)

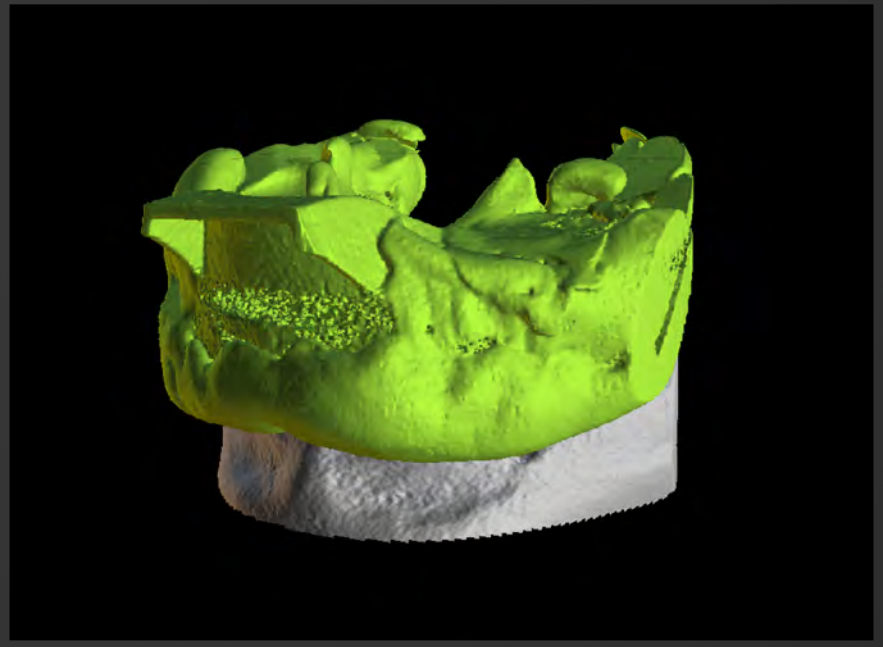

Scan Appliance Align
Patient Scan Markers
Points: 0
2594
Scan Appliance Markers
Points: 0
4800
Scan Appliance
334
Merge
Patient Markers
Scan Appliance Markers
Scan Appliance Model
Align points only
Update
Cancel
OK


Scan Appliance Align
Patient Scan Markers
Points: 7
2594
Scan Appliance Markers
Points: 7
4800
Scan Appliance
334
Merge
Patient Markers
Scan Appliance Markers
Scan Appliance Model
Align points only
Update
Cancel
OK

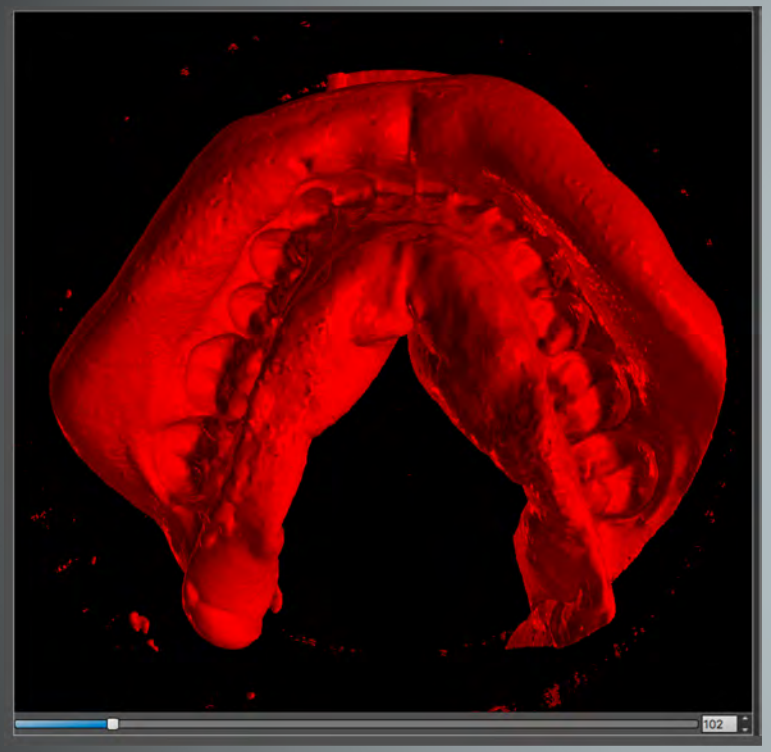


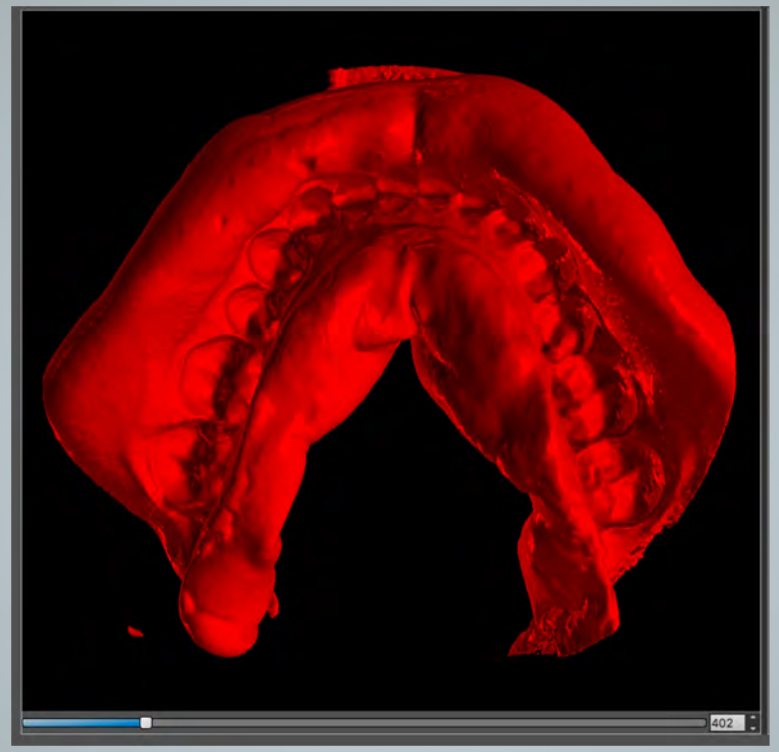


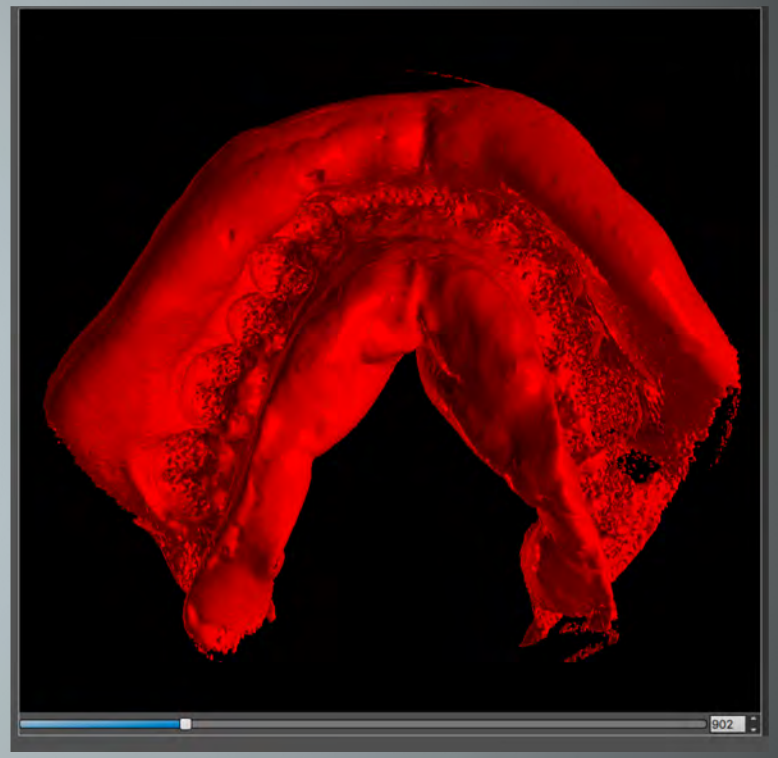




THRESHOLD VALUES MATTER!

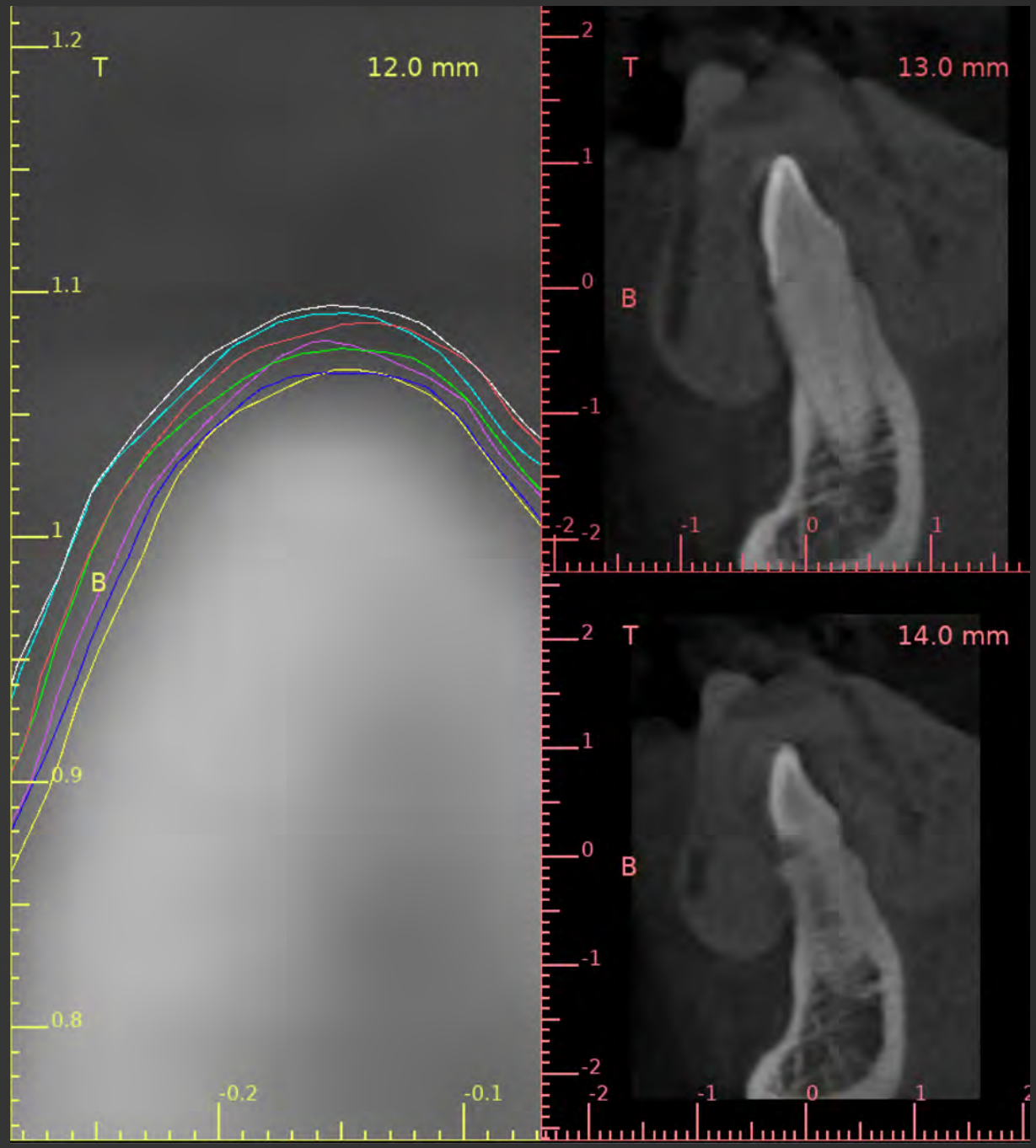


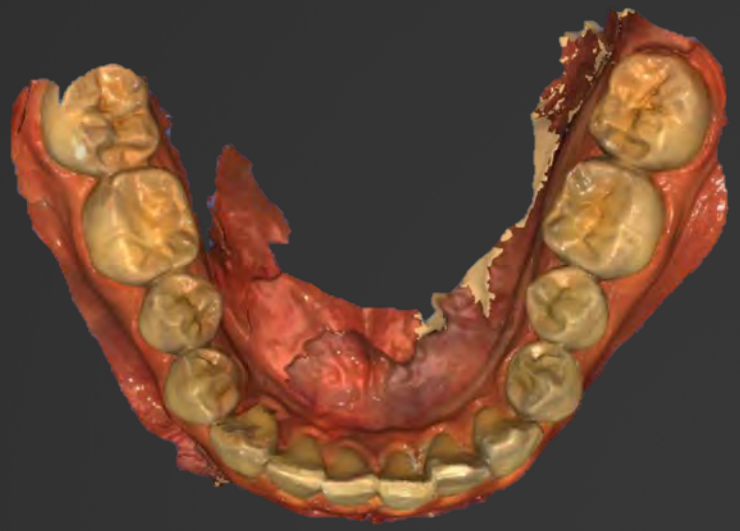


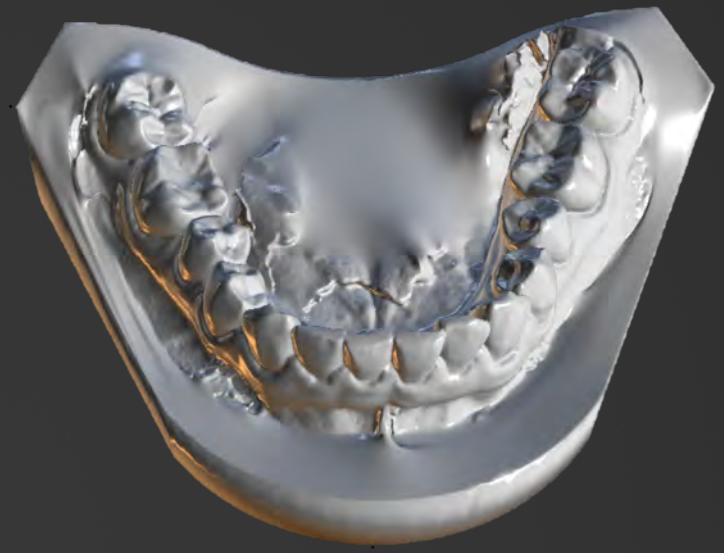


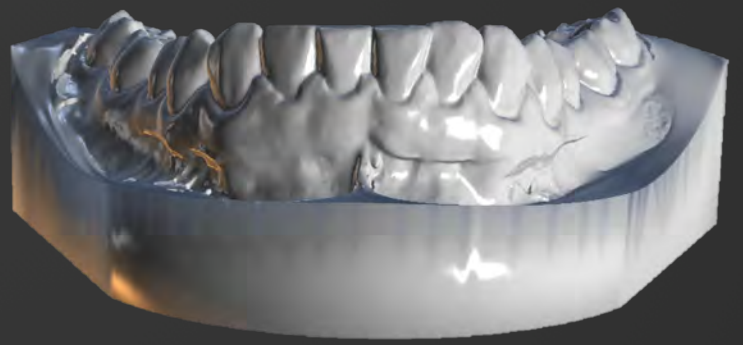
STL Surfaces

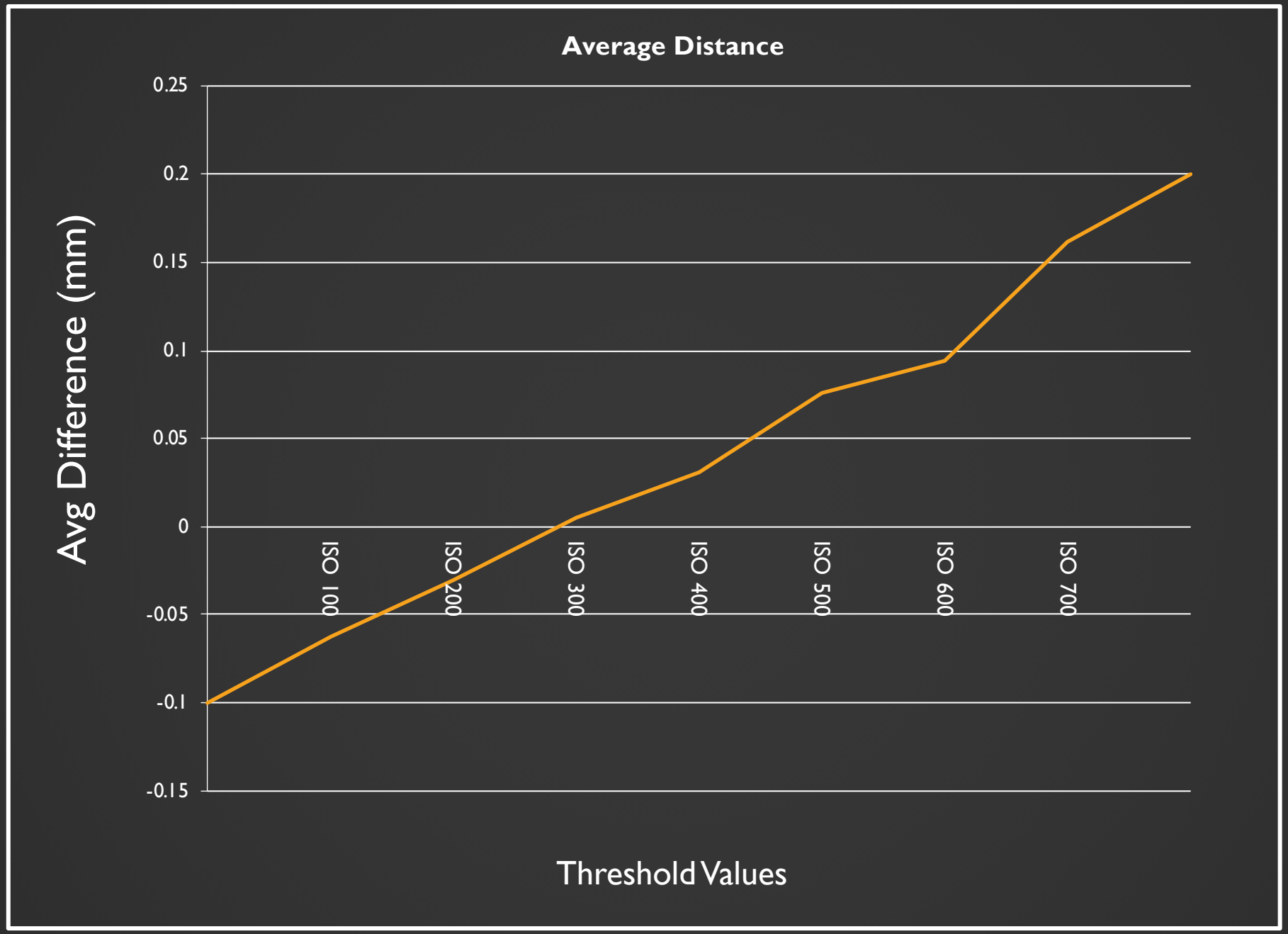
Name	Visible	Hint	Color	
Impression	☐	☐		✖
ISO 100	☐	☑		✖
ISO 200	☐	☑		✖
ISO 300	☐	☑		✖
ISO 400	☐	☑		✖
ISO 600	☐	☑		✖
ISO 500	☐	☑		✖
ISO 700	☐	☑		✖



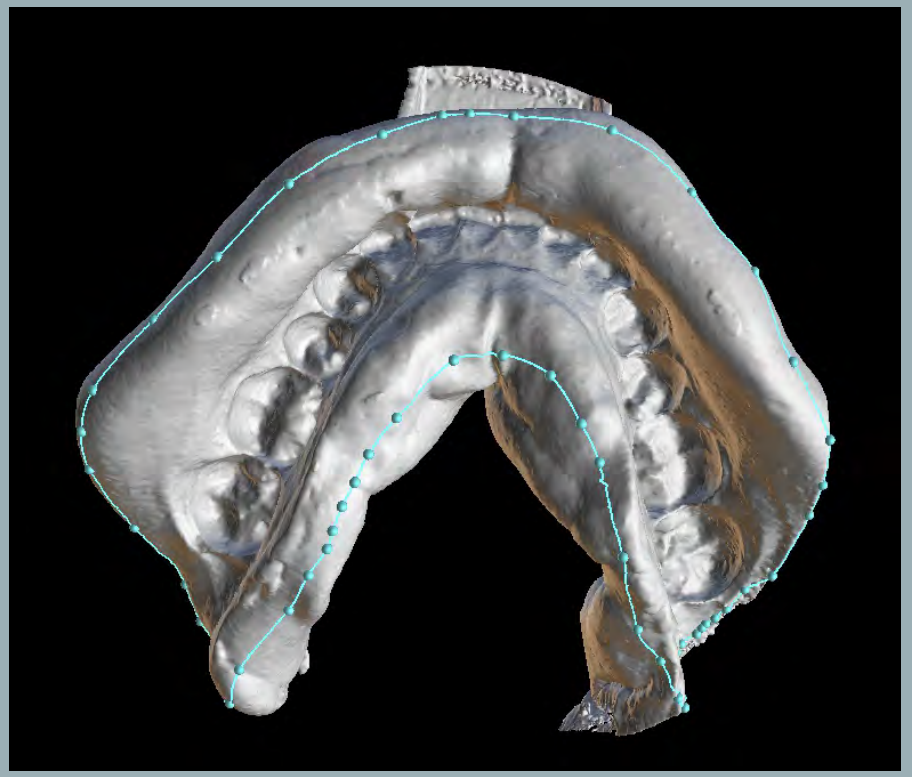






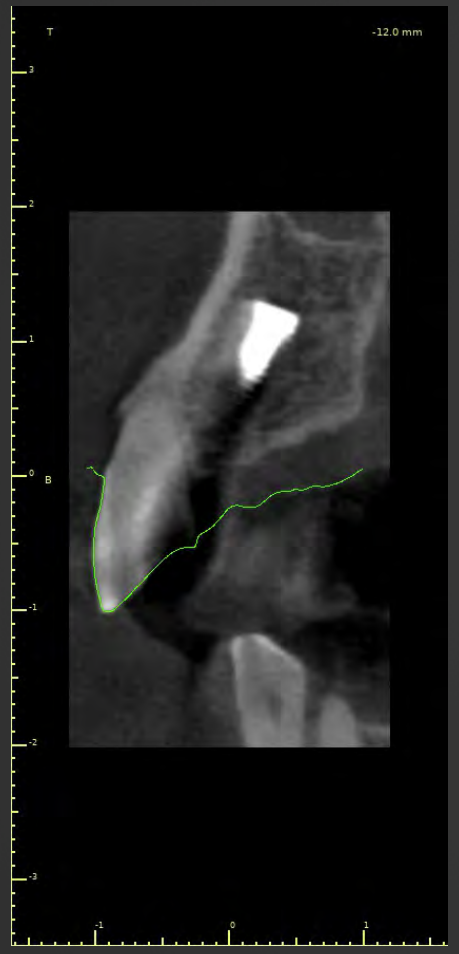

Average Distance
Avg Difference (mm)
0.25
0.2
0.15
0.1
0.05
0
-0.05
-0.1
-0.15
ISO 100
ISO 200
ISO 300
ISO 400
ISO 500
ISO 600
ISO 700
Threshold Values

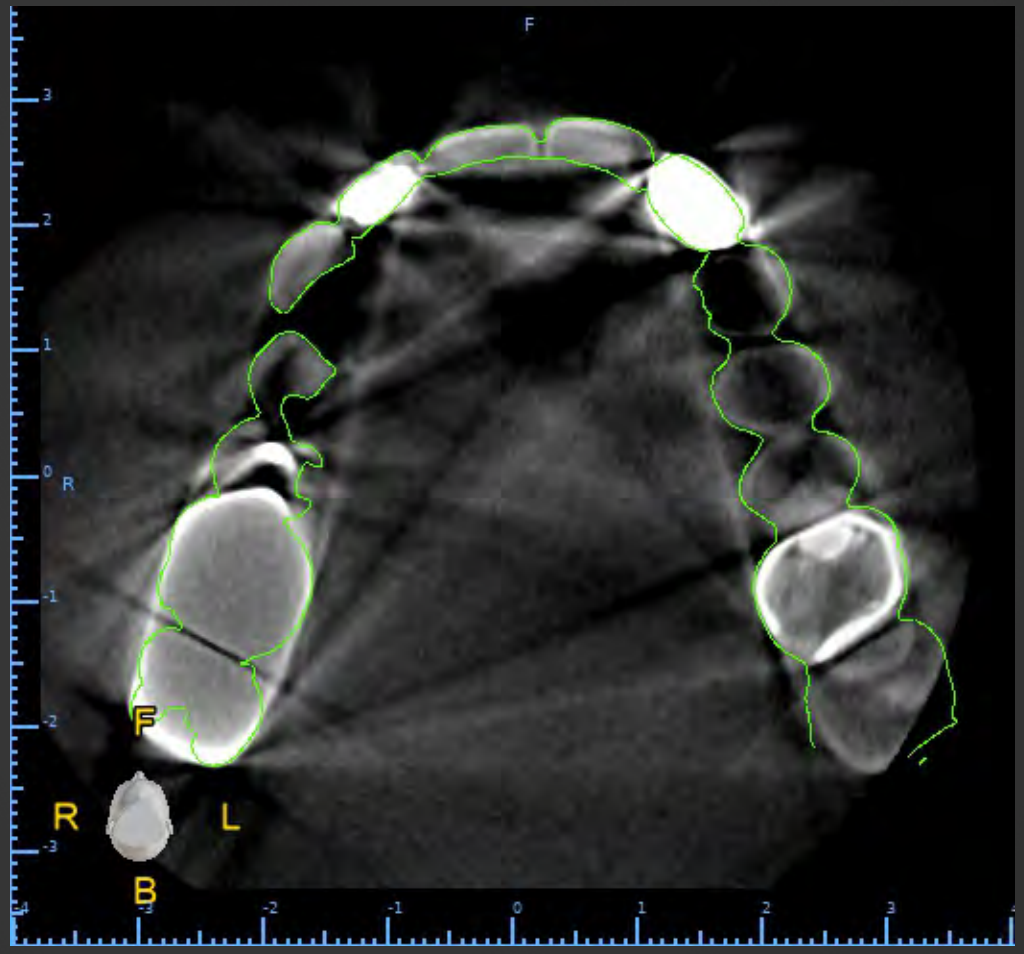
DIGITAL MODEL



- Draw borders
- Create digital model (inverted mesh)
- Verify Alignment**

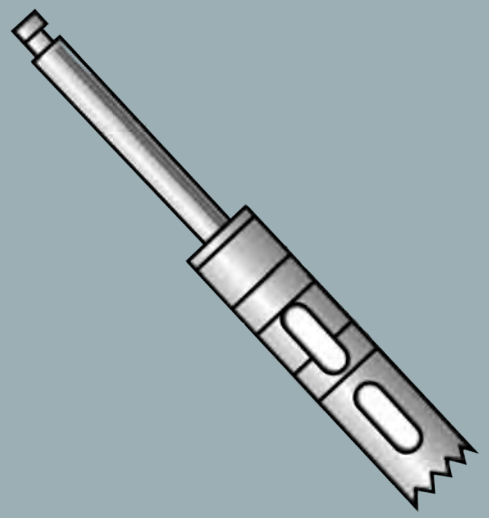
Verify Alignment





TREPHINE PLACEMENT

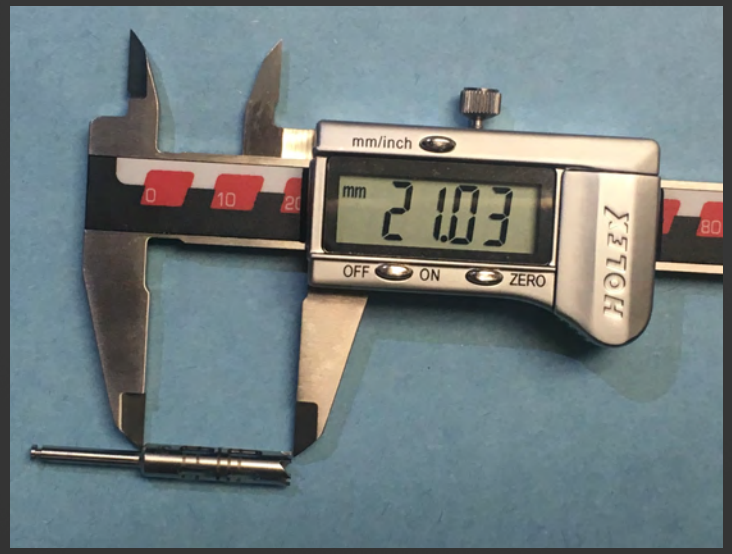
”CUSTOM IMPLANT”

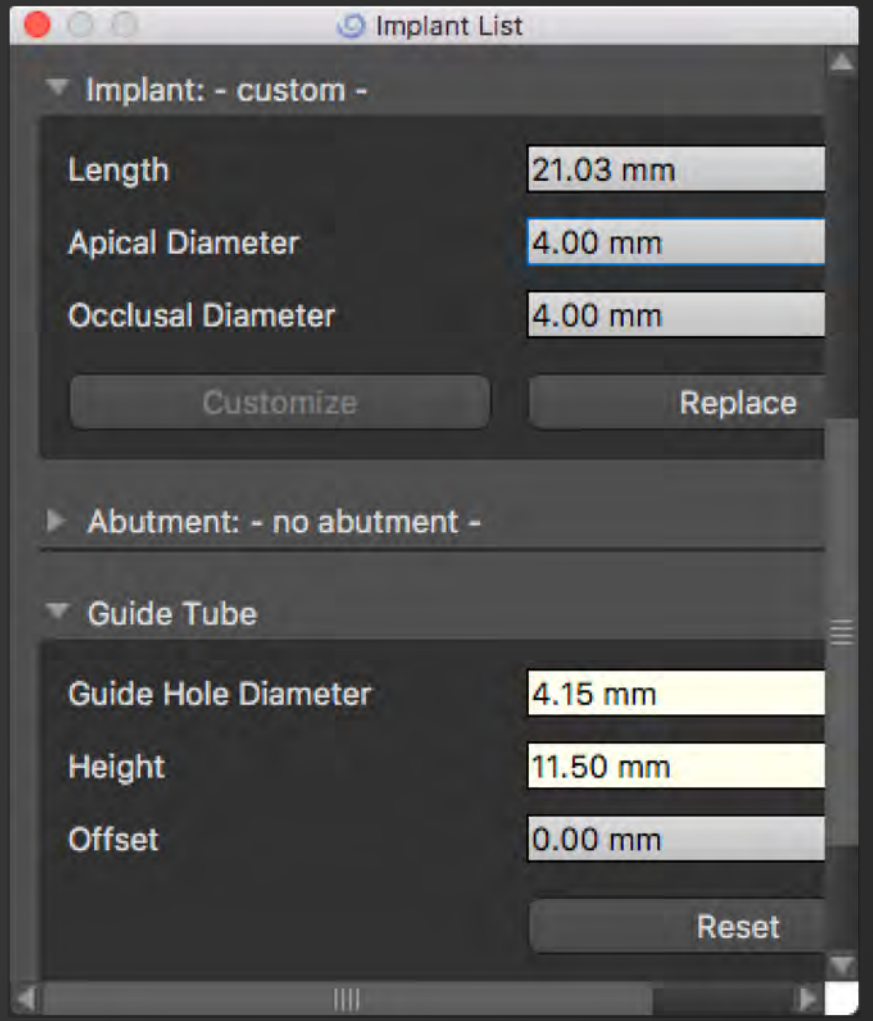


- Implant = Trephine
- Parallel instead of tapered
- Choose appropriate size
- Place for desired root resection
- Adjust implant size if needed

4.0mm
5.0mm

mm/inch
mm
4.00
OFF
ON
ZERO
HOLEX


mm/inch
mm
21.03
OFF
ON
ZERO
HOLEX


Implant List
Implant: - custom -
Length
21.03 mm
Apical Diameter
4.00 mm
Occlusal Diameter
4.00 mm
Customize
Replace
Abutment: - no abutment -
Guide Tube
Guide Hole Diameter
4.15 mm
Height
11.50 mm
Offset
0.00 mm
Reset

Implant List

Implant: - custom -

Length	21.03 mm
Apical Diameter	4.00 mm
Occlusal Diameter	4.00 mm

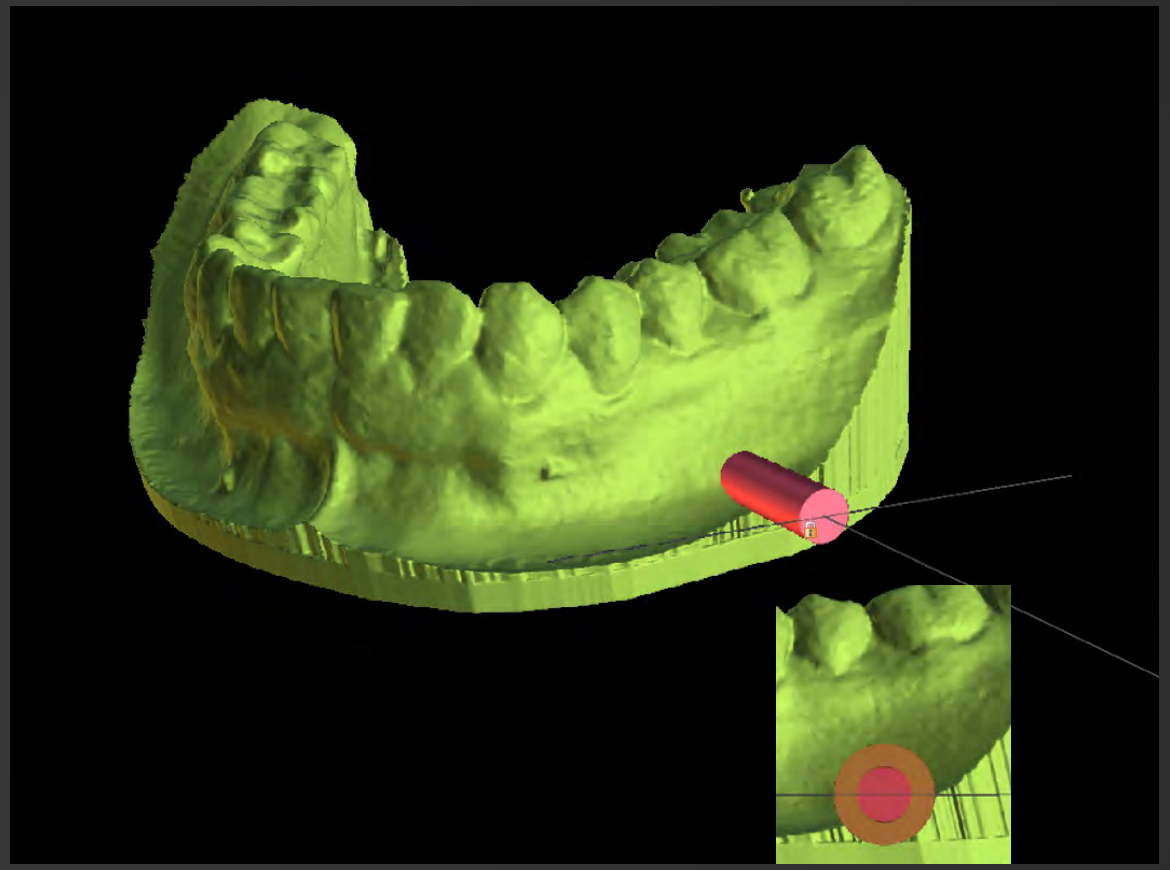
Customize | Replace

Abutment: - no abutment -

Guide Tube

Guide Hole Diameter	4.15 mm
Height	11.50 mm
Offset	0.00 mm

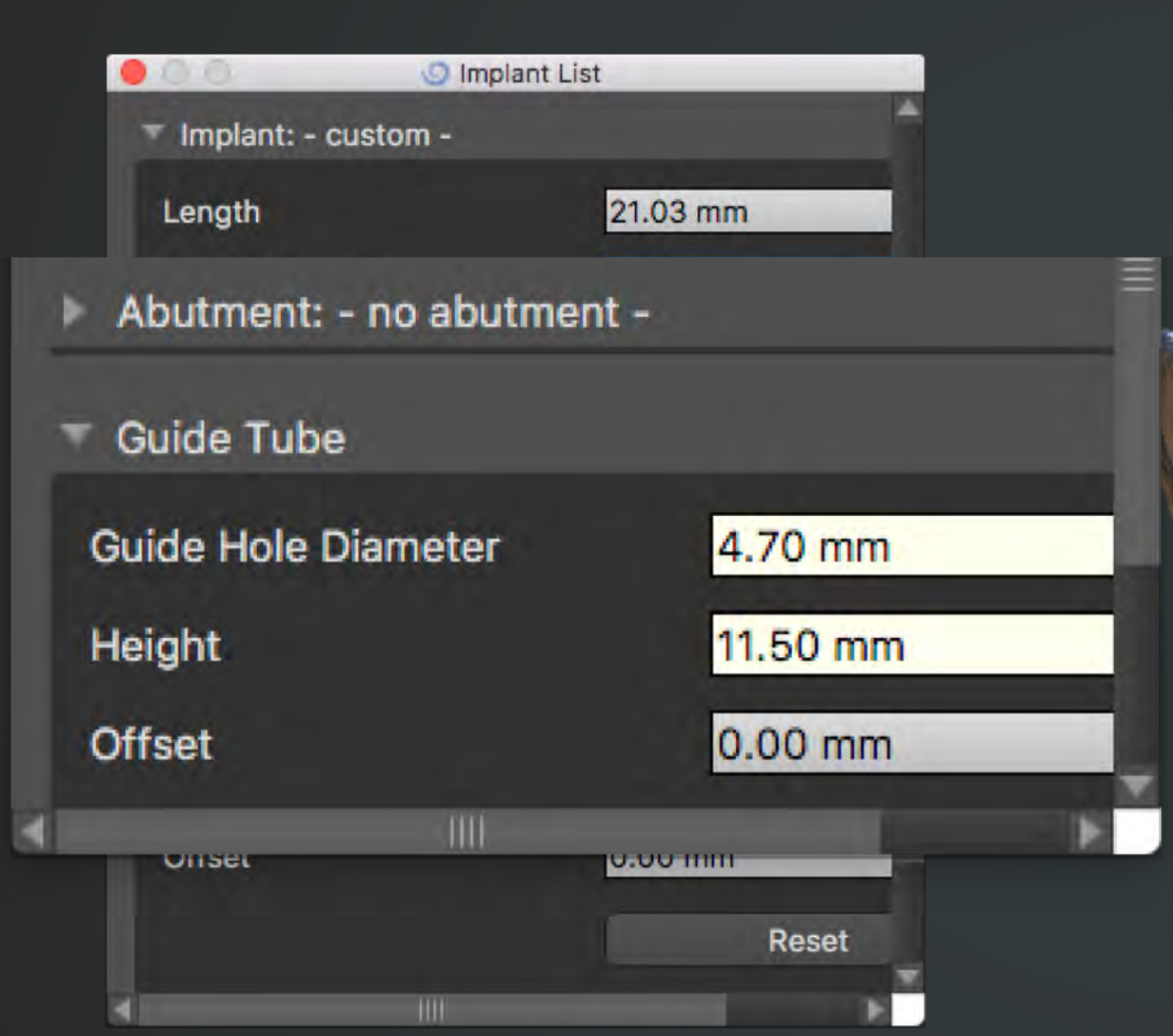
Reset

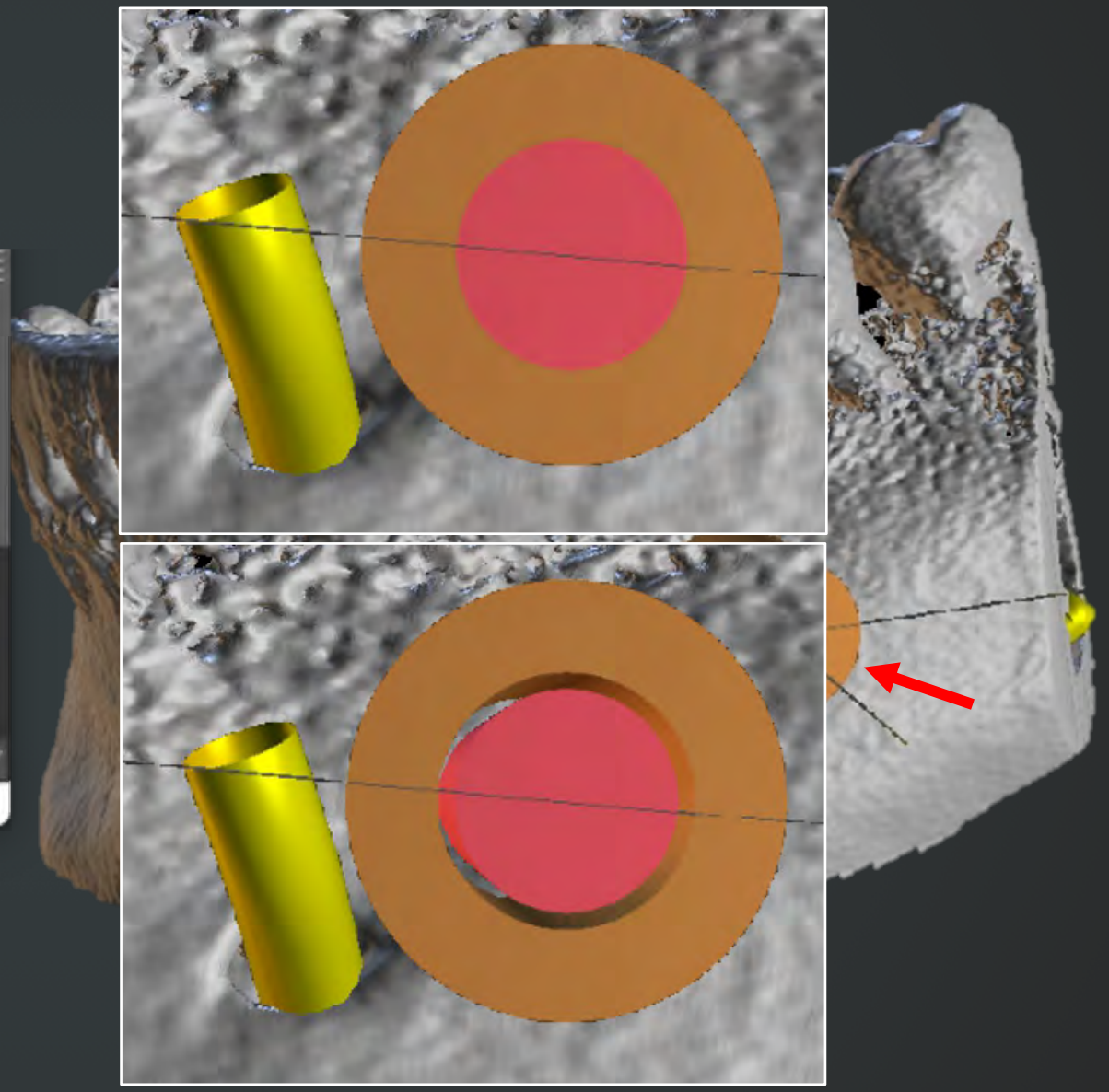


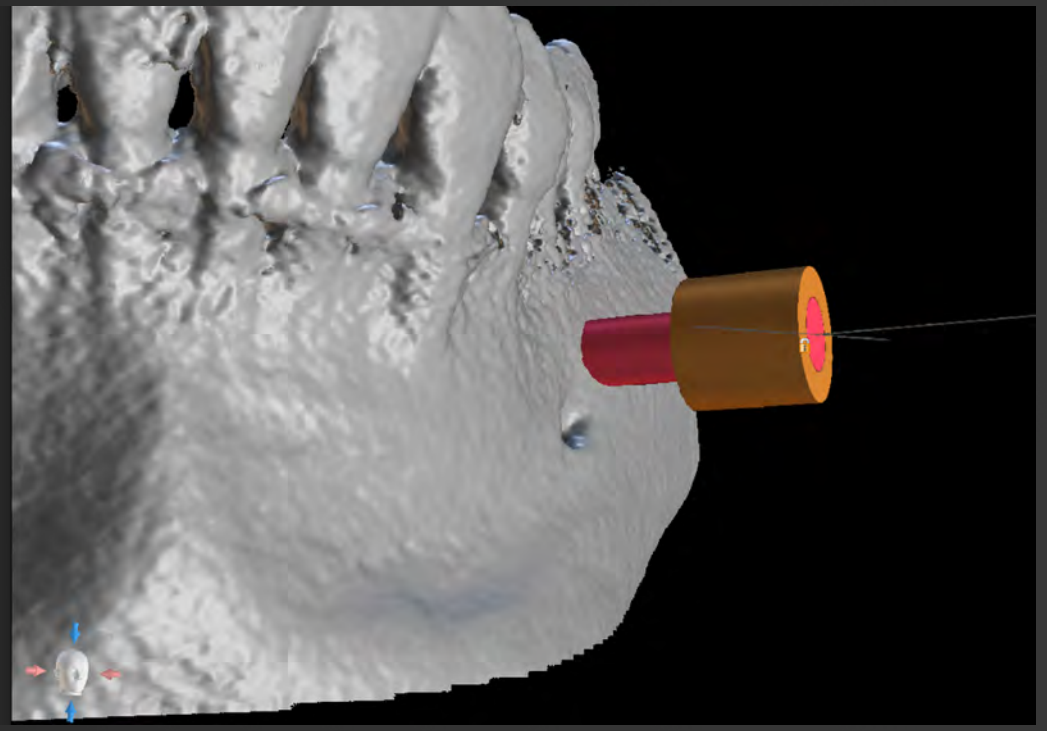
GUIDE CYLINDER

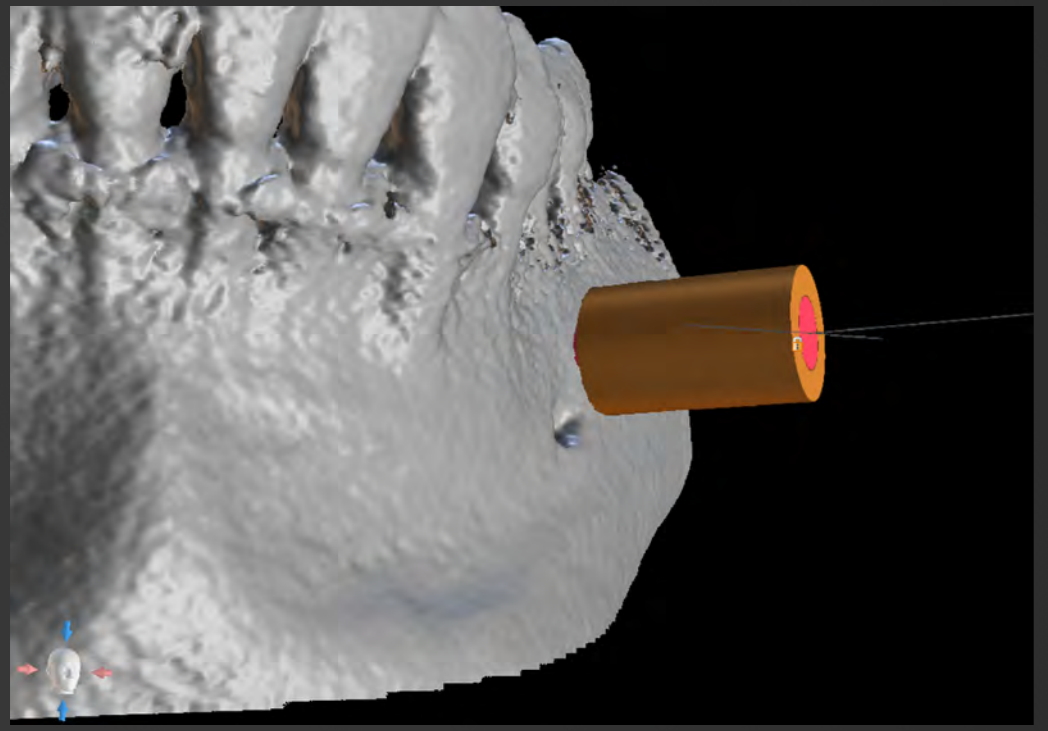
- Tolerance
- Offset
- Height (length)

GUIDE TUBE TOLERANCE







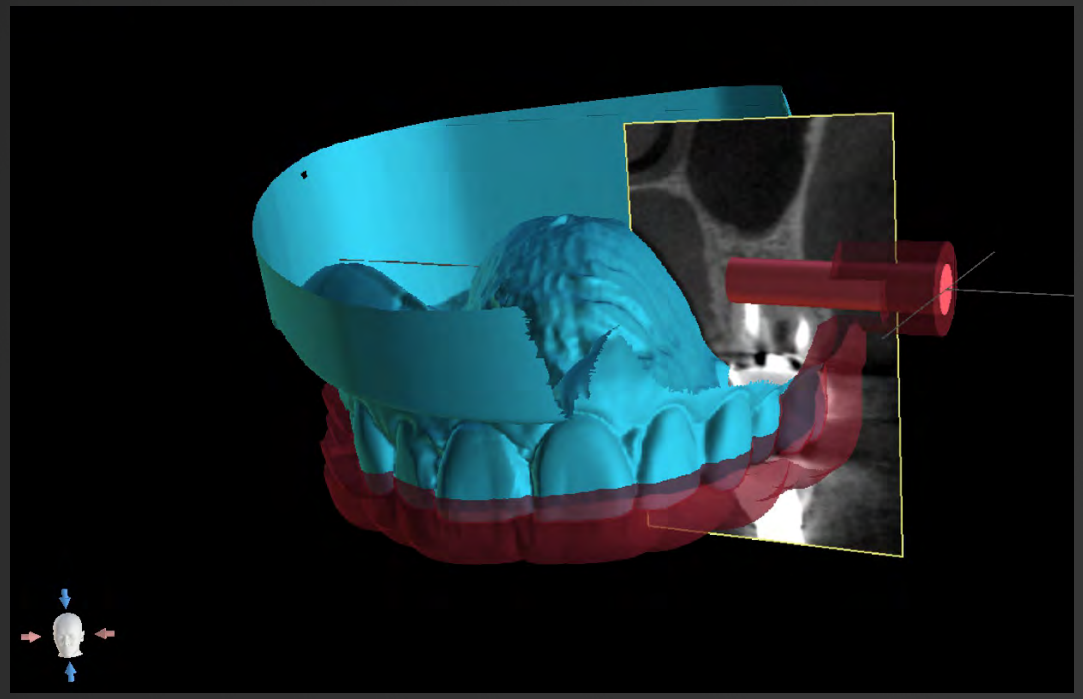


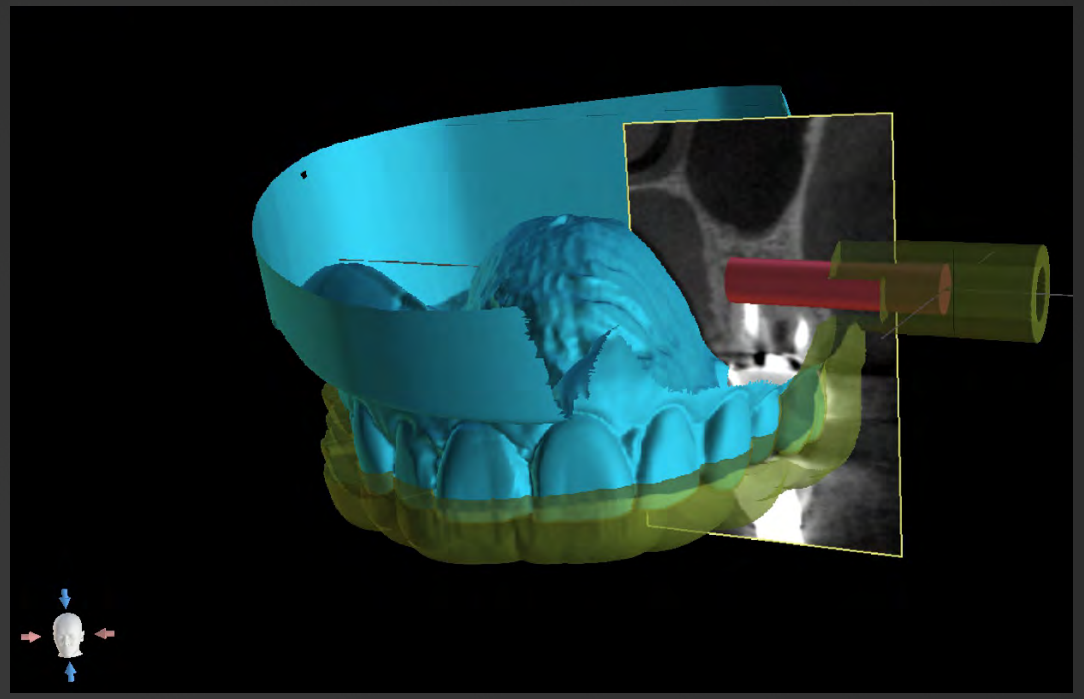
Guide Tube

Guide Hole Diameter	4.15 mm
Height	7.00 mm
Offset	0.00 mm

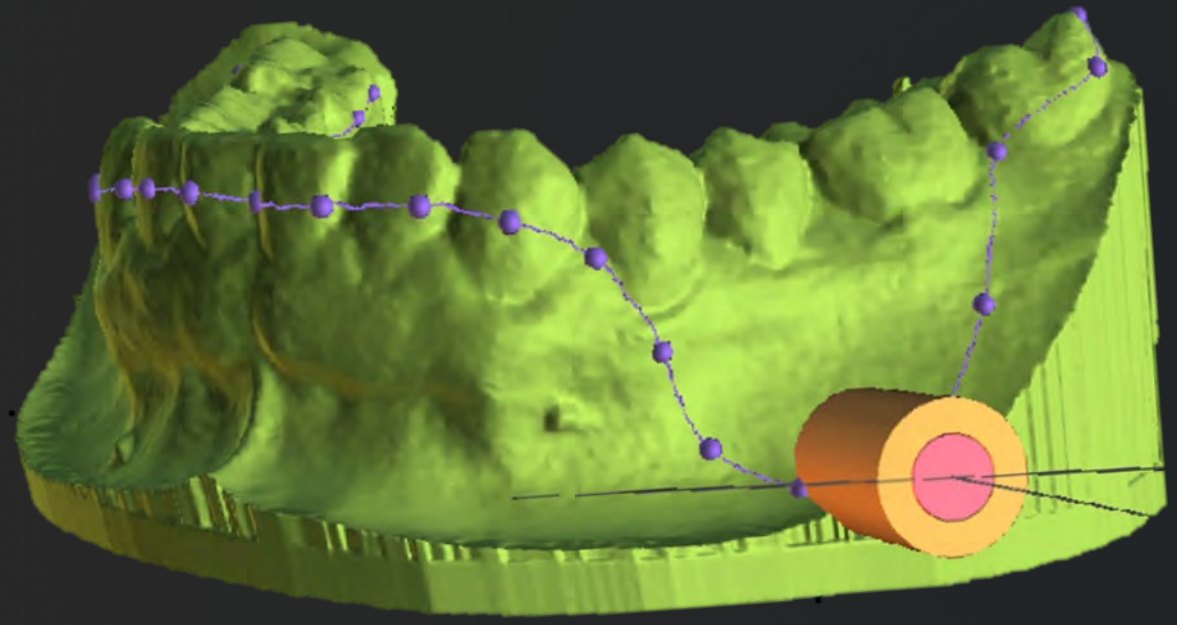
Guide Tube

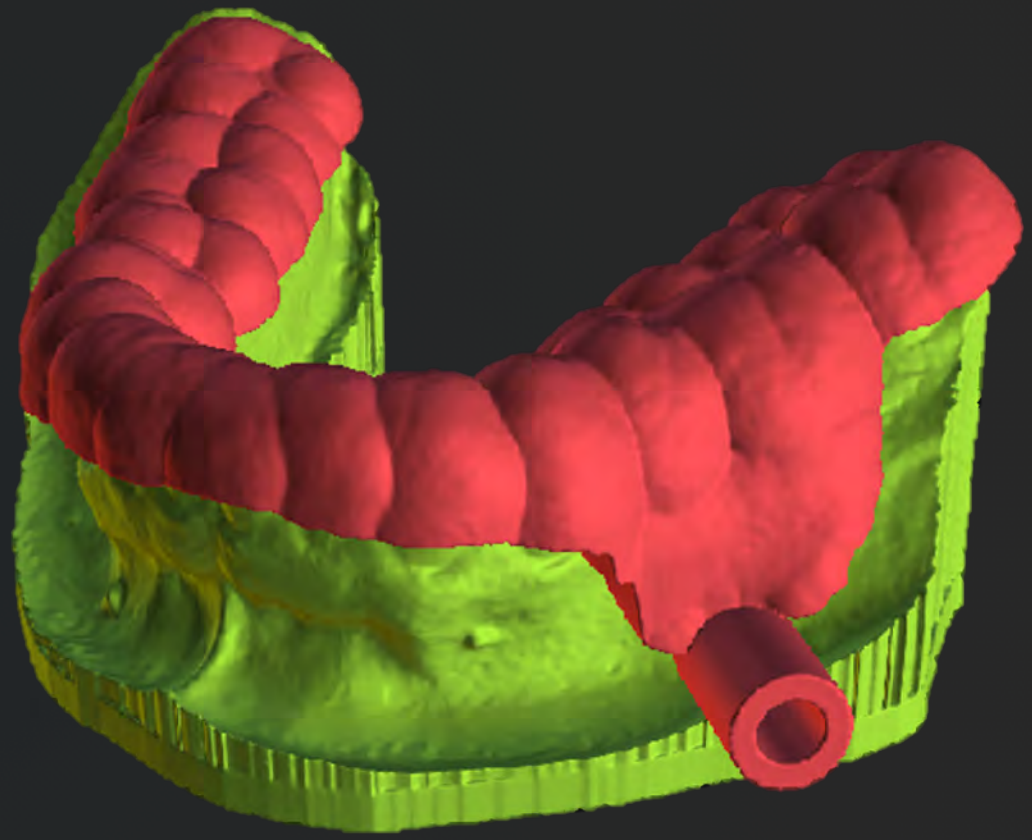
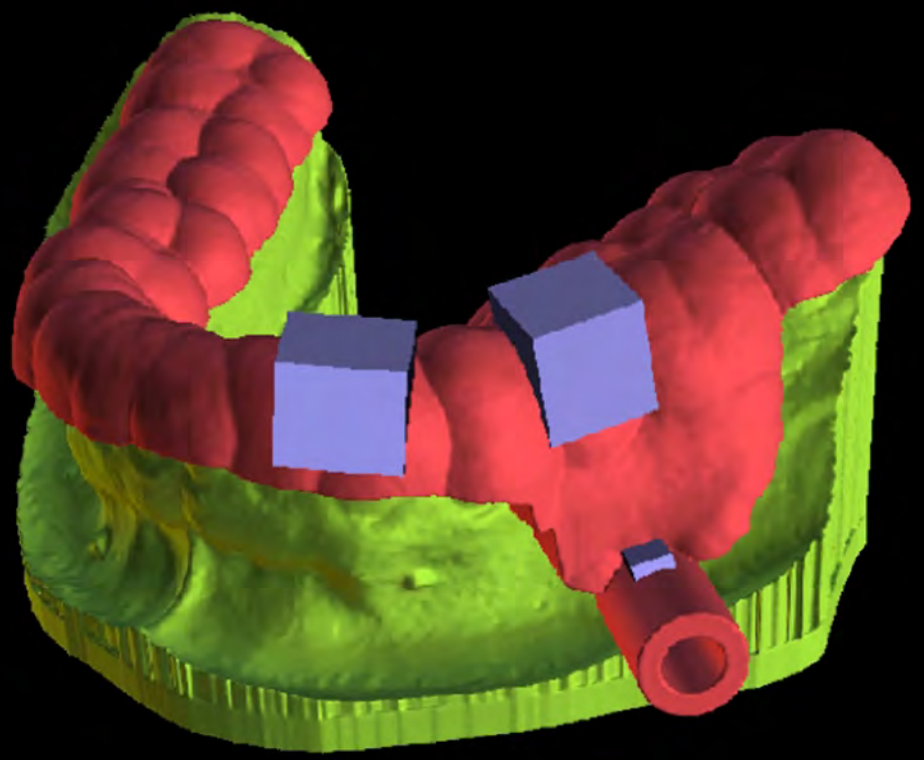
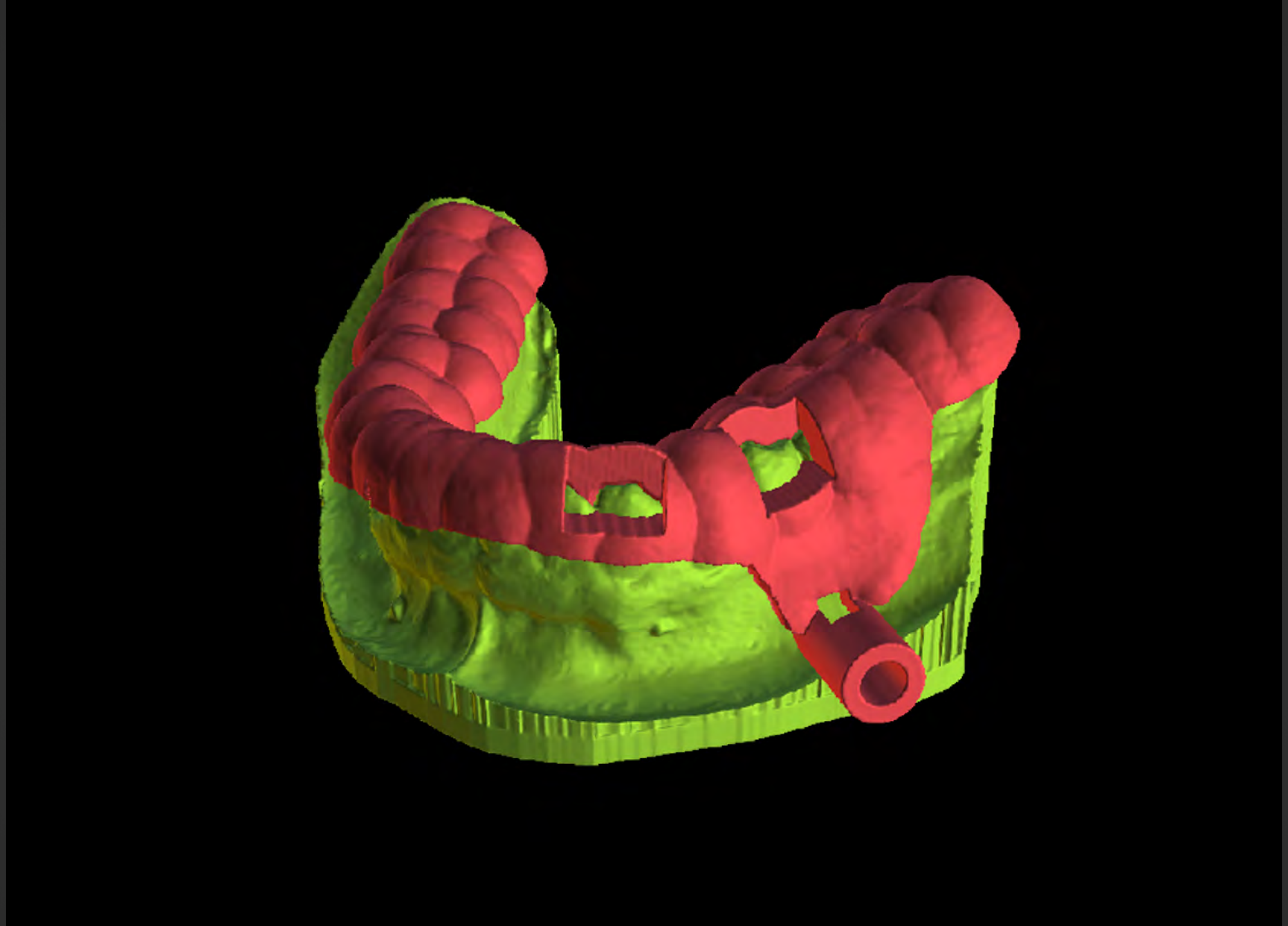
Guide Hole Diameter	4.15 mm
Height	12.00 mm
Offset	0.00 mm





GUIDE DESIGN





VERIFY WINDOWS/TRANSPARENCY