13rd A.I.O.T. National Congress

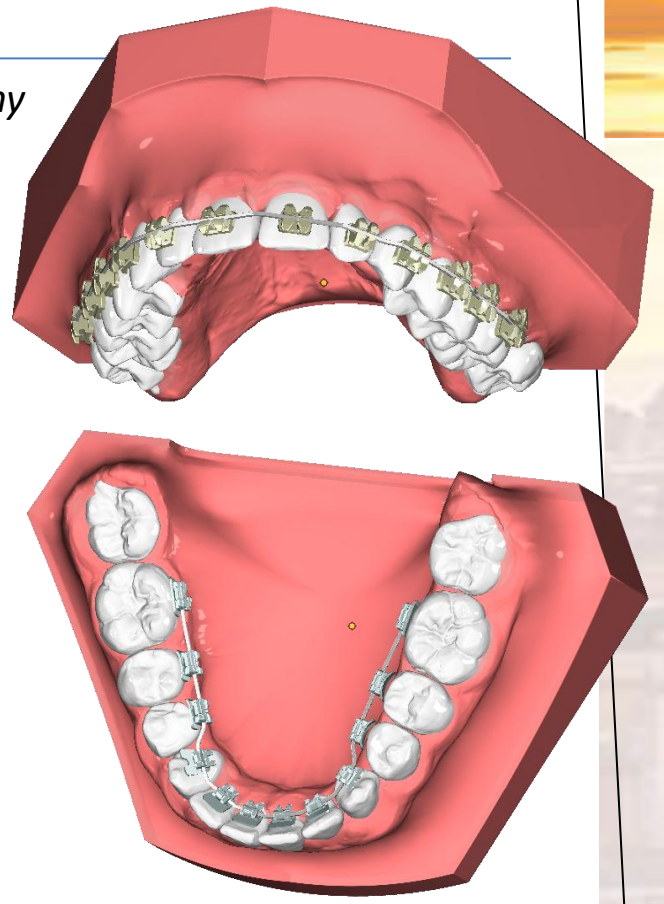
Digital i/d Bonding

In Orthodontics

June 3rd – June 4th 2016

Digital i/d Bonding

Rolf Kühnert, Chemnitz, Germany



Introduction
Overview OnyxCeph³™

Workflow
- Preparation

FA_Bonding
Wire_Bonding
- Virtual Setup
- Bracket-/Wire-Placement

Bracket Position Transfer
- Indirect Methods
- Direct/Mixed Methods

Other Planning Options (Examples)
Summary

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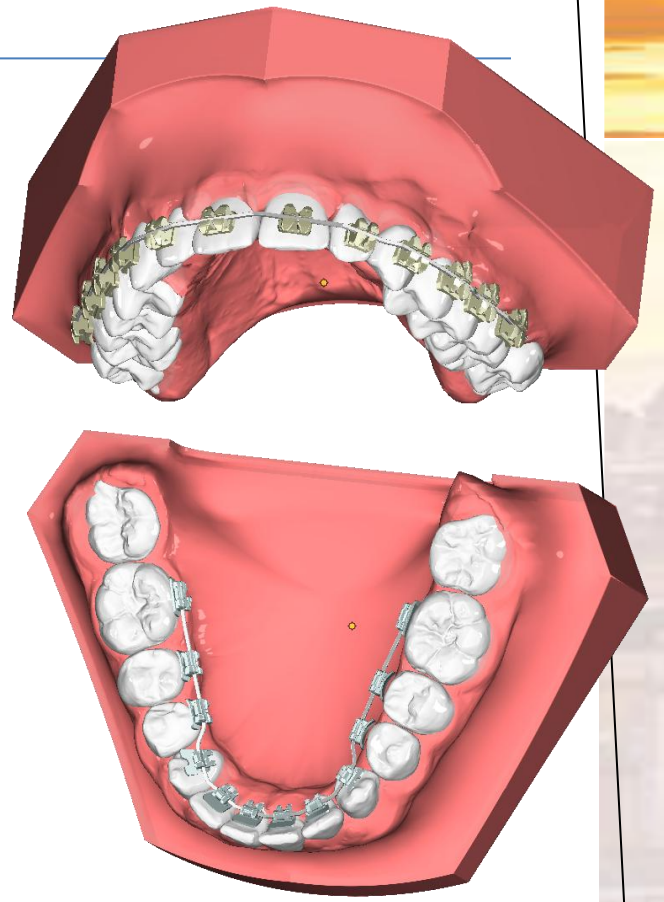


Introduction

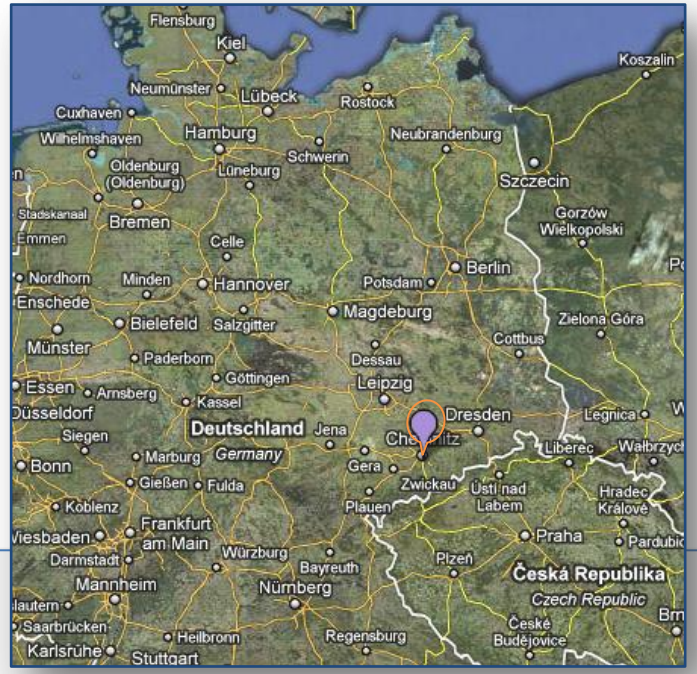
Rolf Kühnert *1956

1977–1982	Study of Physics Technical University Chemnitz, Germany
1982–1990	Academy of Sciences, Institute of Mechanics, Electron Microscopy Dptmt.
1986	DSc degree (Physics)
1990–1996	Coordinator Research Project German Research Foundation & EU-CRAFT Project
since 1995	Managing Director Image Instruments GmbH

Introduction

image *instruments*
GmbH
Olbernhauer Str. 5
D 09125 Chemnitz
Germany

+49 371 9093140
info@image-instruments.de



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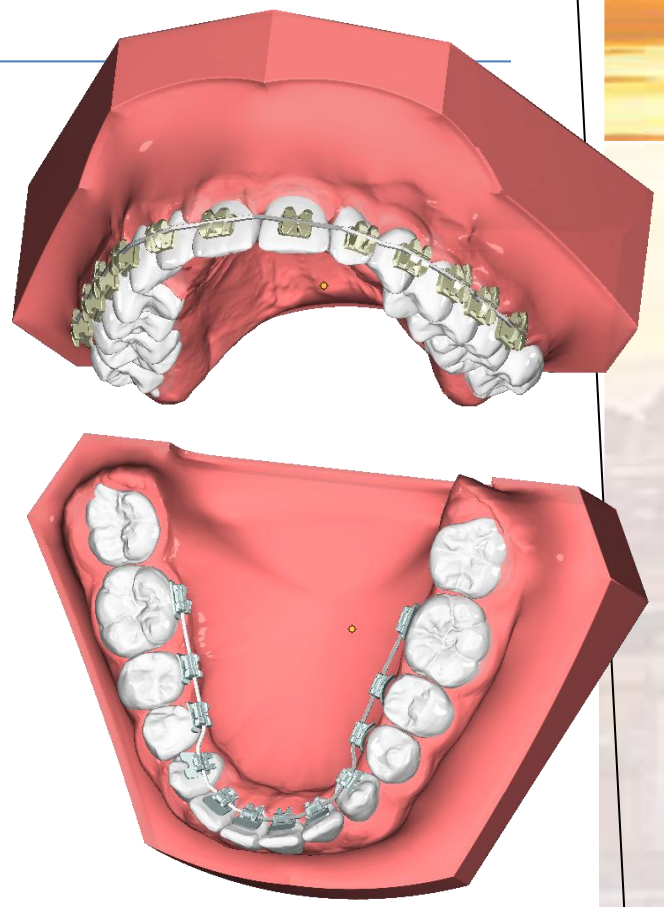

Overview OnyxCeph³™

- ✓ **MDD Medical Product**
- ✓ 2.400+ Registered Users
- ✓ 50+ Countries
- ✓ 8 Languages
- ✓ 5+ Program Versions
- ✓ 2 License Types

Intended Purpose

EN 62304

Software OnyxCeph™ is intended for the purpose of managing and diagnosticaly evaluate two-dimensional and tree-dimensionall image data by qualified personal in the framework of dental medicine applications.
Diagnostic and therapeutic evidence basing hereon may not primarily or exclusively be derived from measurement results provided by the software.
The intended medical purpose presupposes the regular registration and activation of the software by the user.
Non-registered trial versions of the software are only intended to become familiar with the application but not to be used according to above mentioned medical purpose.

CE 0494

OnyxCeph³™

Overview OnyxCeph³™

Open Subscription License OSL

Purchase License RL+

- Deutsch - German
- English
- Русский - Russian
- Español - Spanish
- Italiano - Italian
- Français - French
- Čech - Czech
- Magyar - Hungarian
- 한국 - Korean
- Slovenčina - Slovak

PRICES

Program Version	OSL	RL+	Support
2D Basic	100 p.a.	900	99 p.a.
3D Basic	200 p.a.	1.800	99 p.a.
2D Pro	300 p.a.	2.700	99 p.a.
3D Pro	400 p.a.	3.600	99 p.a.
3D Lab	n/a	4.800	99 p.a.

Prices in EUR plus VAT, if applicable

OnyxCeph³™

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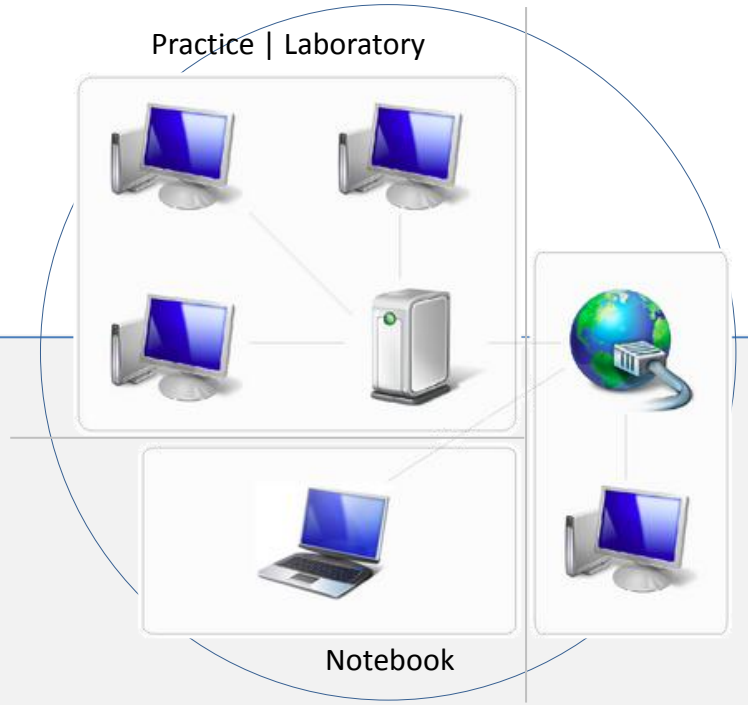
Client-/Server Windows ™ Application
incl. NexusDB-SQL Data Base for

- Image Archiving
- Image Diagnostics
- Image-Based Treatment Planning
- Patient Education

for 2D|3D Image Data in

- Orthodontics
- General Dentistry
- OMS

► *All-In-One Ortho Imaging Software* ◄



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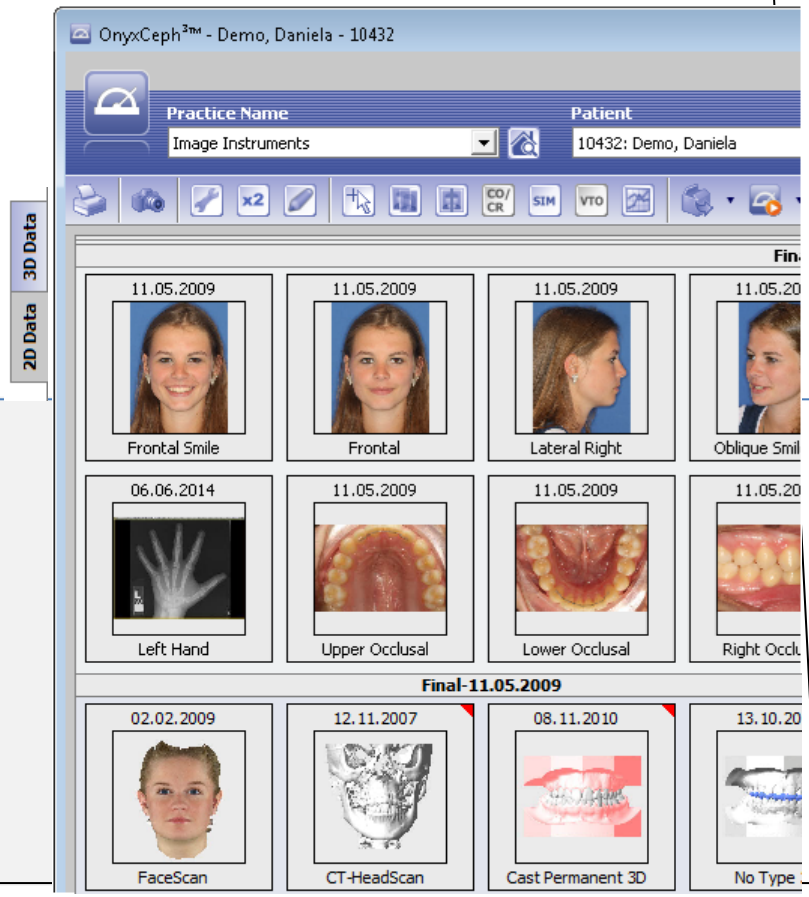

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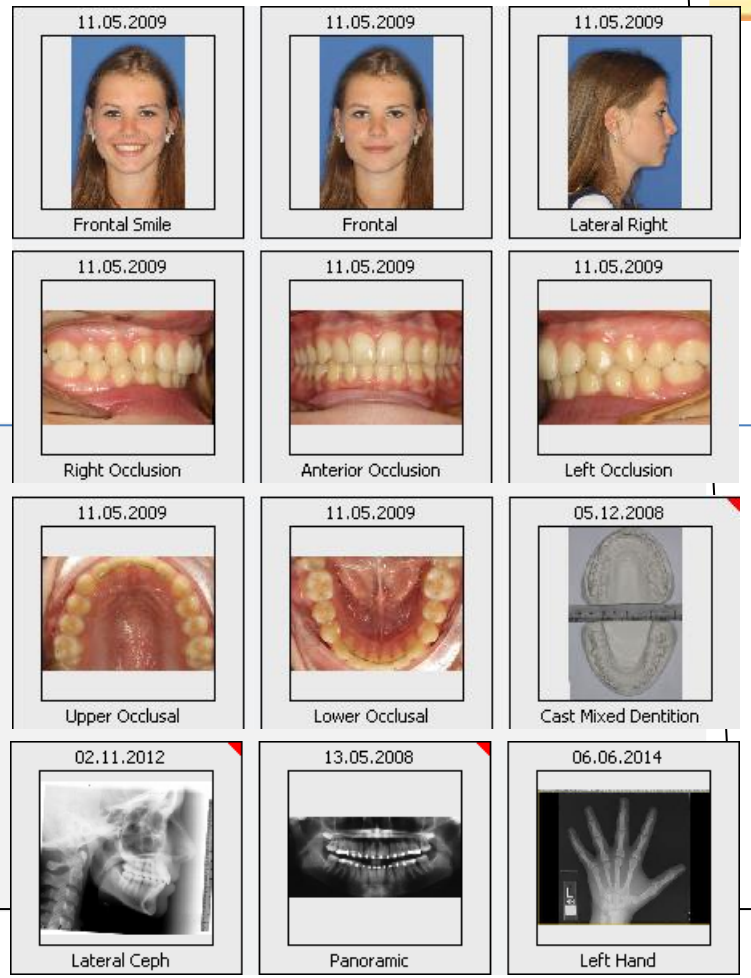
[67 pre-defined 2D Image Types]



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[8 pre-defined 3D Image Types]

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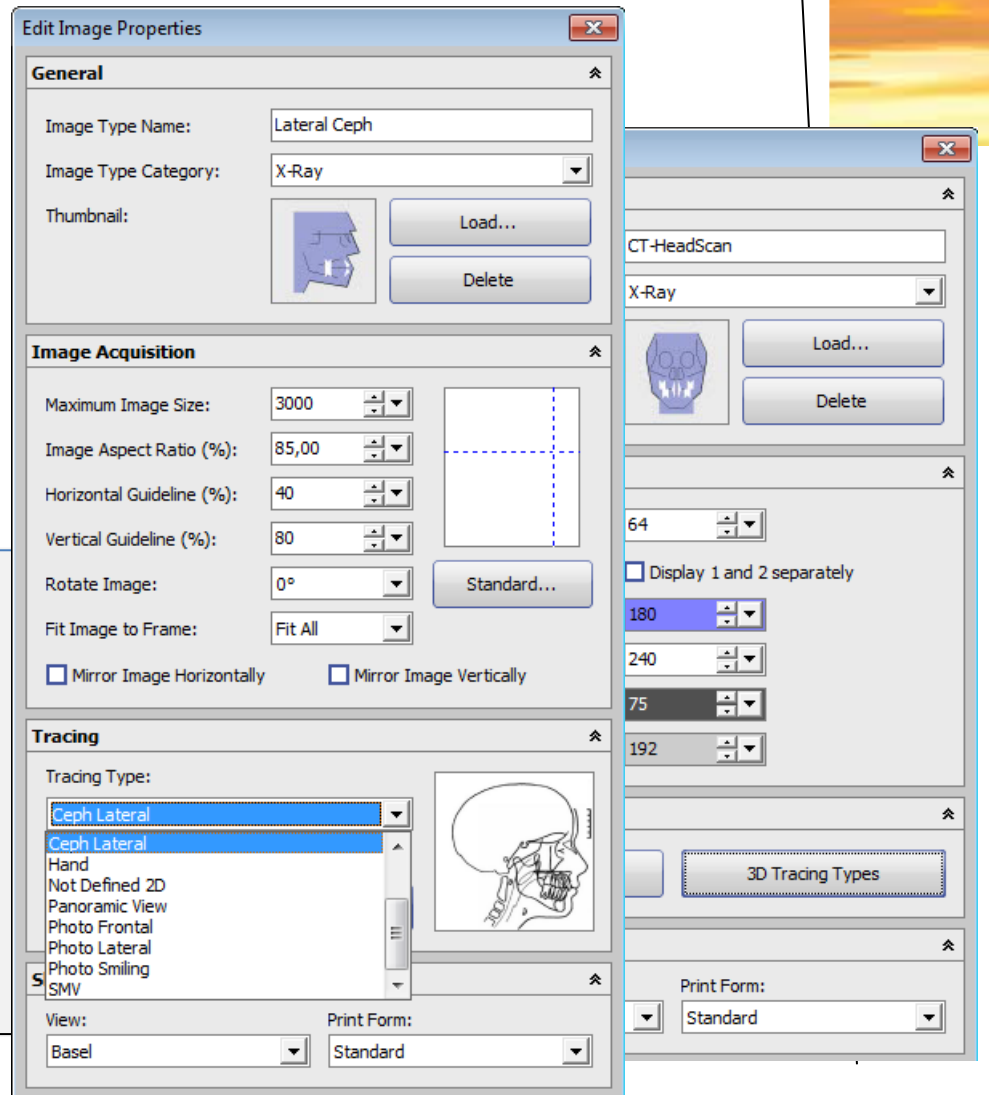

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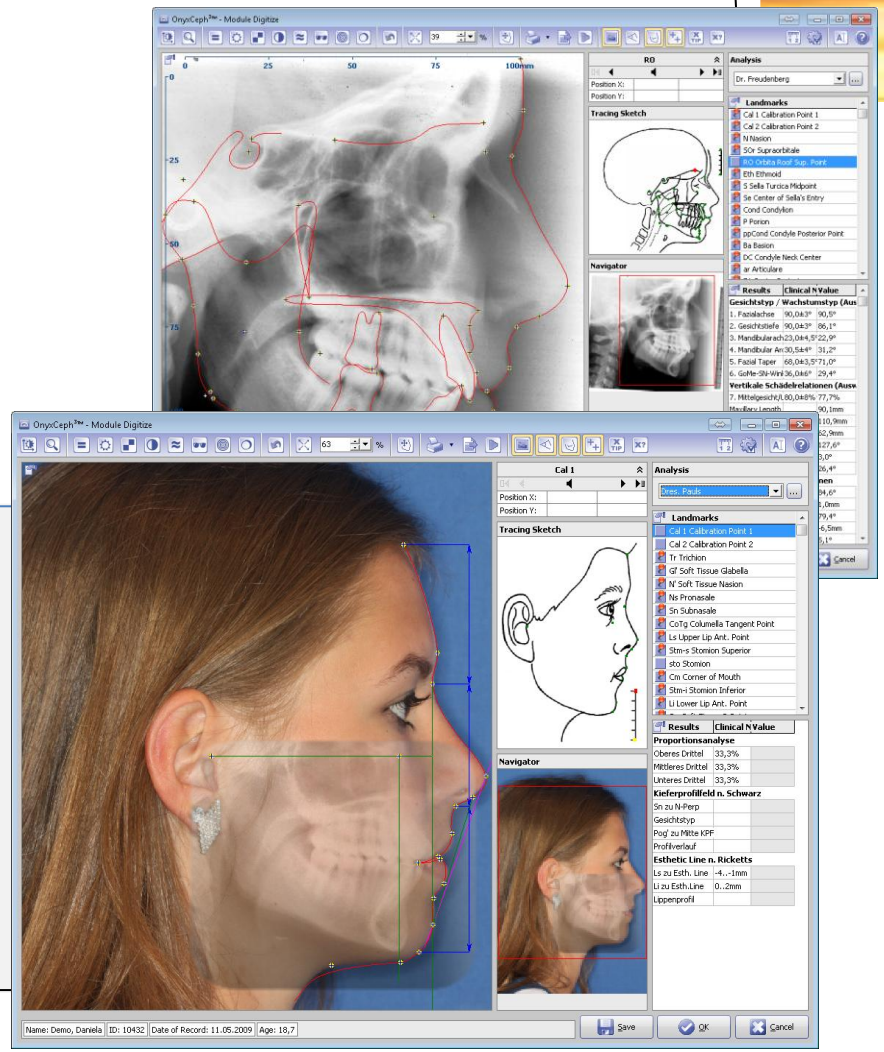
[12 Tracing Types 2D]



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[5 Tracing Types 3D]

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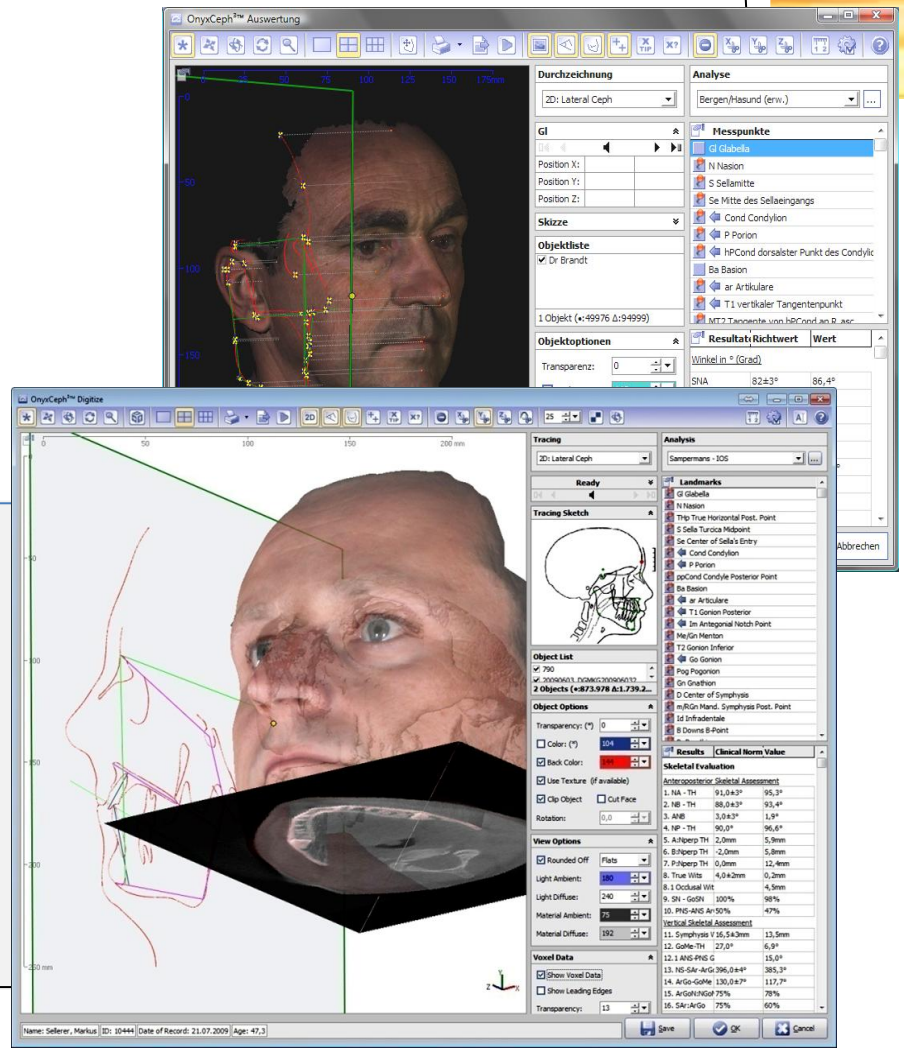

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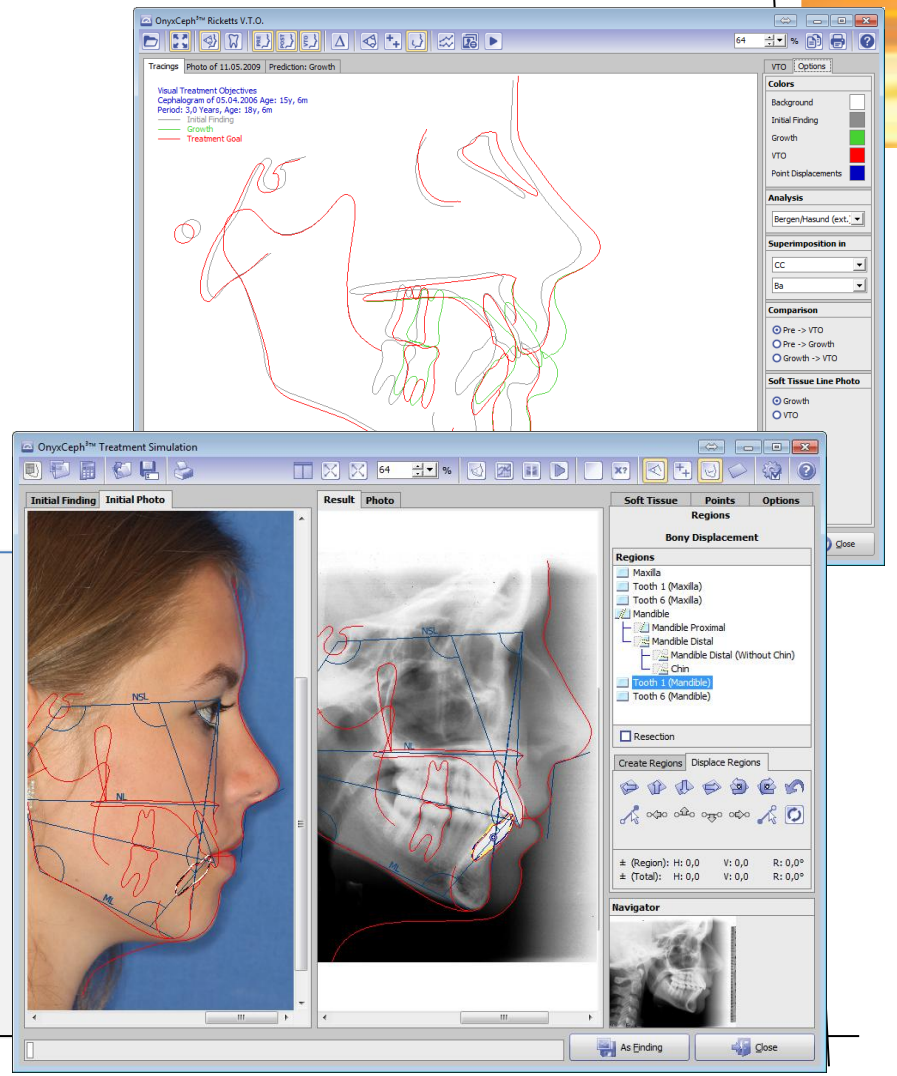

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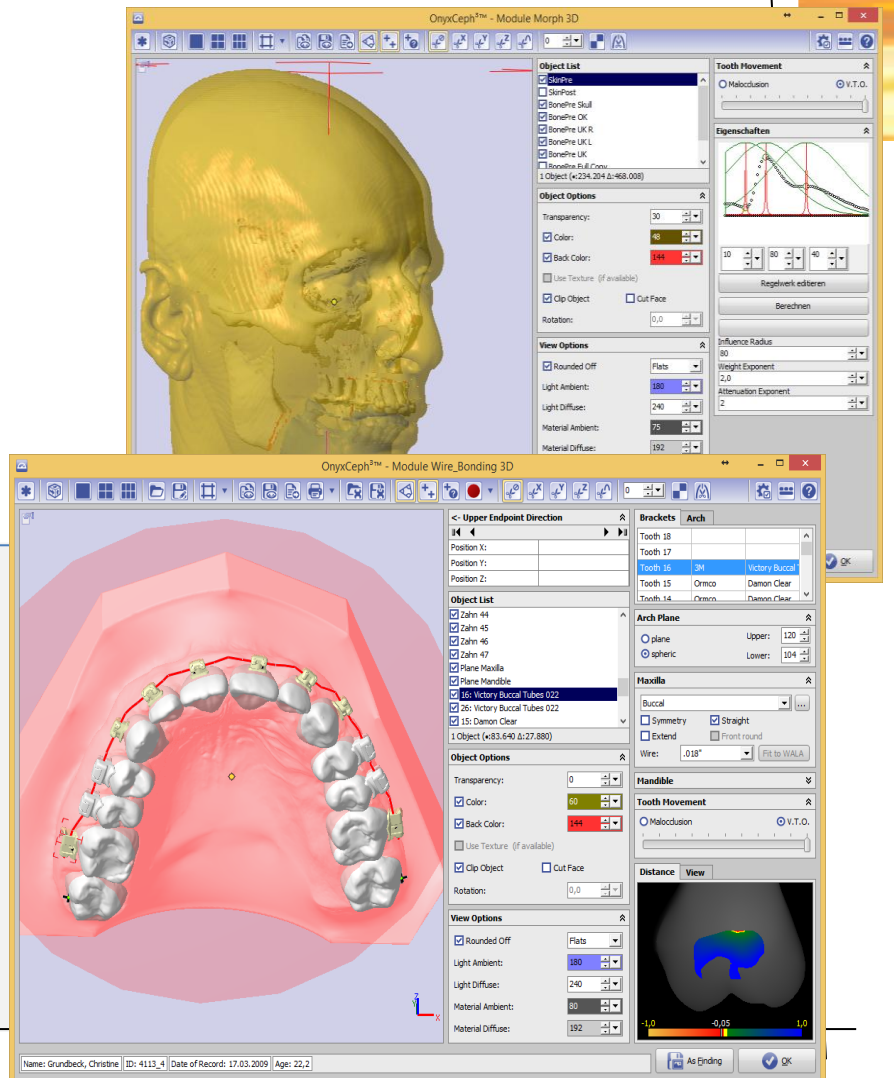

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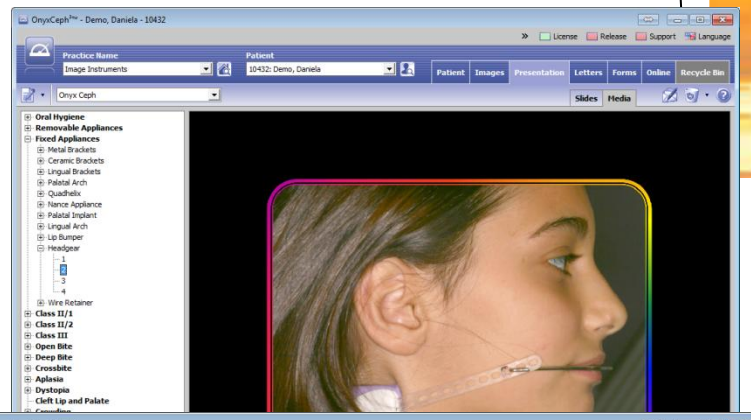

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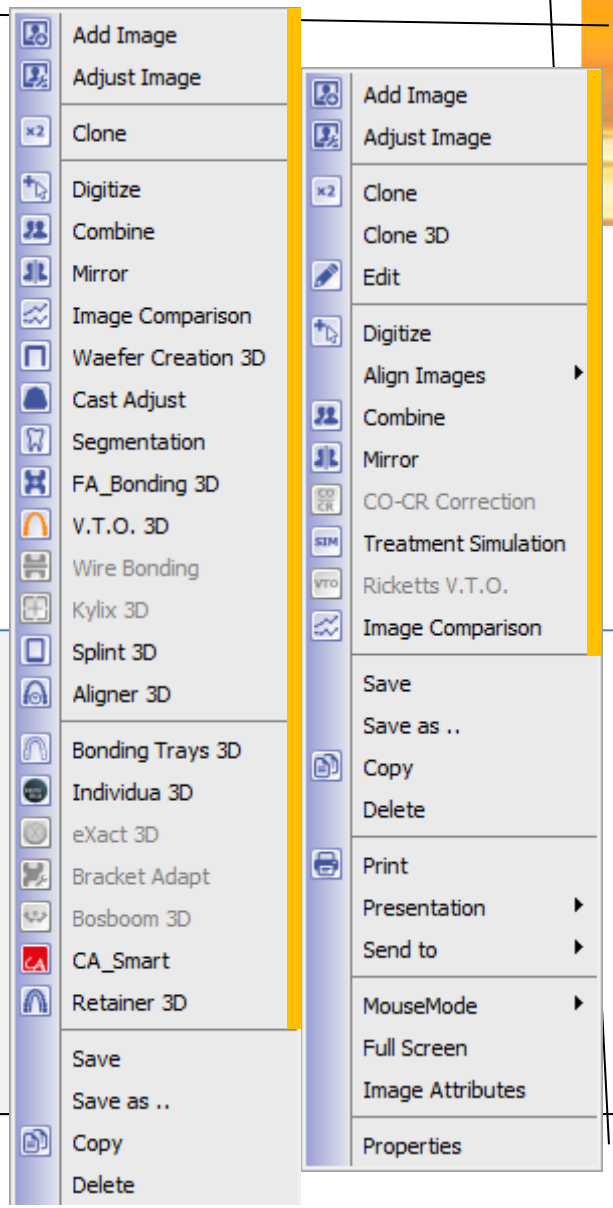

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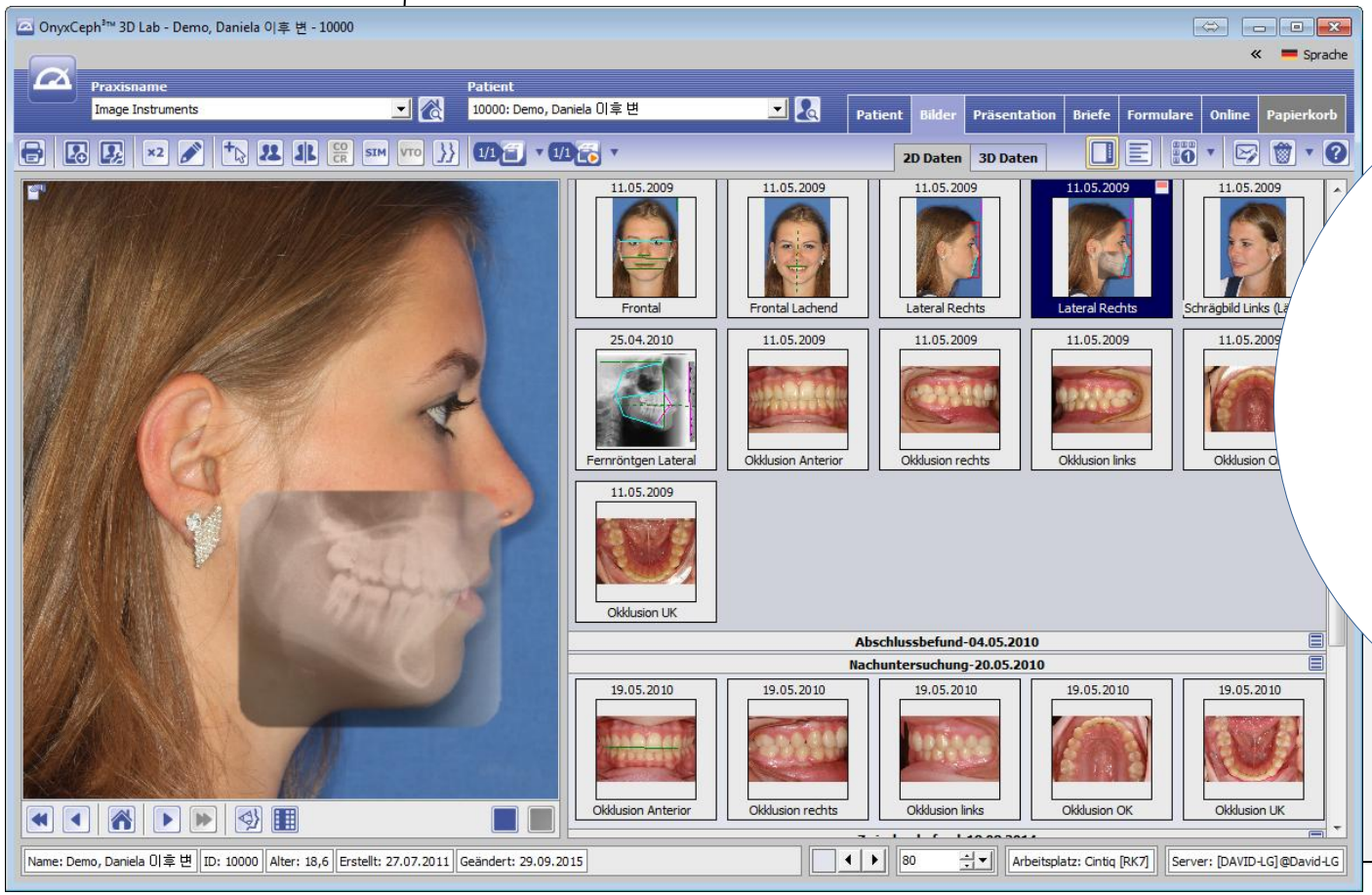

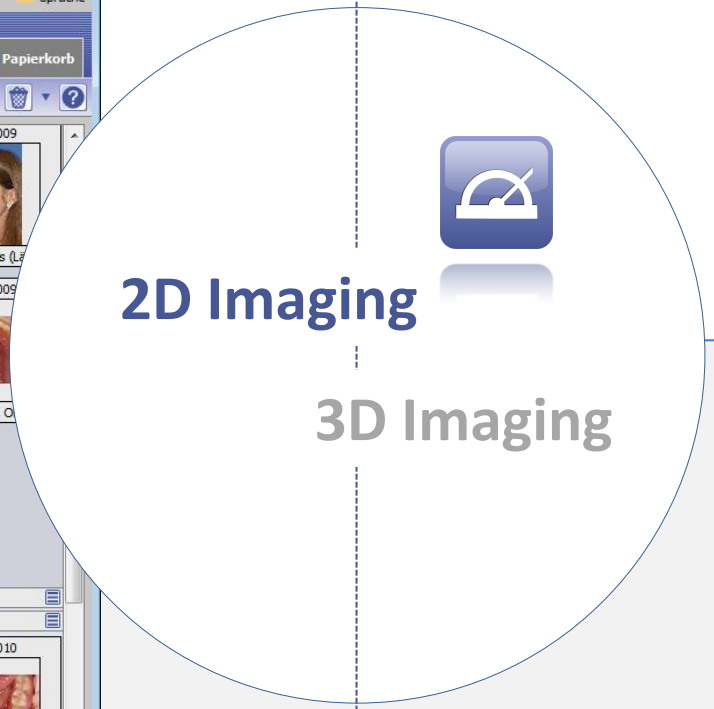

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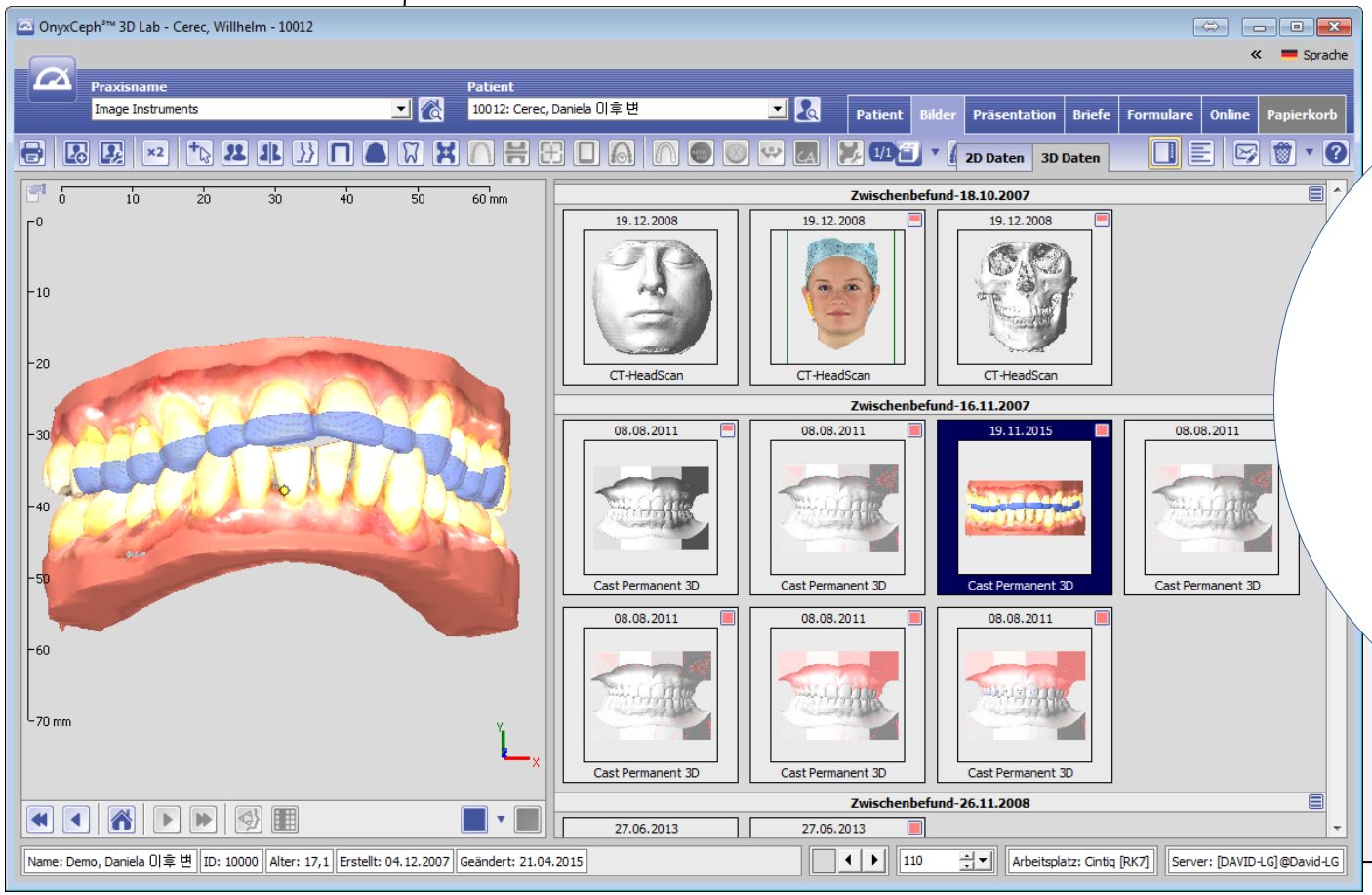

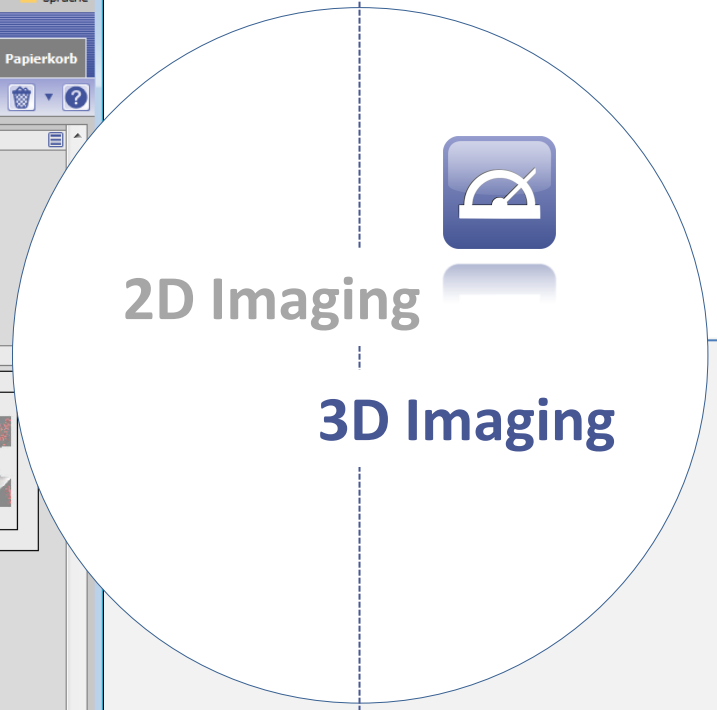

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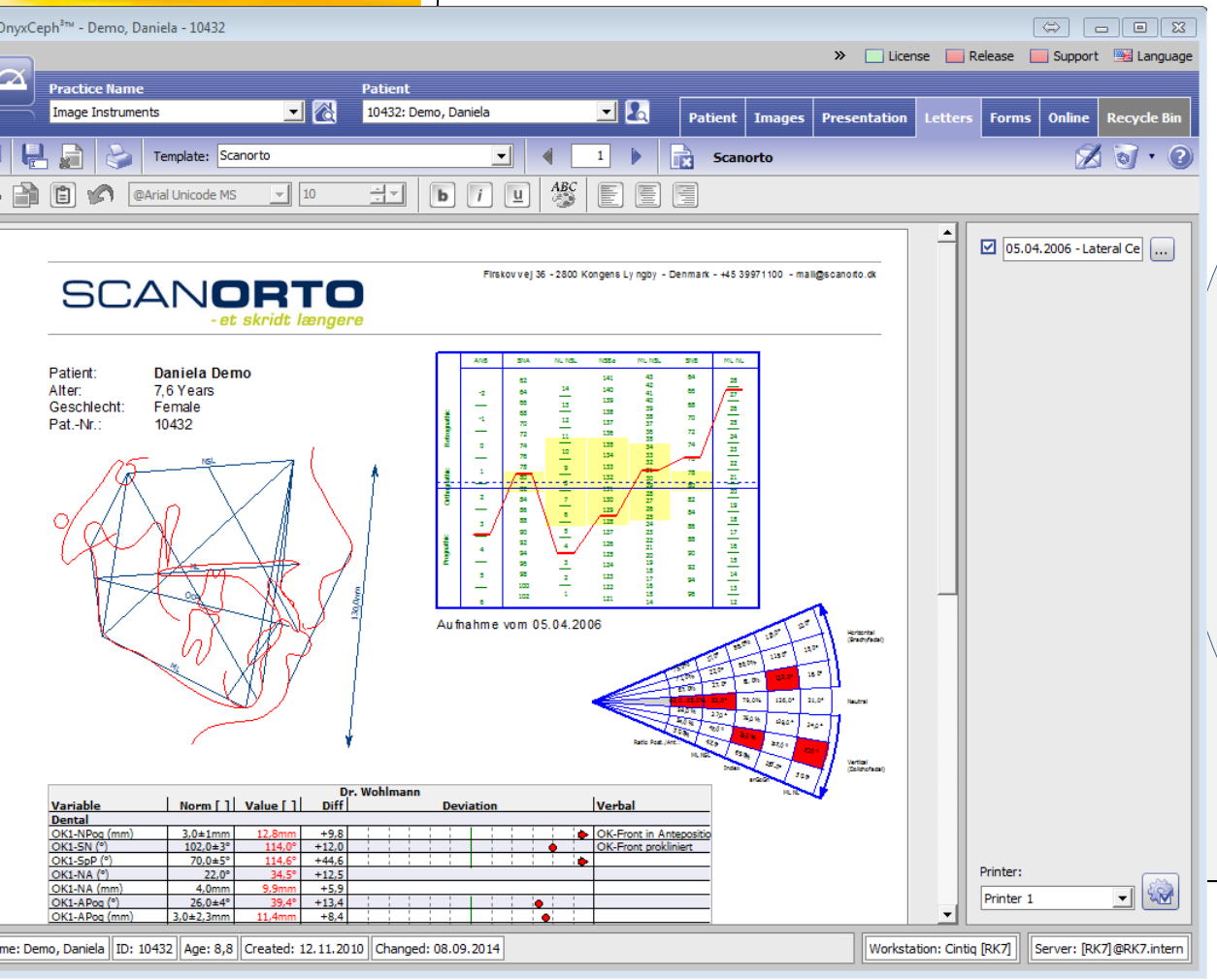
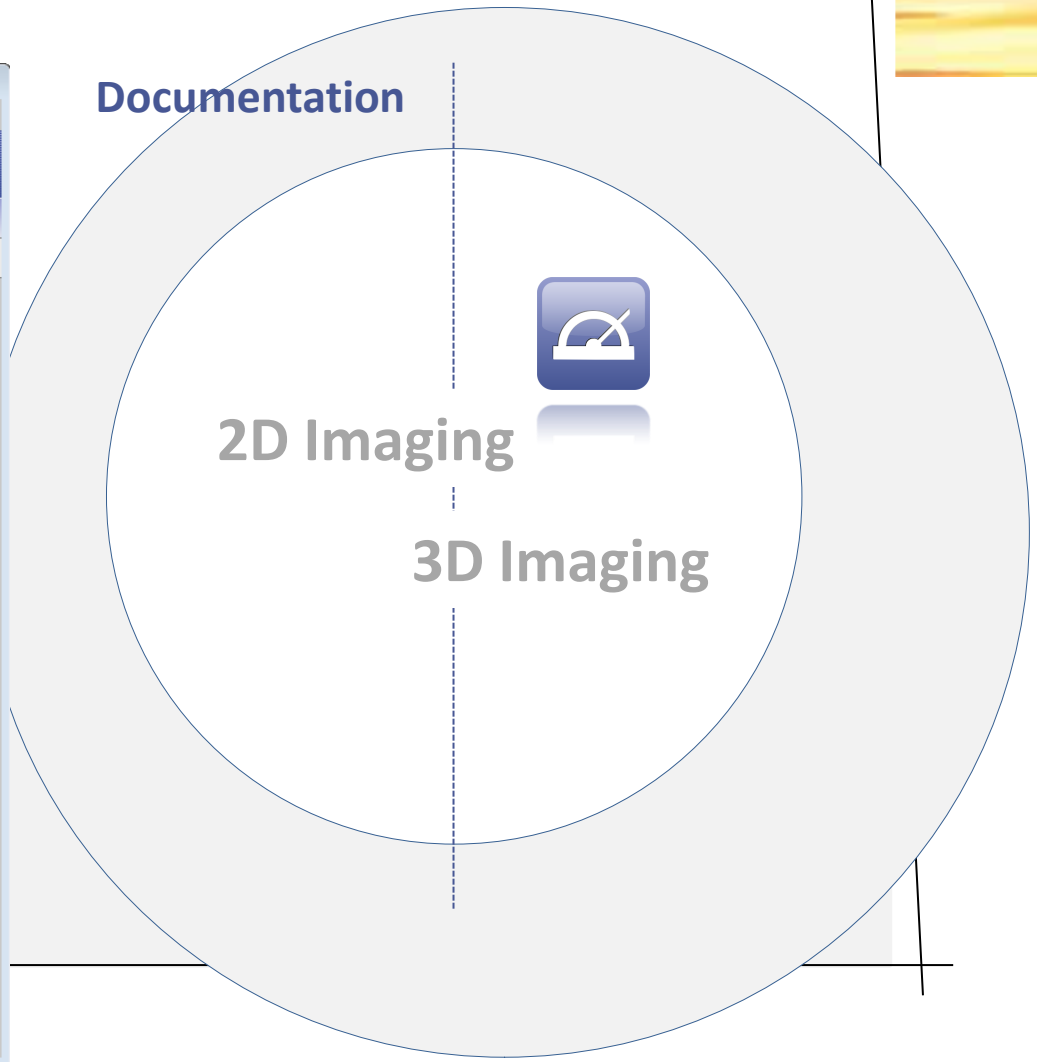




yxCeph³™

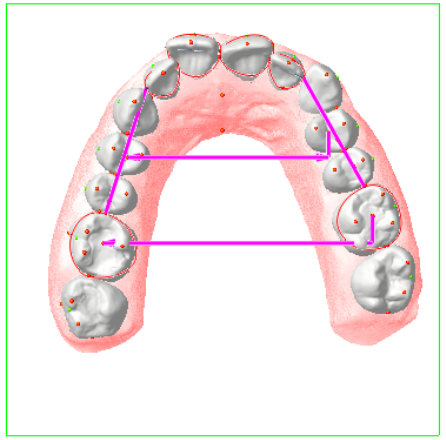
Dr. med. dent. Peter Blattner

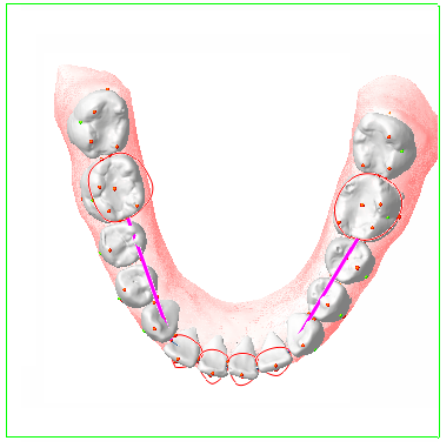
Gertenbachstr.30 - 42899 Remscheid
Tel: 02191-50649 - Email: praxis@dr-blattnet.de

SCANORTO
- et skridt længere

Patient: Oberlech, Inga - 19.09.1996 - Female
Pat.-ID: 10005

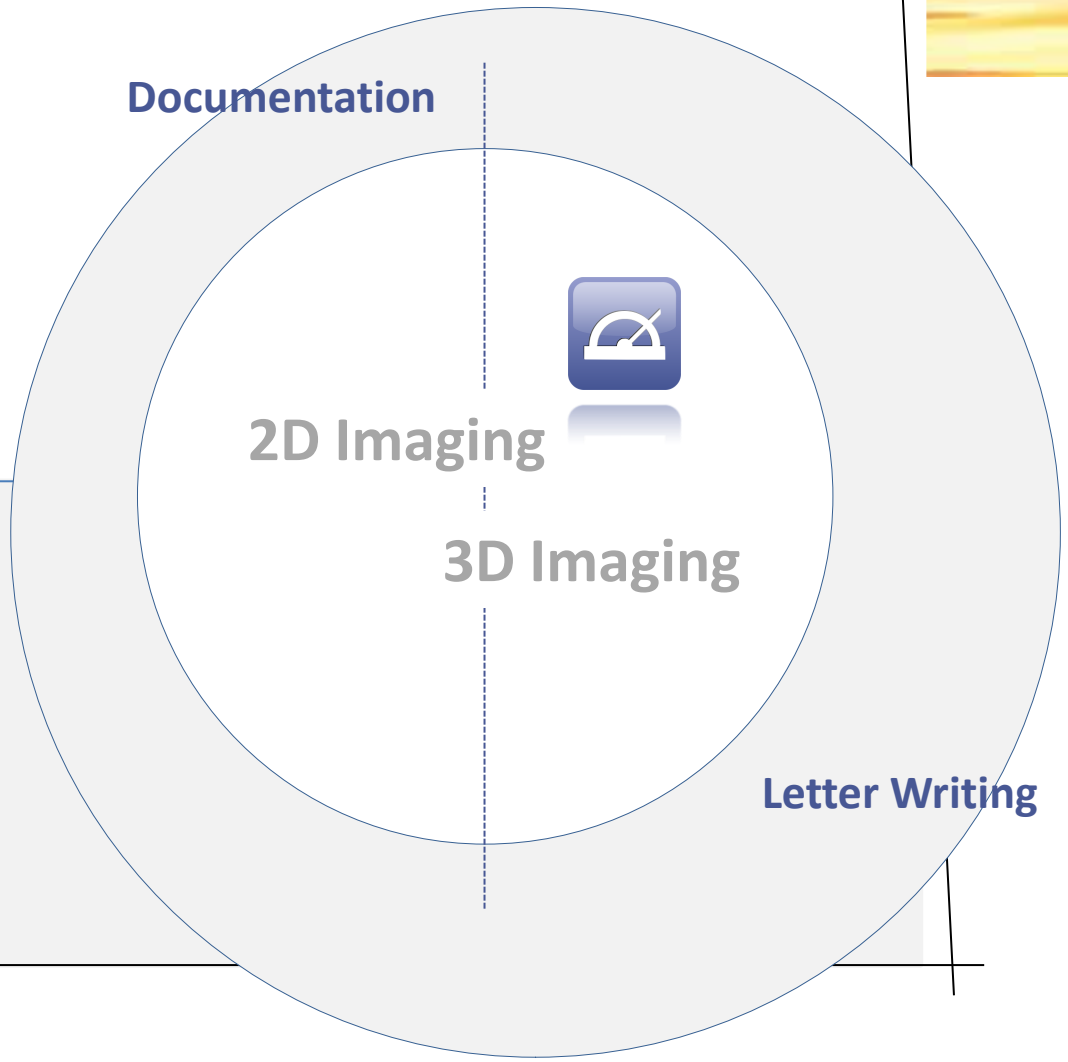
Age: 17,5 Years
Initial: 23.03.2014
Analysis: Weise





Weise			
Variable	Norm [ ]	Value [ ]	Diff
SImax		30,3mm	
Lup	17,8mm		
Llo	15,8mm		
aw max	37,2mm	32,7mm	-4,5
aw mand	37,2mm		
pw max	49,7mm	43,9mm	-5,8
pw mand	49,7mm		
SZrmax	21,8mm	21,4mm	-0,4
D SZrmax		-0,4mm	
SZlmax	21,8mm	20,3mm	-1,5
D SZlmax		-1,5mm	
ASmax	30,3mm		
D ASmax			
D max			
SZrmand	21,1mm	21,1mm	0,0
D SZrmand		0,0mm	
SZlmand	21,1mm	21,2mm	+0,1
D SZlmand		+0,1mm	
ASmand	21,5mm		
D ASmand			
D mand			

Pont Index			
Variable	Norm [ ]	Value [ ]	Diff
SImax		30mm	
aw max	38mm	33mm	-5
aw mand	38mm		
pw max	47mm	44mm	-3
pw mand	47mm		



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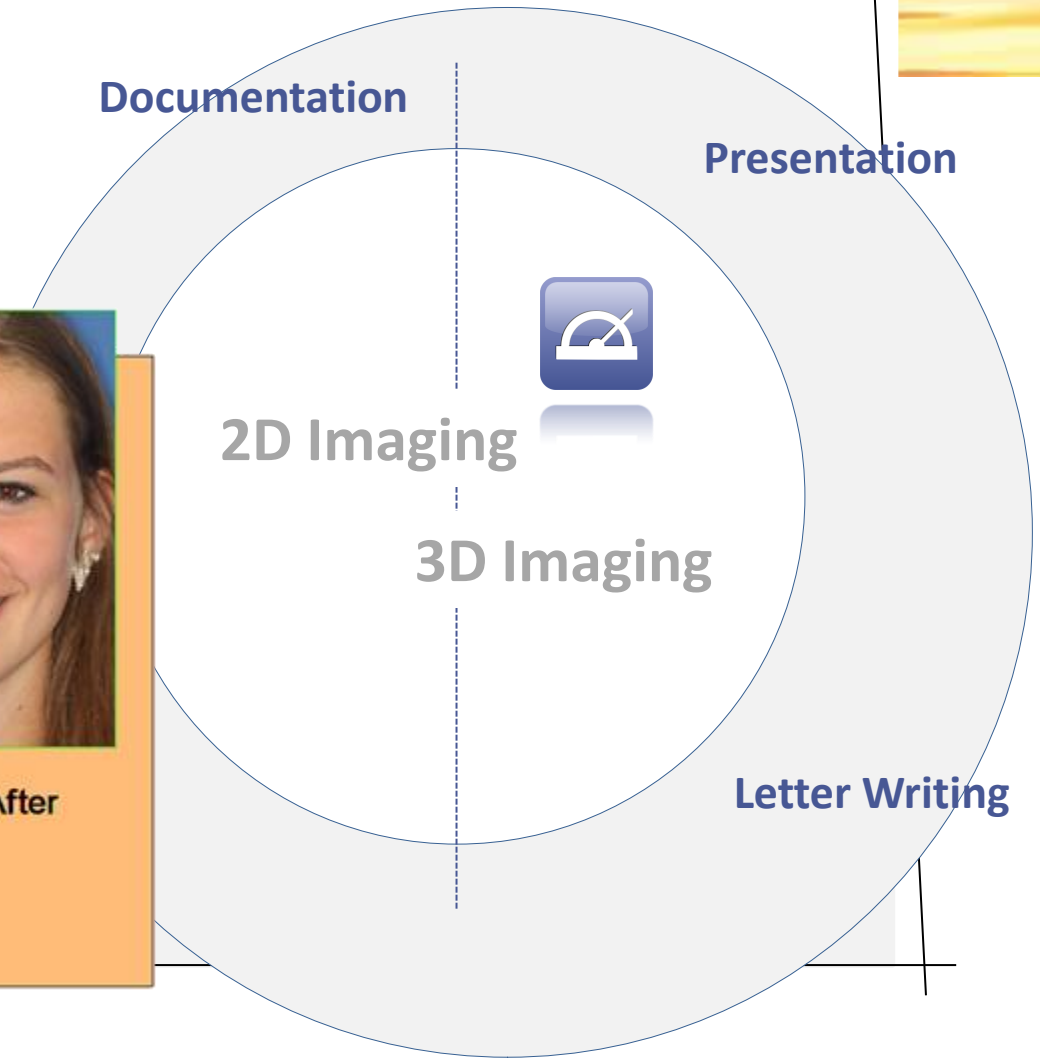

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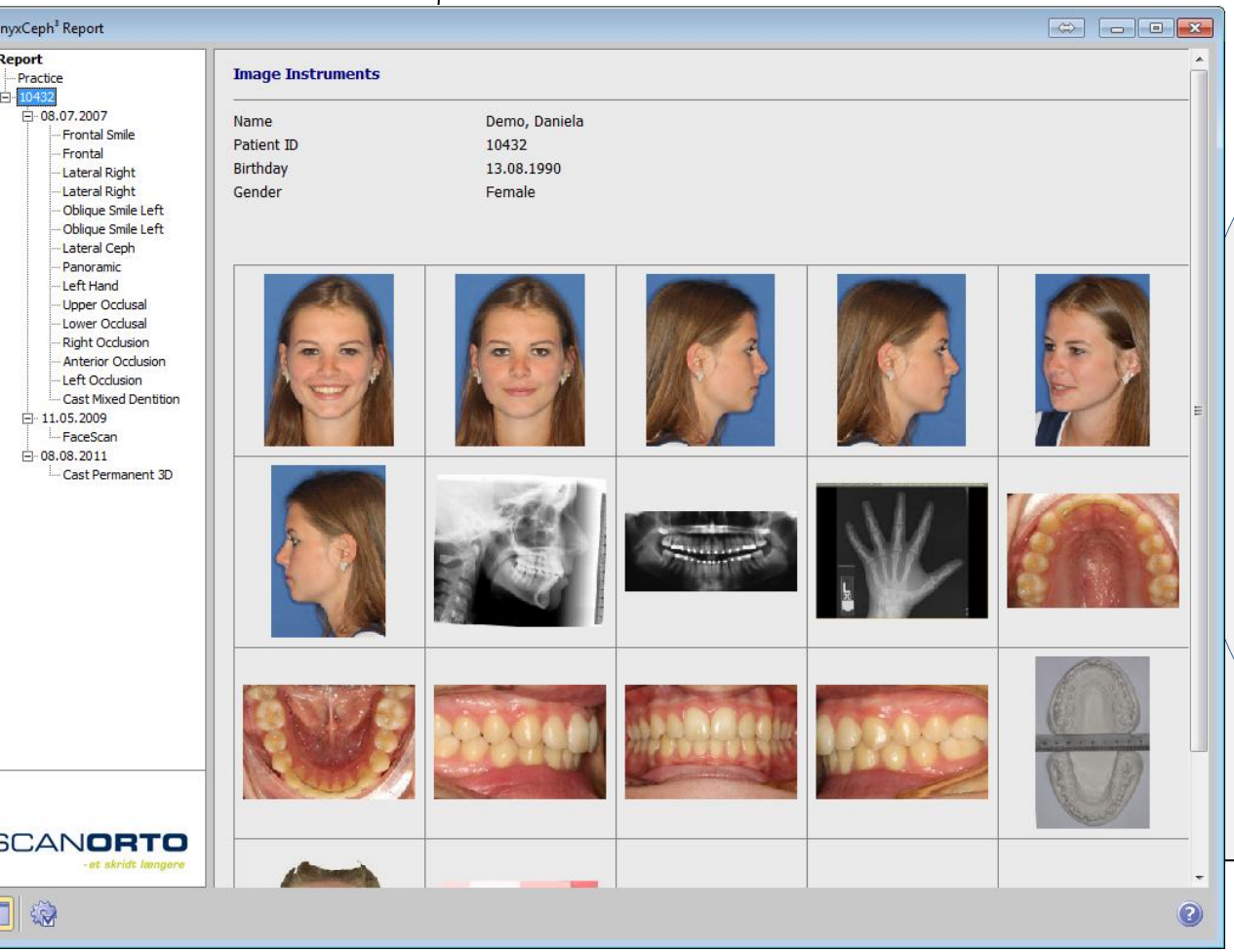

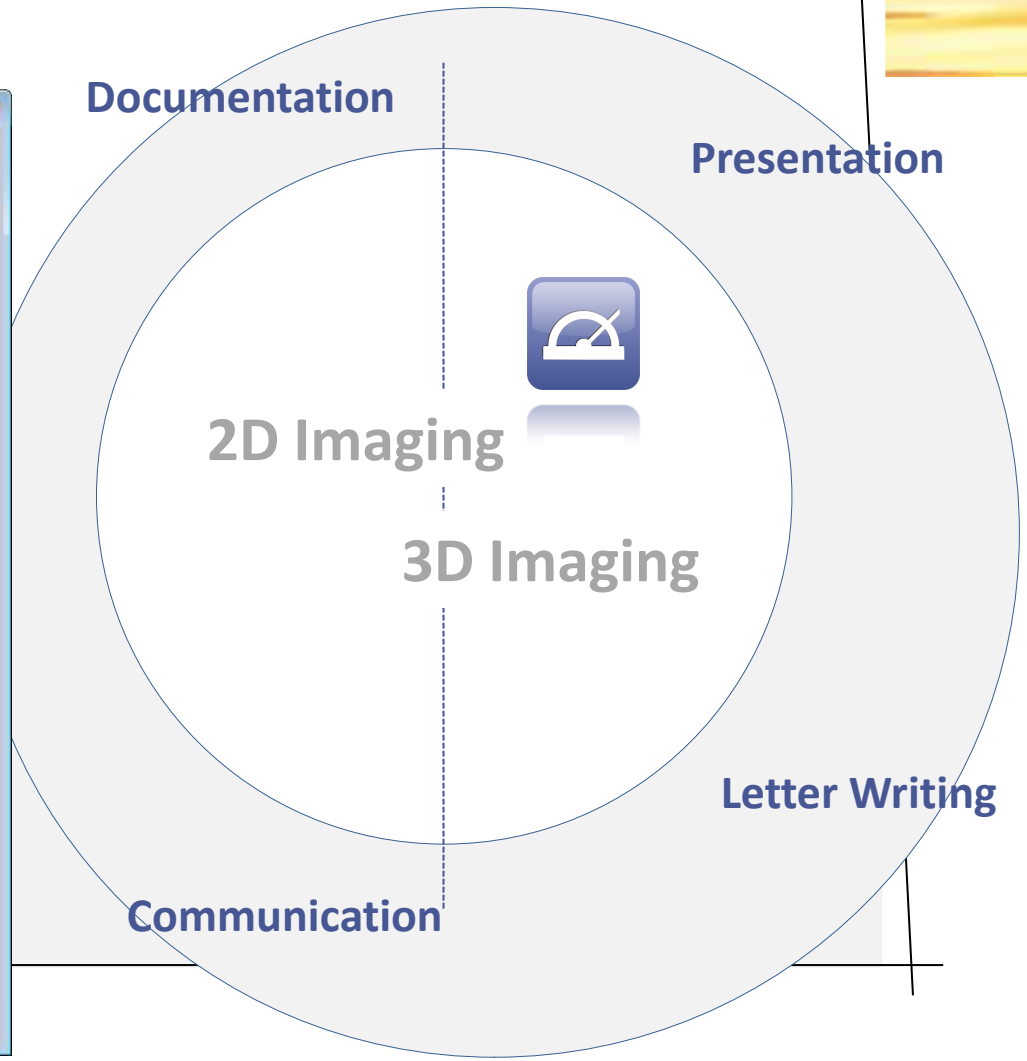

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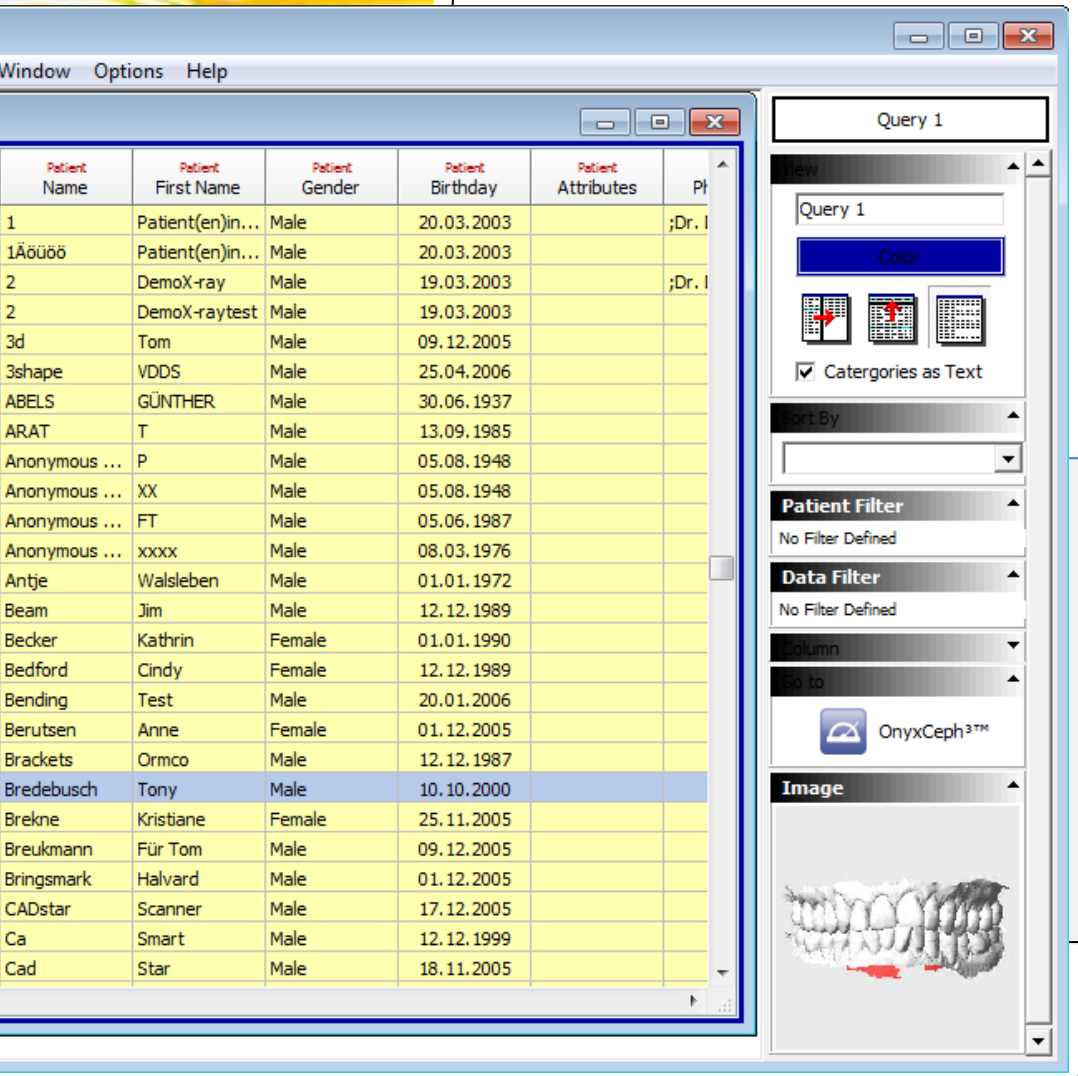

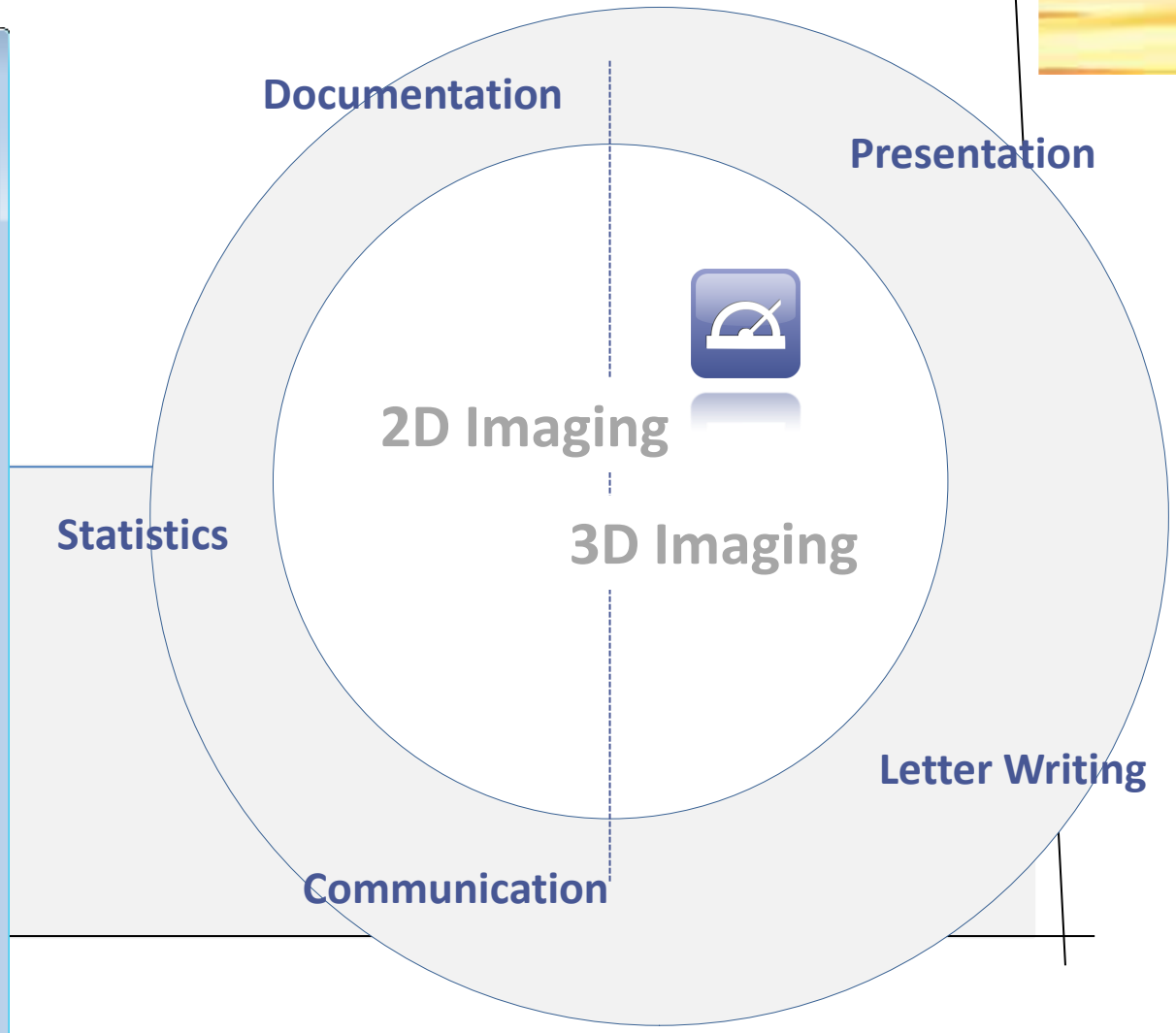

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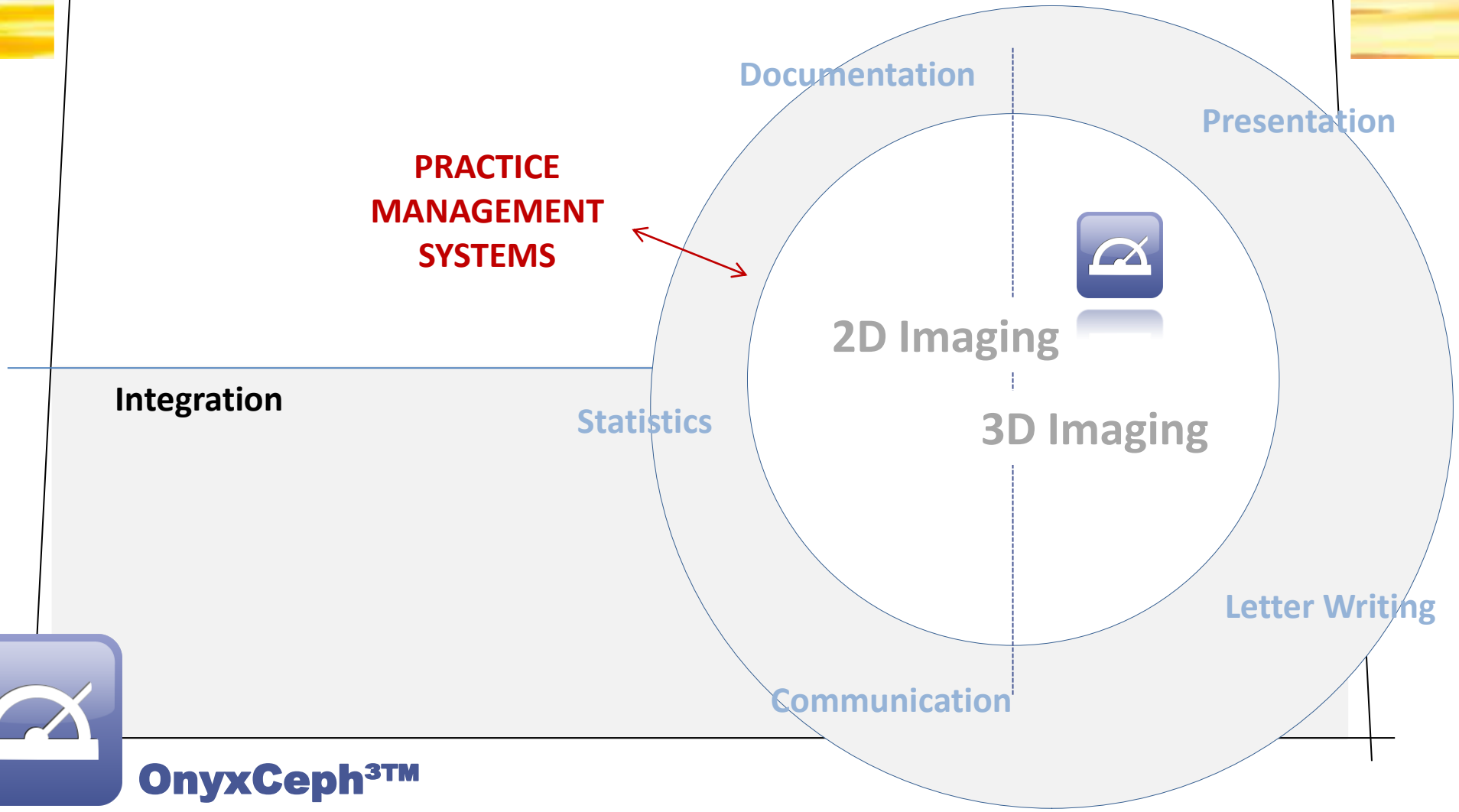

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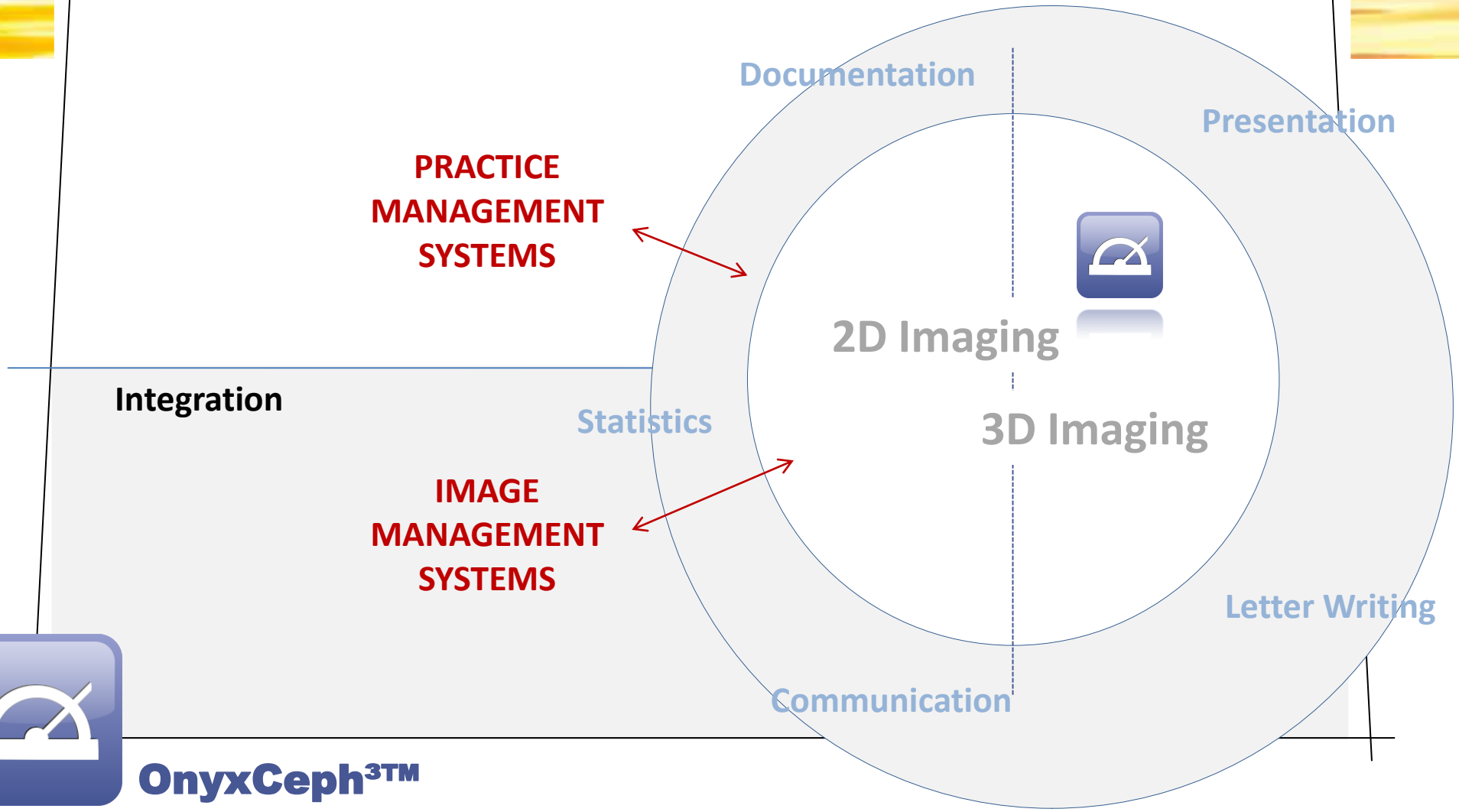

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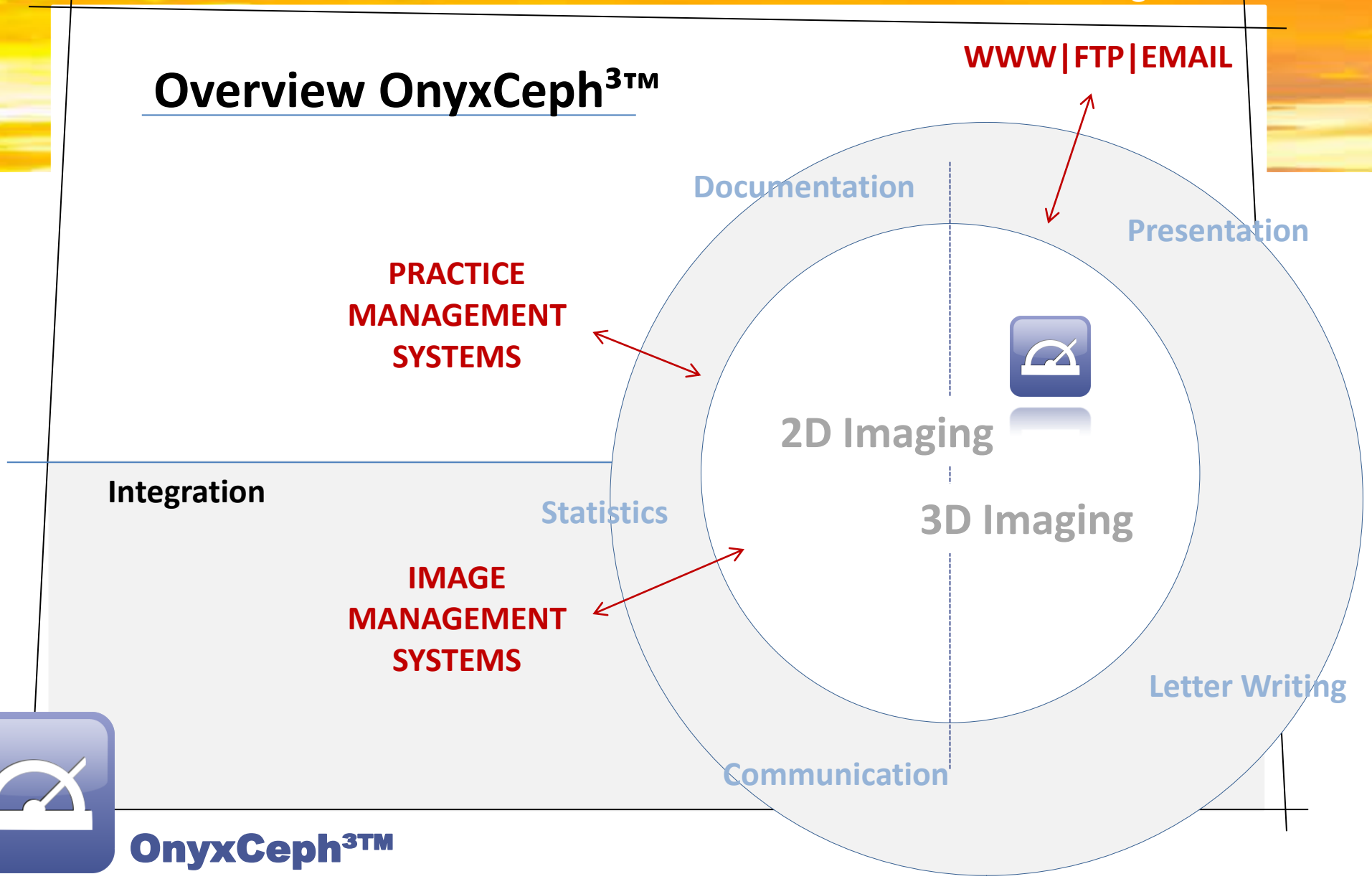

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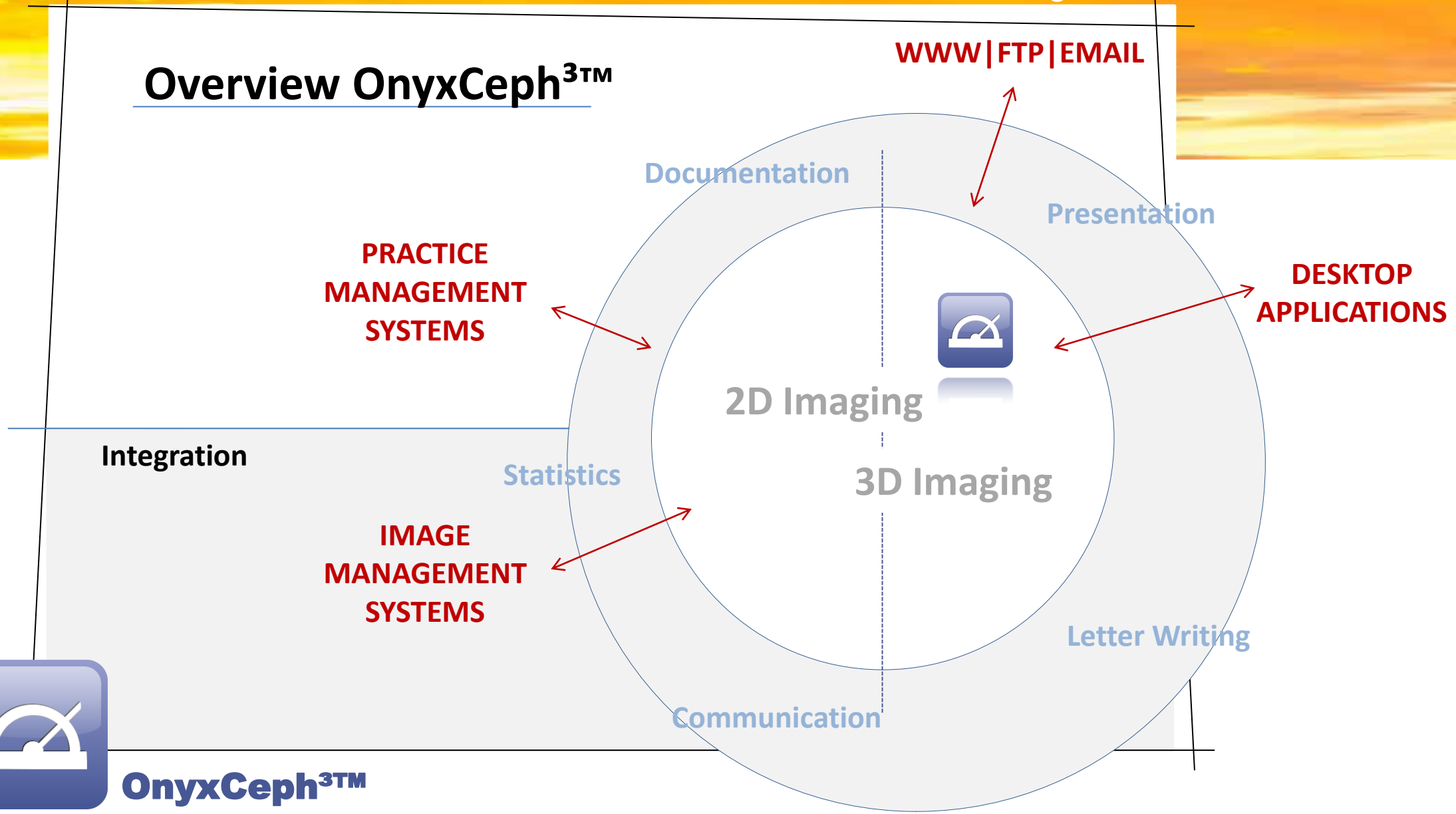

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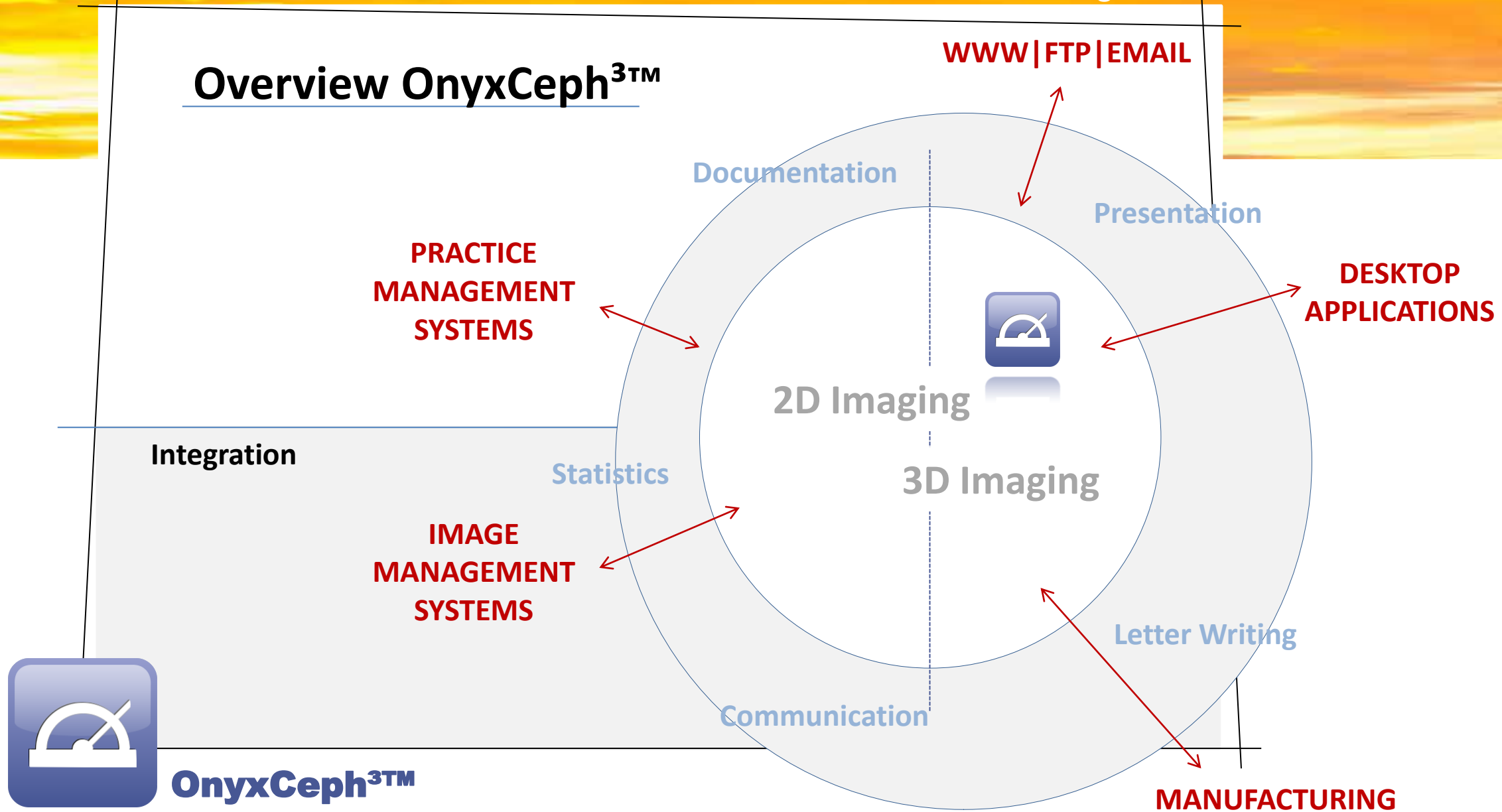

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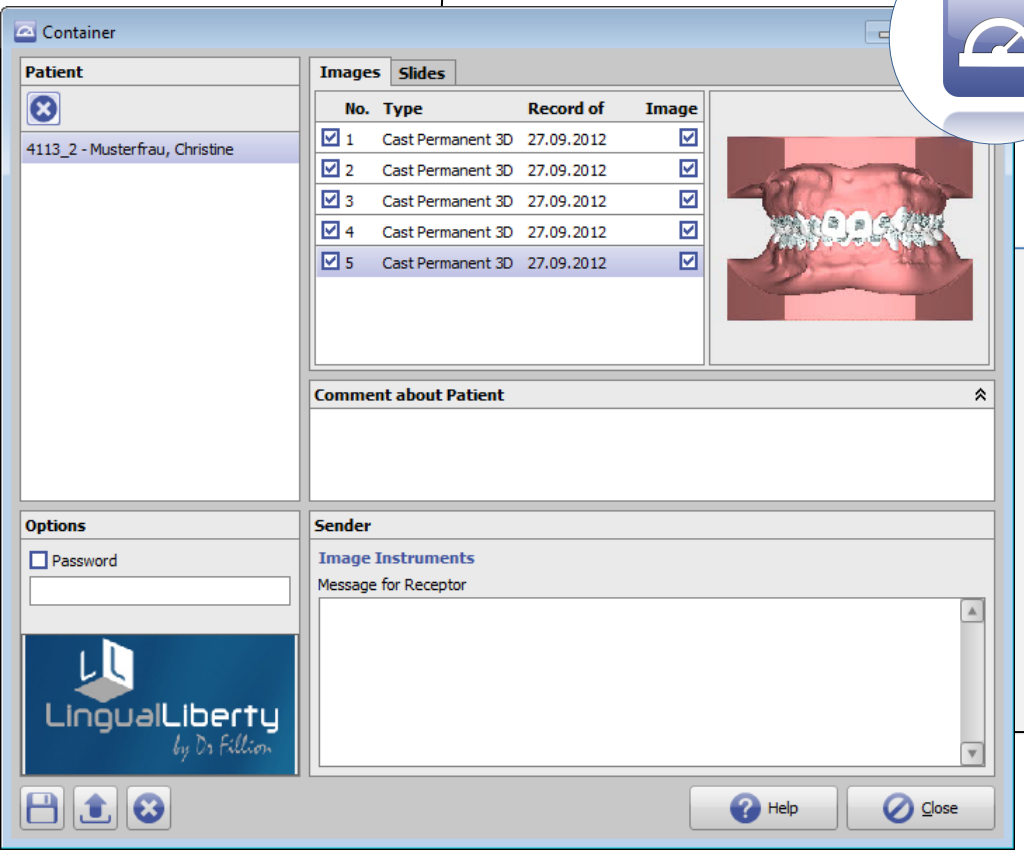

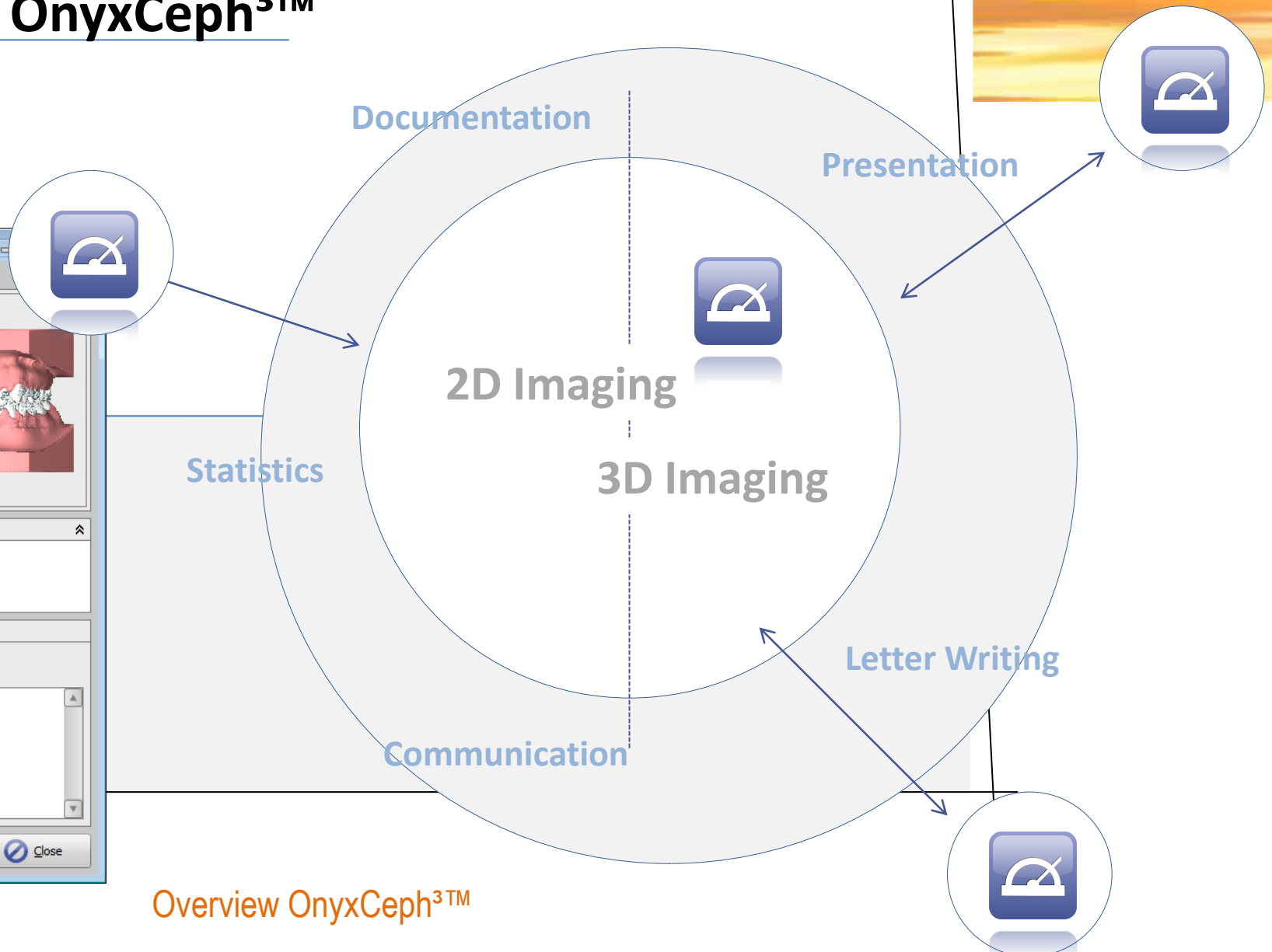

Overview OnyxCeph³™

Imaging Modules

2D Imaging

3D Imaging

OnyxCeph³™

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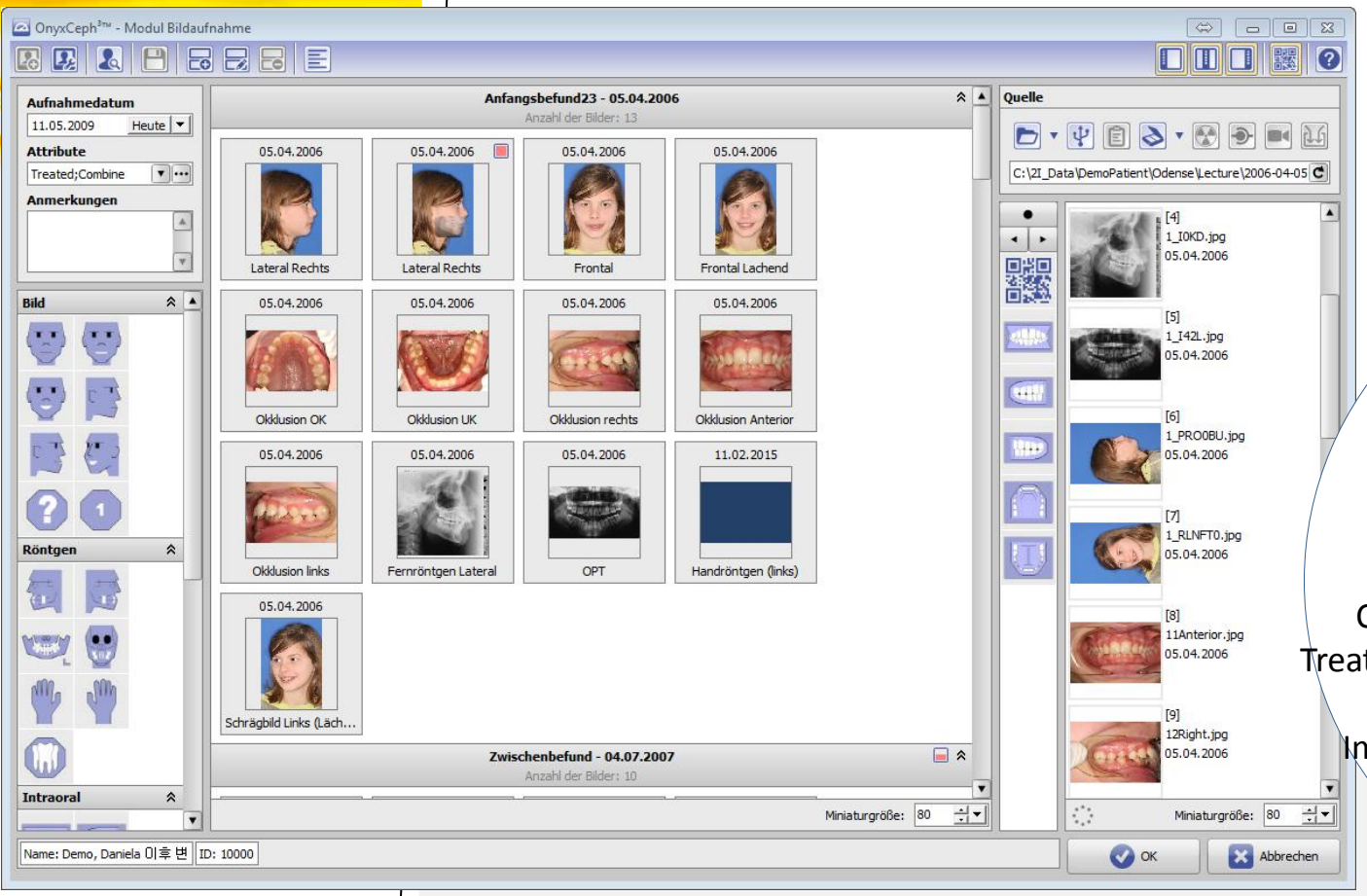
Imaging Modules

Add Image
Adjust Image
Edit
Digitize
Combine
Mirror
CO|CR Correction
Treatment Simulation
Ricketts V.T.O.
Image Comparison

Add Image
Adjust Image
Digitize
Combine
Mirror
Treatment Simulation 3D
Image Comparison
Cast Adjust
Segmentation
FA_Bonding
V.T.O.3D
Wire Bonding
Kylix 3D
Bonding Trays 3D
Splint 3D
Bracket Adapt
Aligner 3D
Retainer 3D
Waefer Creation 3D

OnyxCeph³™

2D Imaging



Add Image
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CO|CR Correction
Treatment Simulation
Ricketts V.T.O.
Image Comparison

MODULES

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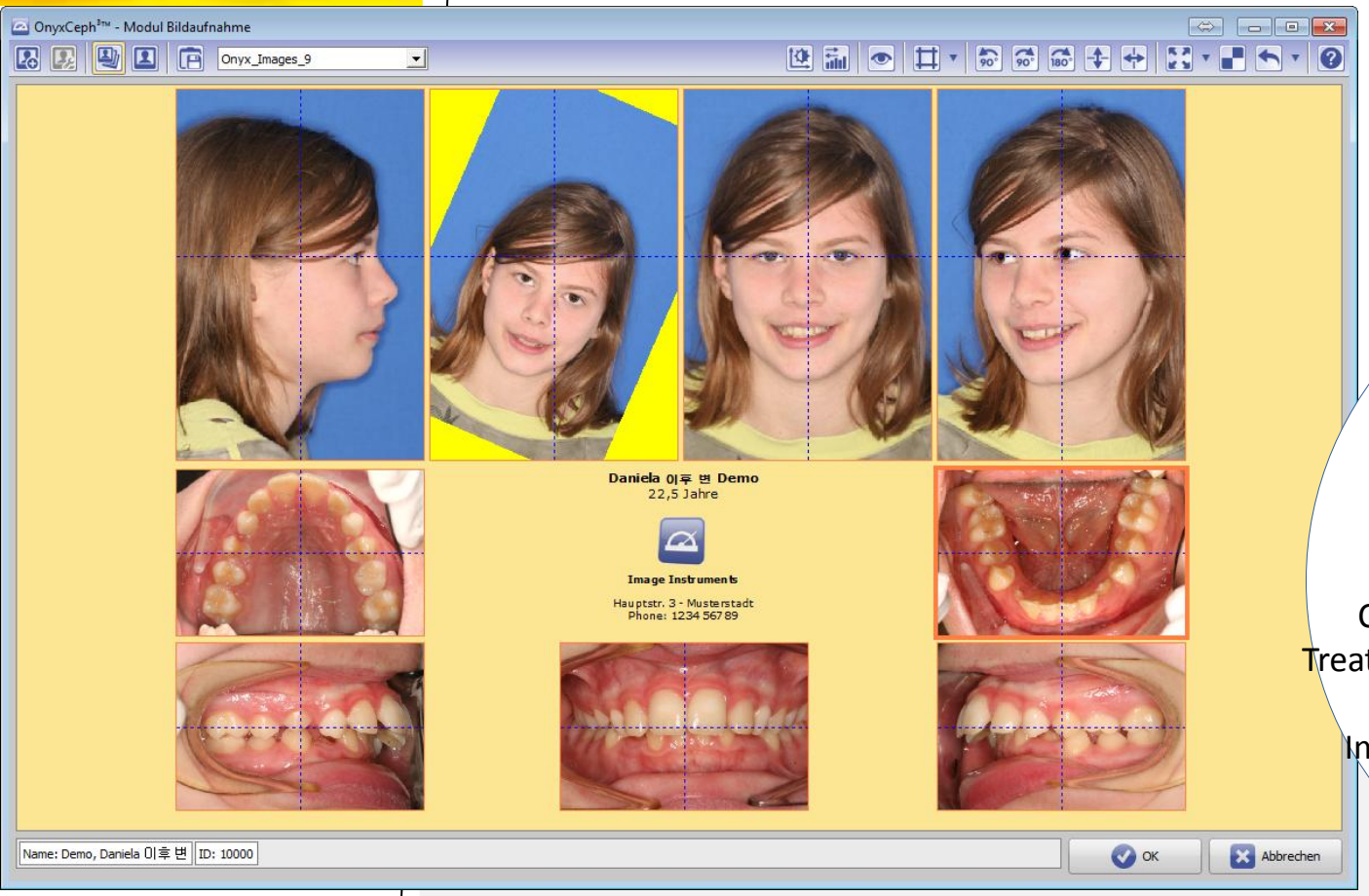

MODULES

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- **Adjust Image**
- Edit
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- Treatment Simulation
- Ricketts V.T.O.
- Image Comparison

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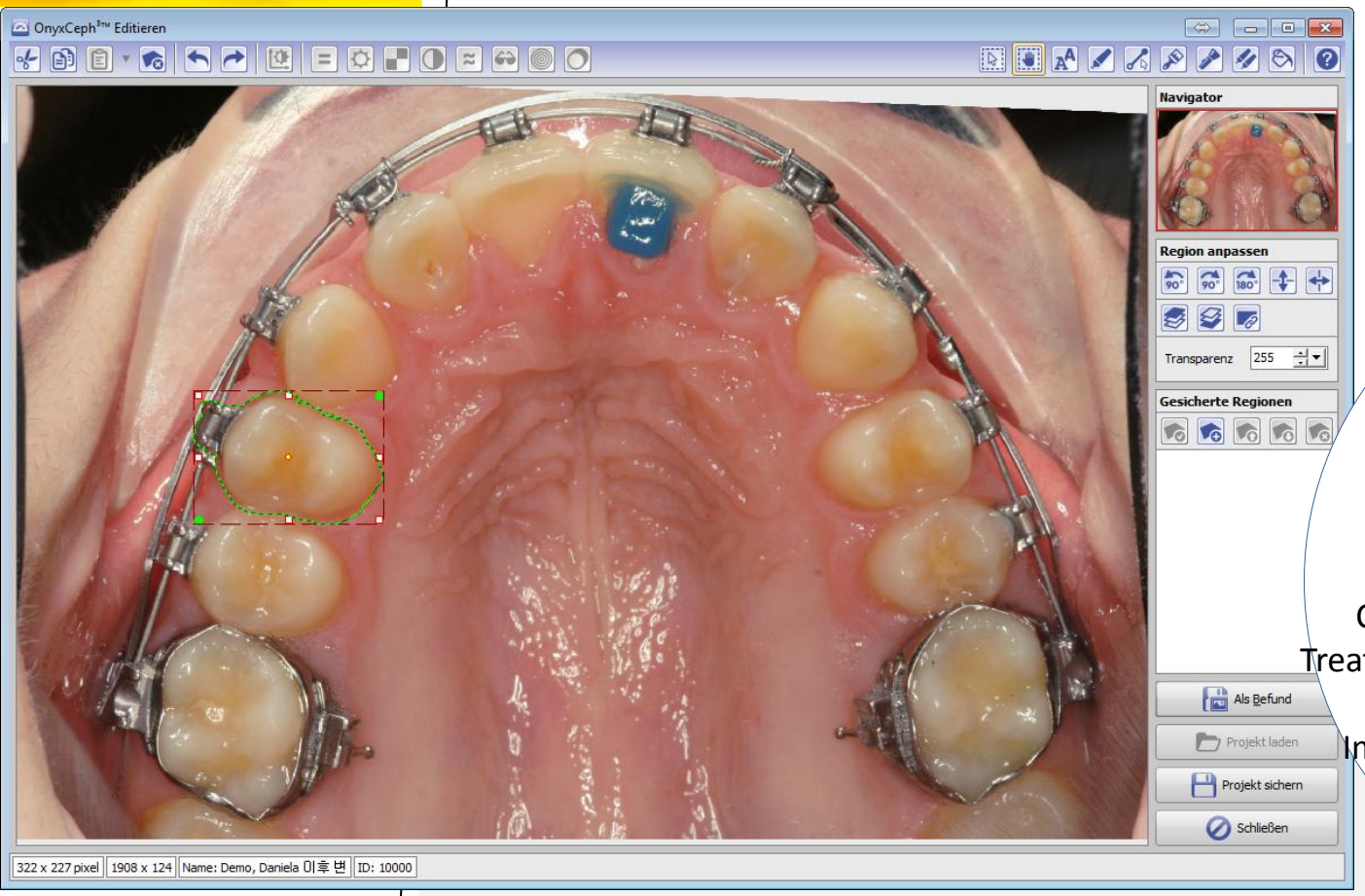

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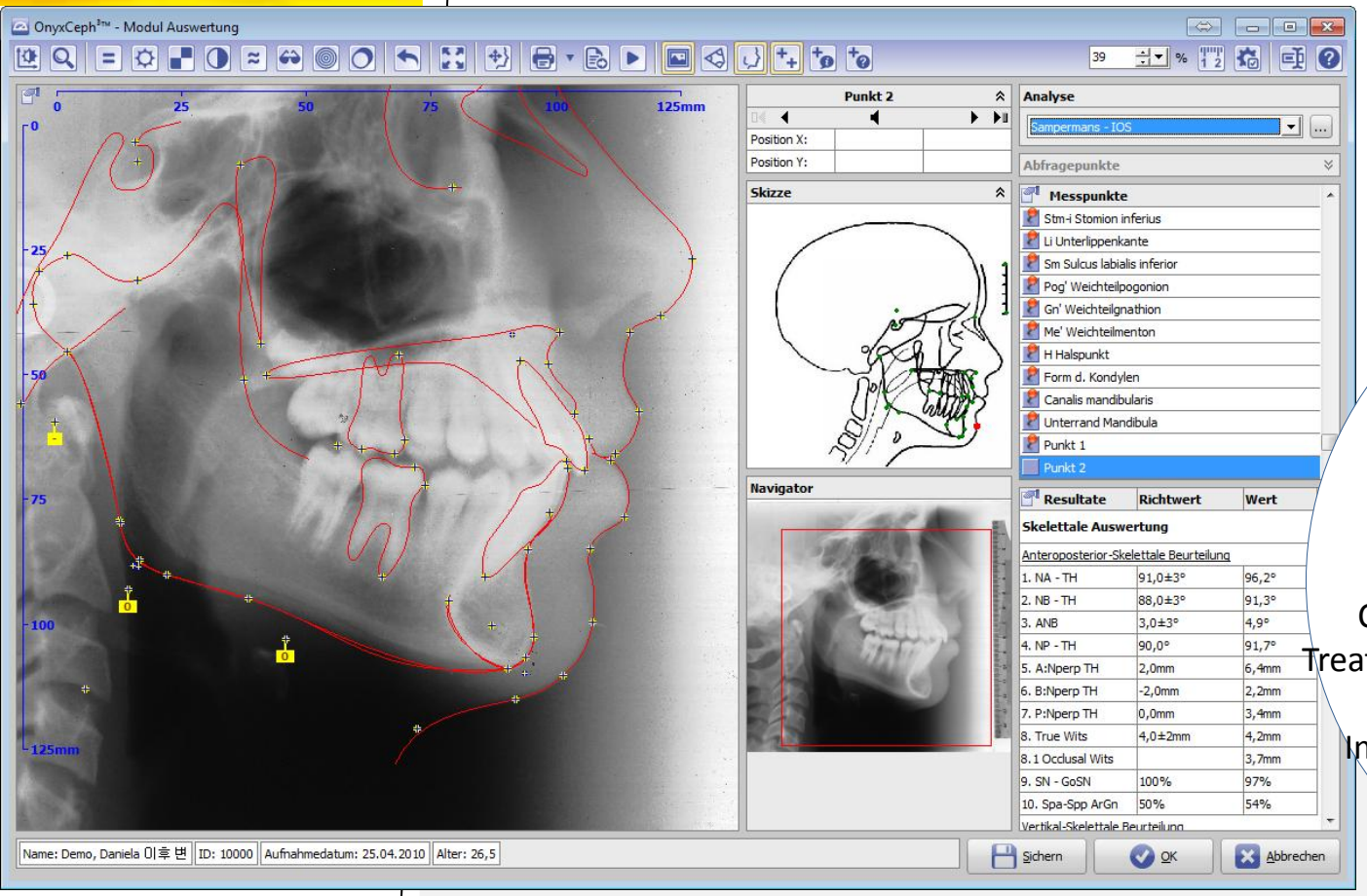
OnyxCeph³™

2D Imaging

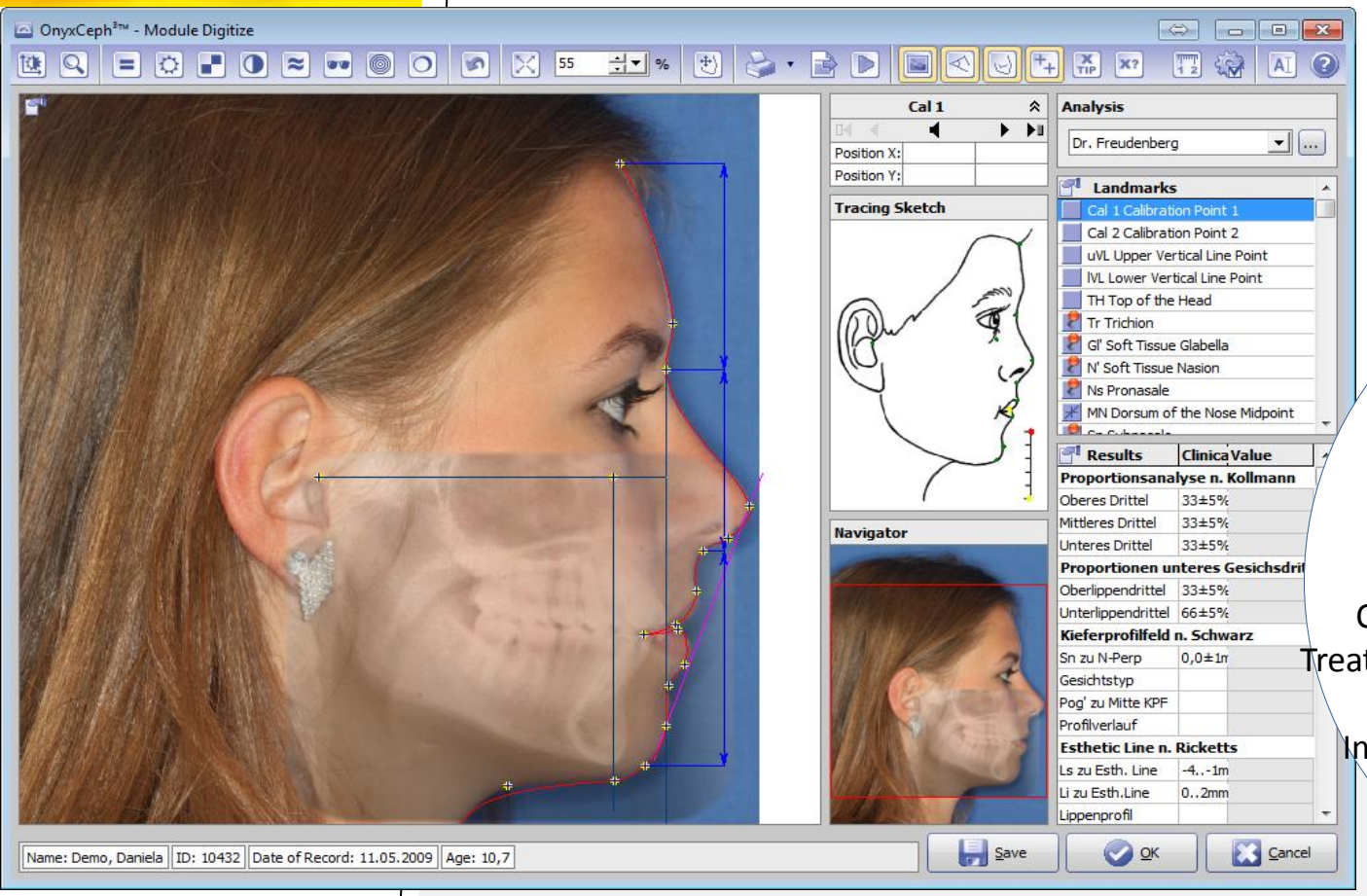


Add Image
Adjust Image
Edit
Digitize
Combine
Mirror
CO|CR Correction
Treatment Simulation
Ricketts V.T.O.
Image Comparison

MODULES

OnyxCeph³™

2D Imaging



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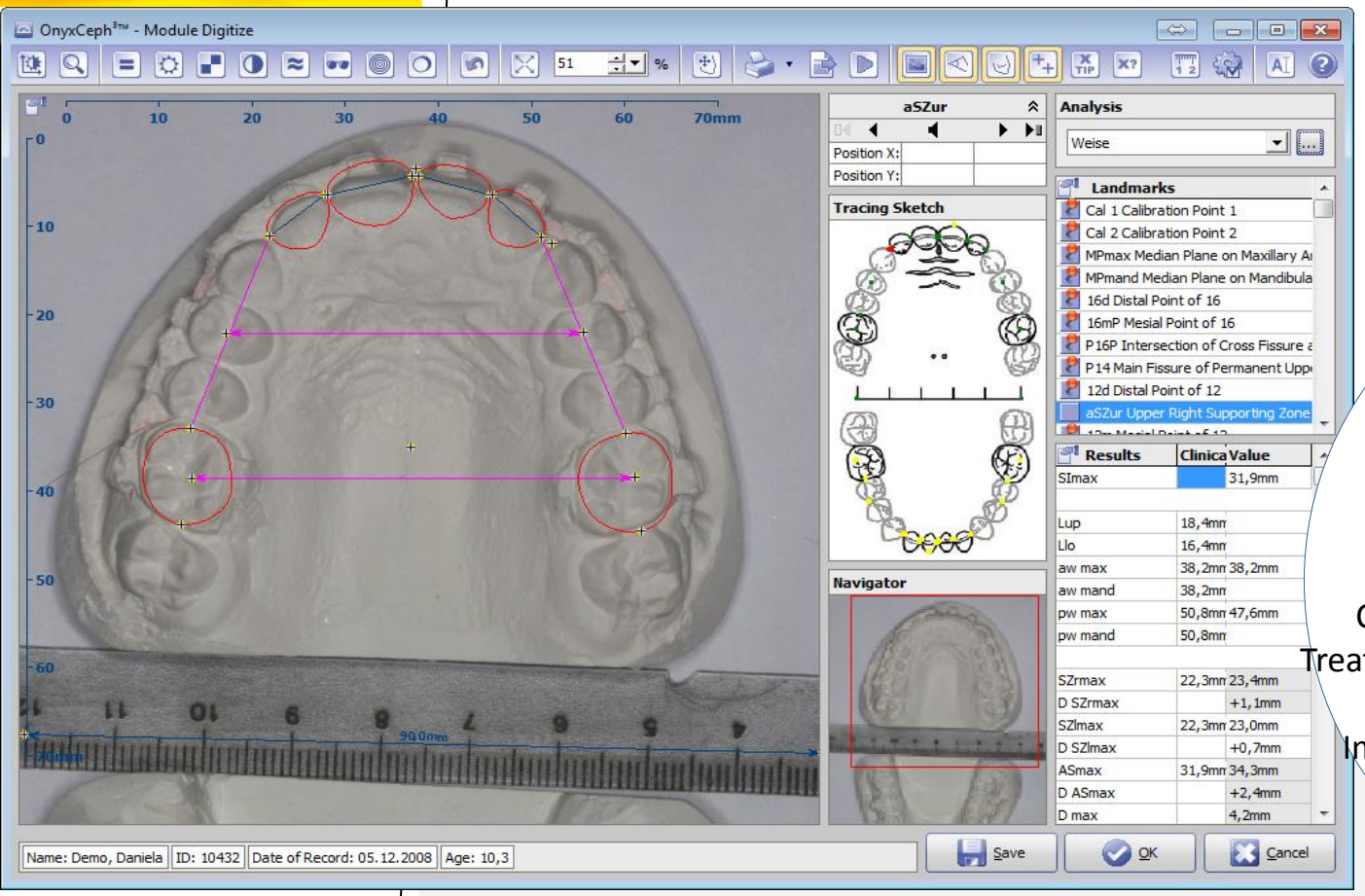
Mirror
CO|CR Correction
Treatment Simulation
Ricketts V.T.O.
Image Comparison

MODULES

OnyxCeph³™

2D Imaging



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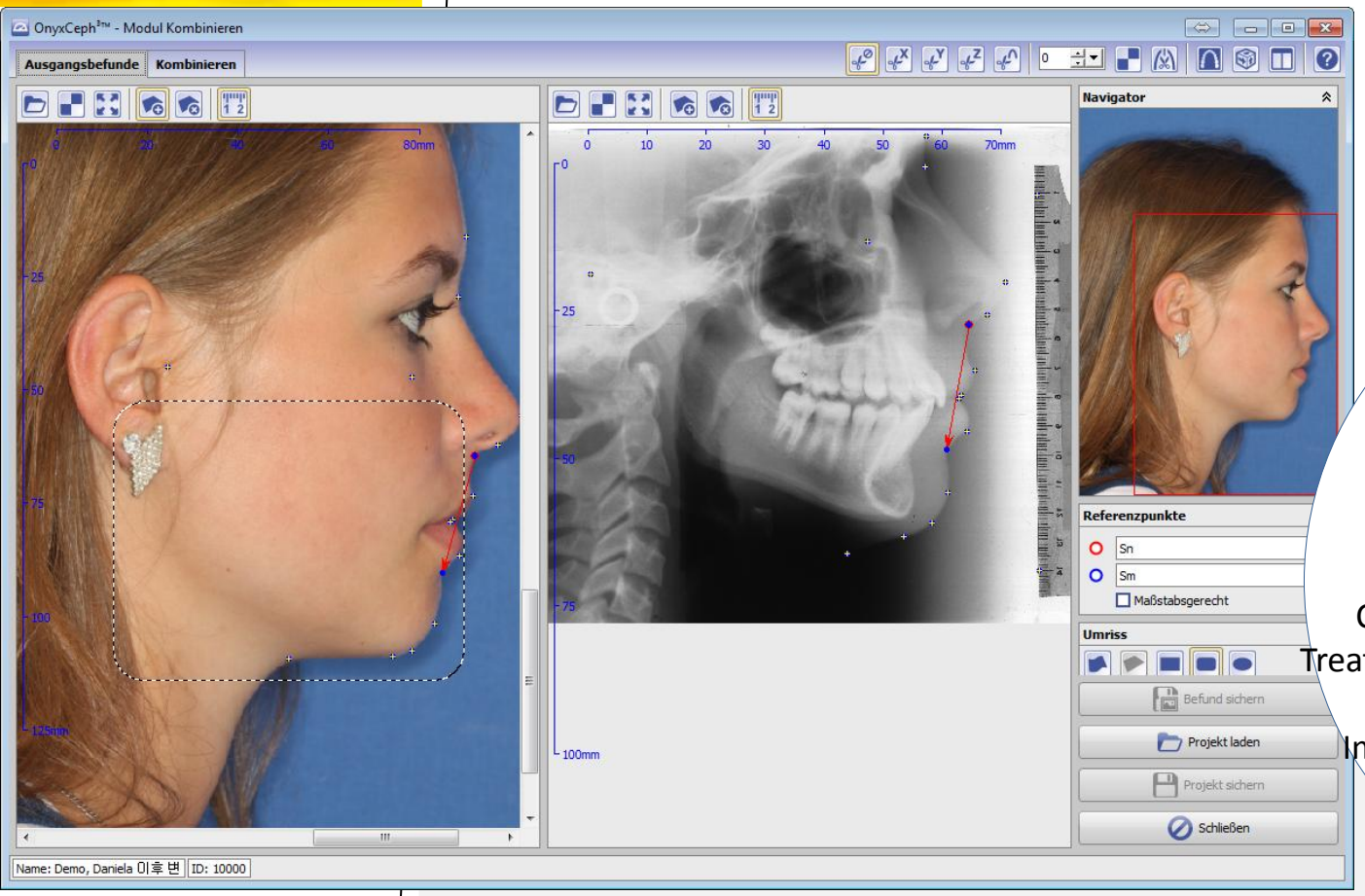
Ricketts V.T.O.
Image Comparison

MODULES

OnyxCeph³™

2D Imaging



MODULES

- Add Image
- Adjust Image
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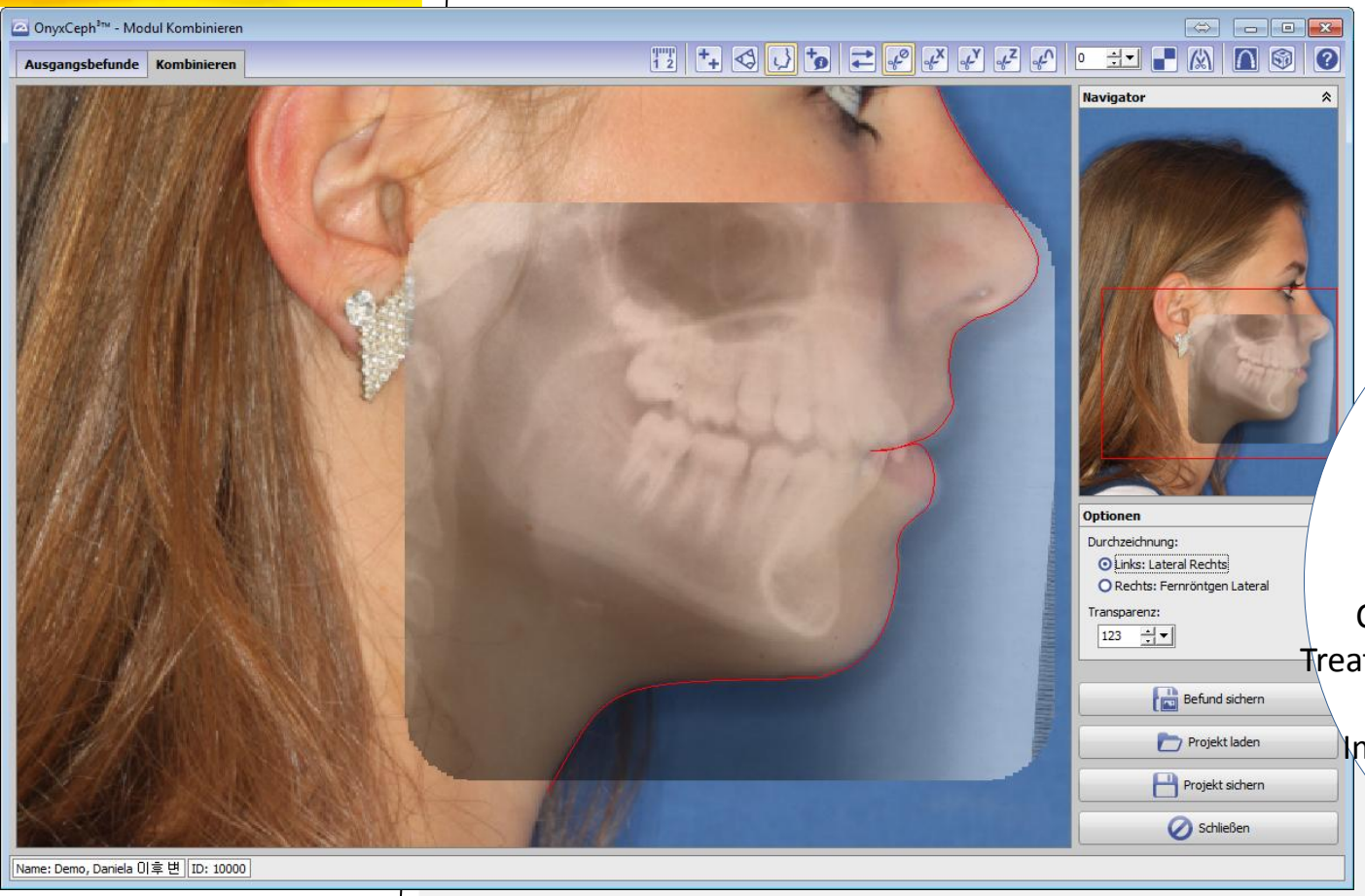
- **Combine**
- Mirror
- CO|CR Correction
- Treatment Simulation
- Ricketts V.T.O.
- Image Comparison

OnyxCeph³™

2D Imaging



MODULES

- Add Image
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- **Combine**
- Mirror
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OnyxCeph³™

2D Imaging

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- Adjust Image
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- **Mirror**
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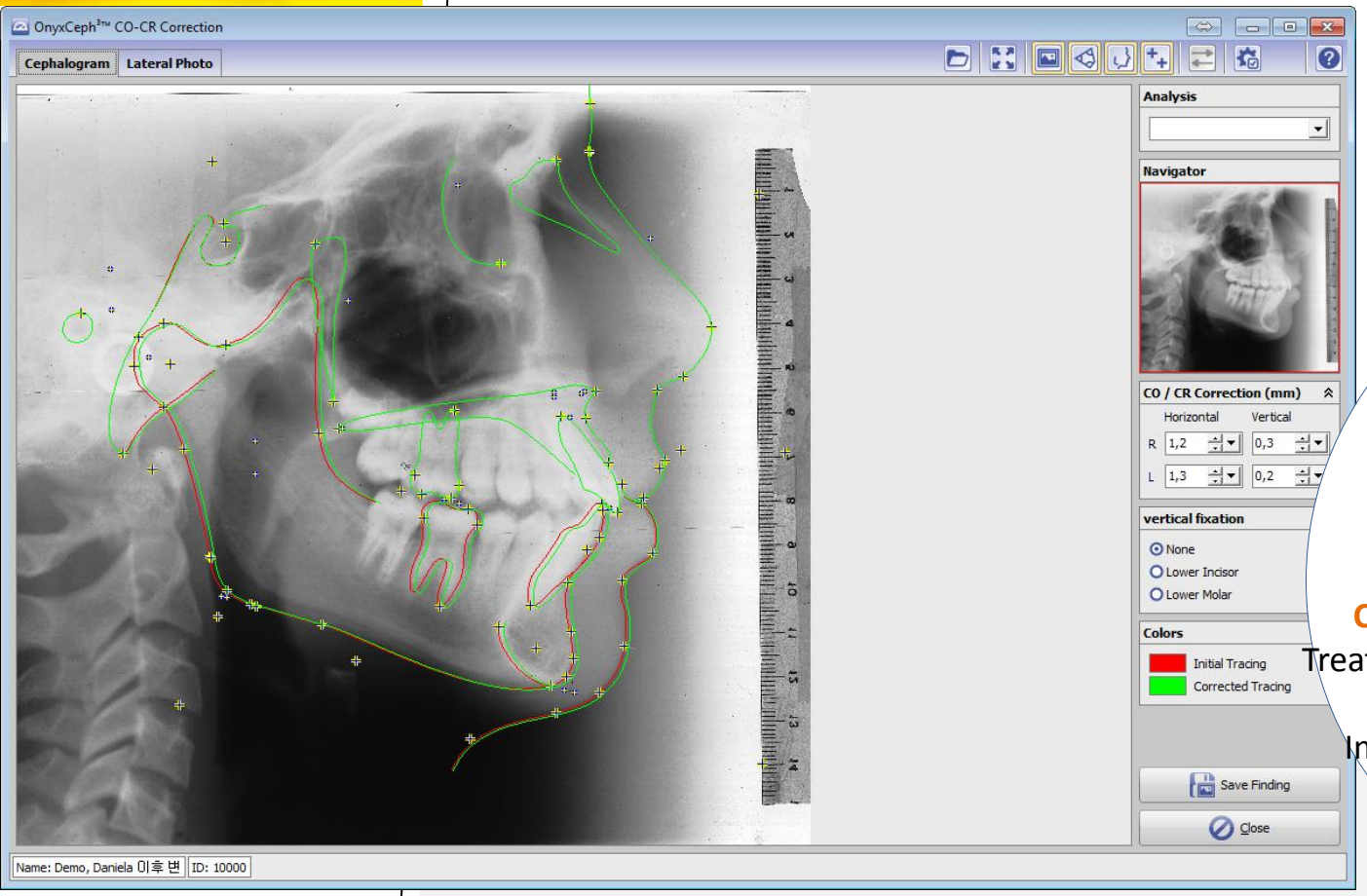
OnyxCeph³™

2D Imaging



MODULES

- Add Image
- Adjust Image
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- Digitize
- Combine
- Mirror
- **CO|CR Correction**
- Treatment Simulation
- Ricketts V.T.O.
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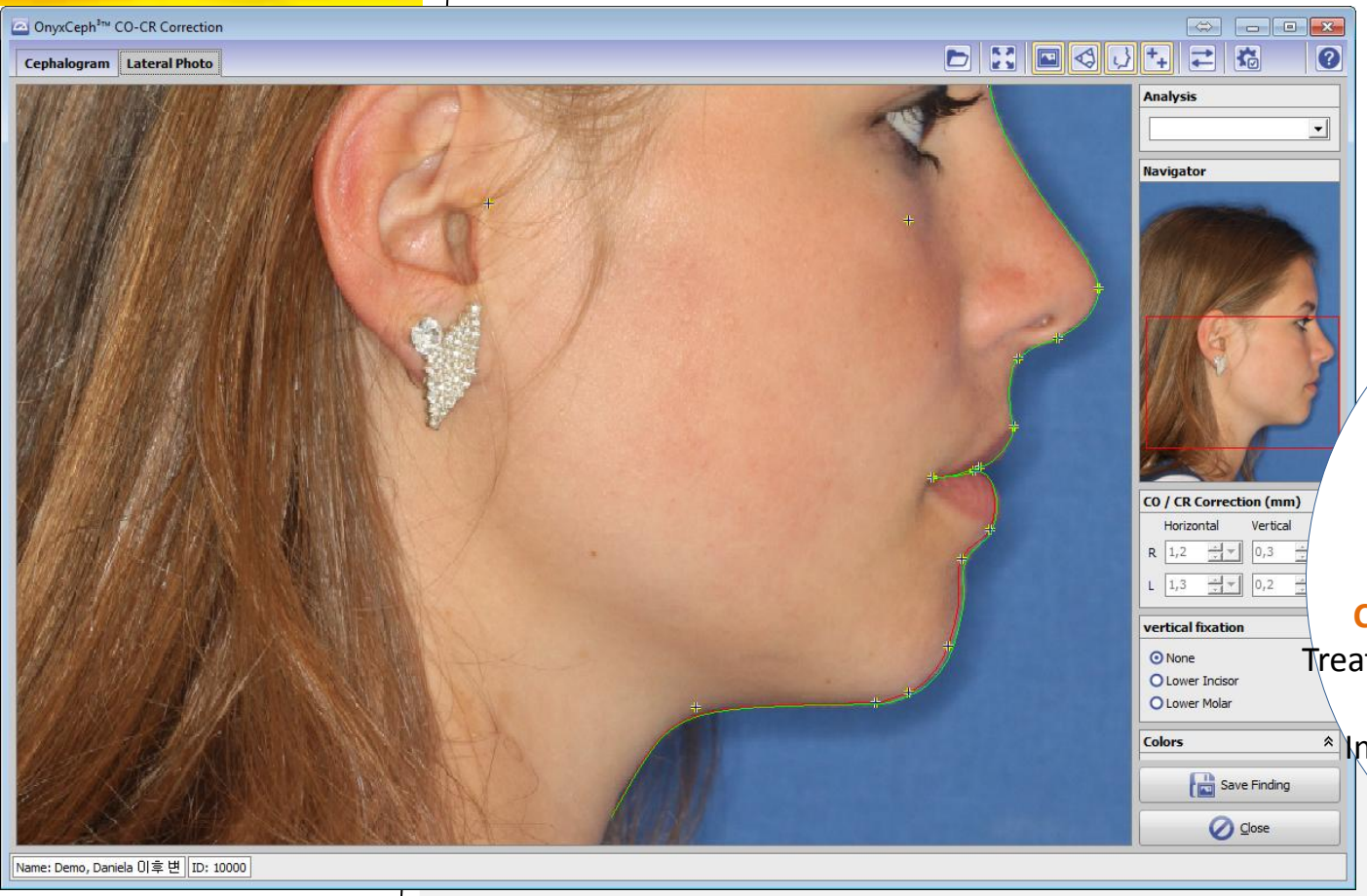
OnyxCeph³™

2D Imaging



MODULES

- Add Image
- Adjust Image
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- Digitize
- Combine
- Mirror
- **CO|CR Correction**
- Treatment Simulation
- Ricketts V.T.O.
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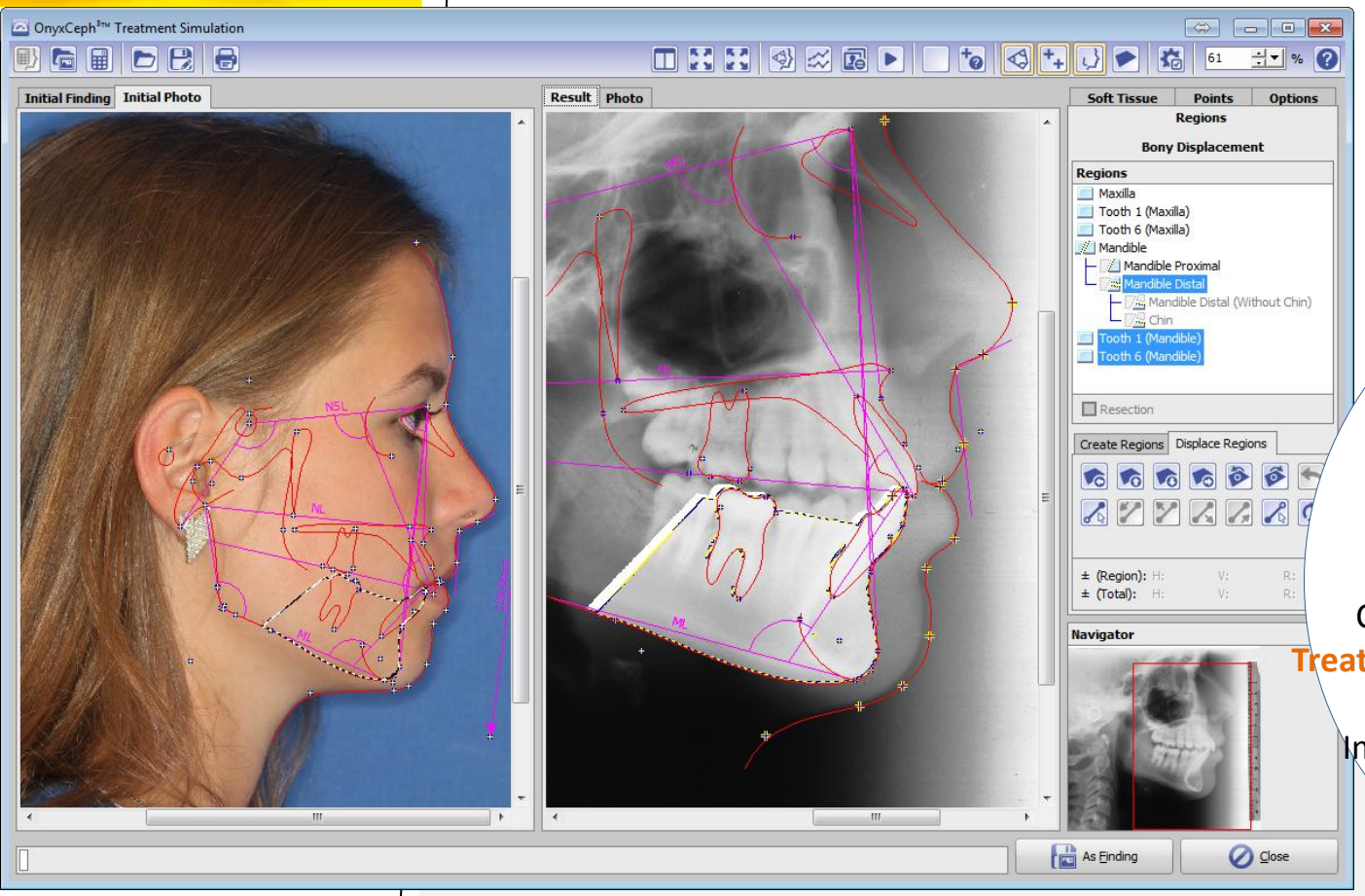
OnyxCeph³™

2D Imaging



Add Image
Adjust Image
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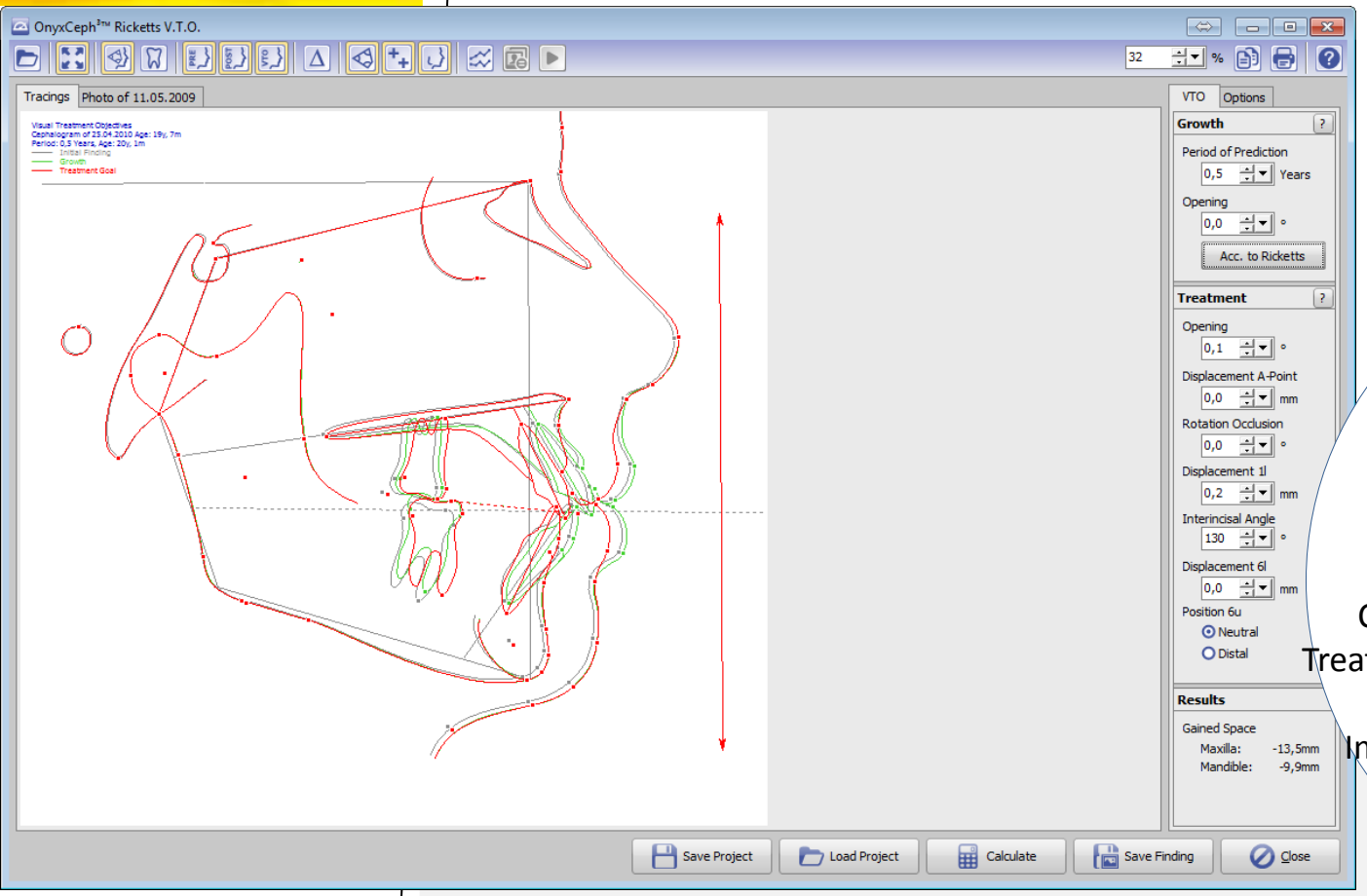
Treatment Simulation
Ricketts V.T.O.
Image Comparison

MODULES

OnyxCeph³™

Overview OnyxCeph³™

2D Imaging



MODULES

- Add Image
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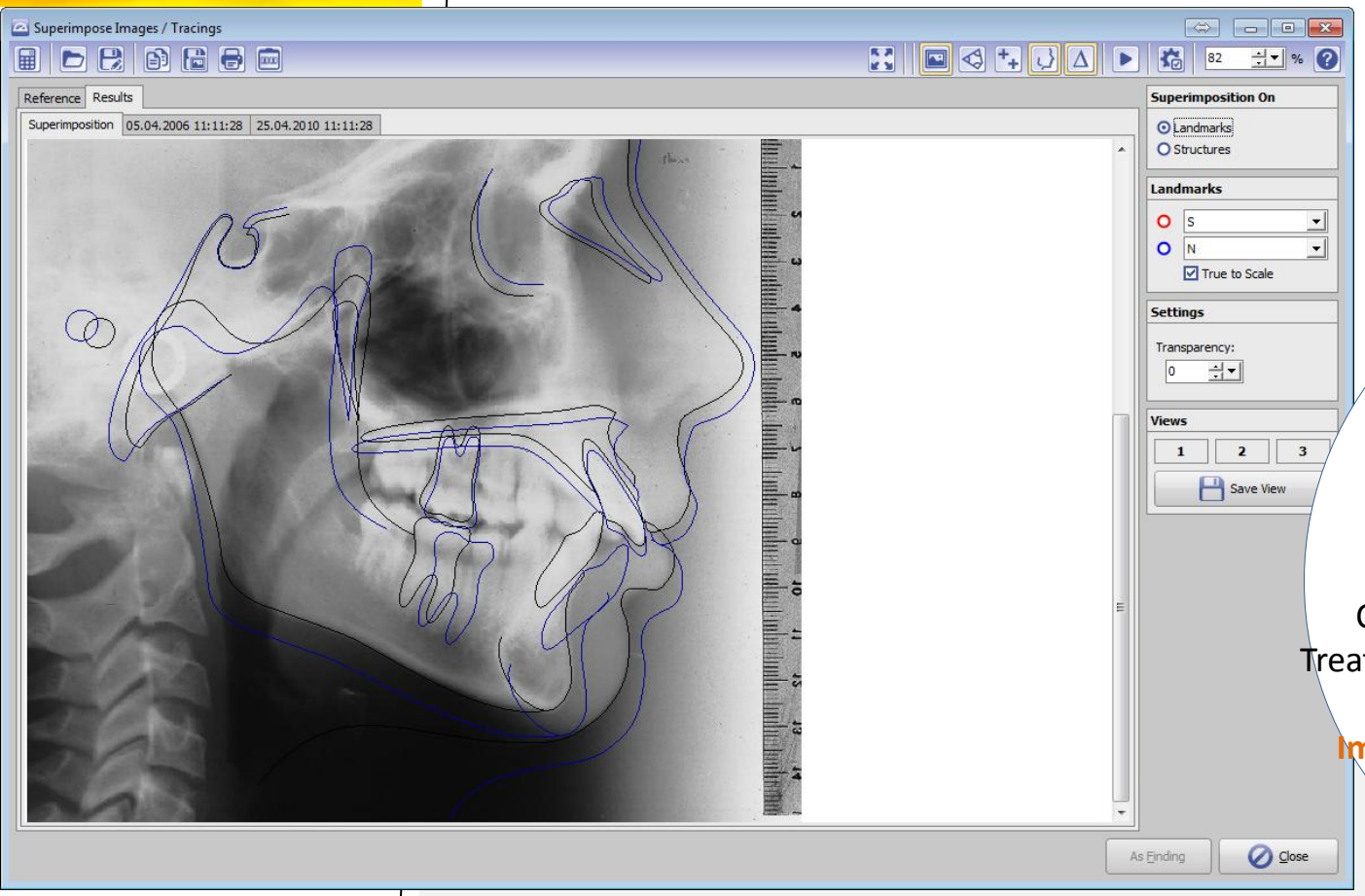
- Combine
- Mirror
- CO|CR Correction
- Treatment Simulation
- **Ricketts V.T.O.**
- Image Comparison

OnyxCeph³™

2D Imaging



MODULES

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- Adjust Image
- Edit
- Digitize
- Combine
- Mirror
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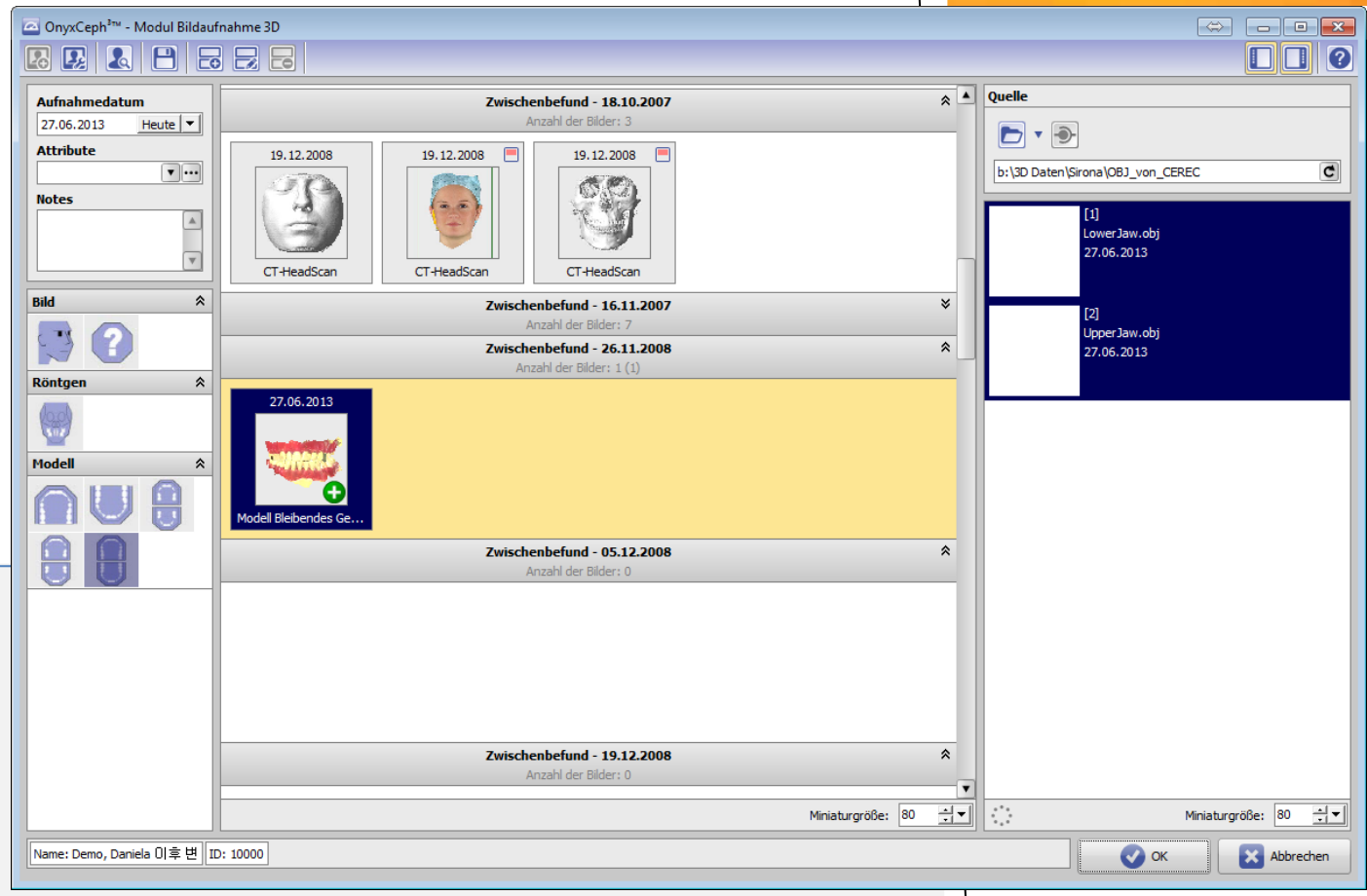
- Treatment Simulation
- Ricketts V.T.O.
- **Image Comparison**

OnyxCeph³™

3D Imaging

MODULES

- **Add Image**
- Adjust Image
- Digitize
- Combine
- Mirror
- Treatment Simulation 3D
- Image Comparison
- Cast Adjust
- Segmentation
- FA_Bonding
- V.T.O.3D
- Wire Bonding
- Kylix 3D
- Bonding Trays 3D
- Splint 3D
- Bracket Adapt
- Aligner 3D
- Retainer 3D
- Waefer Creation 3D



OnyxCeph³™

3D Imaging

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- Retainer 3D
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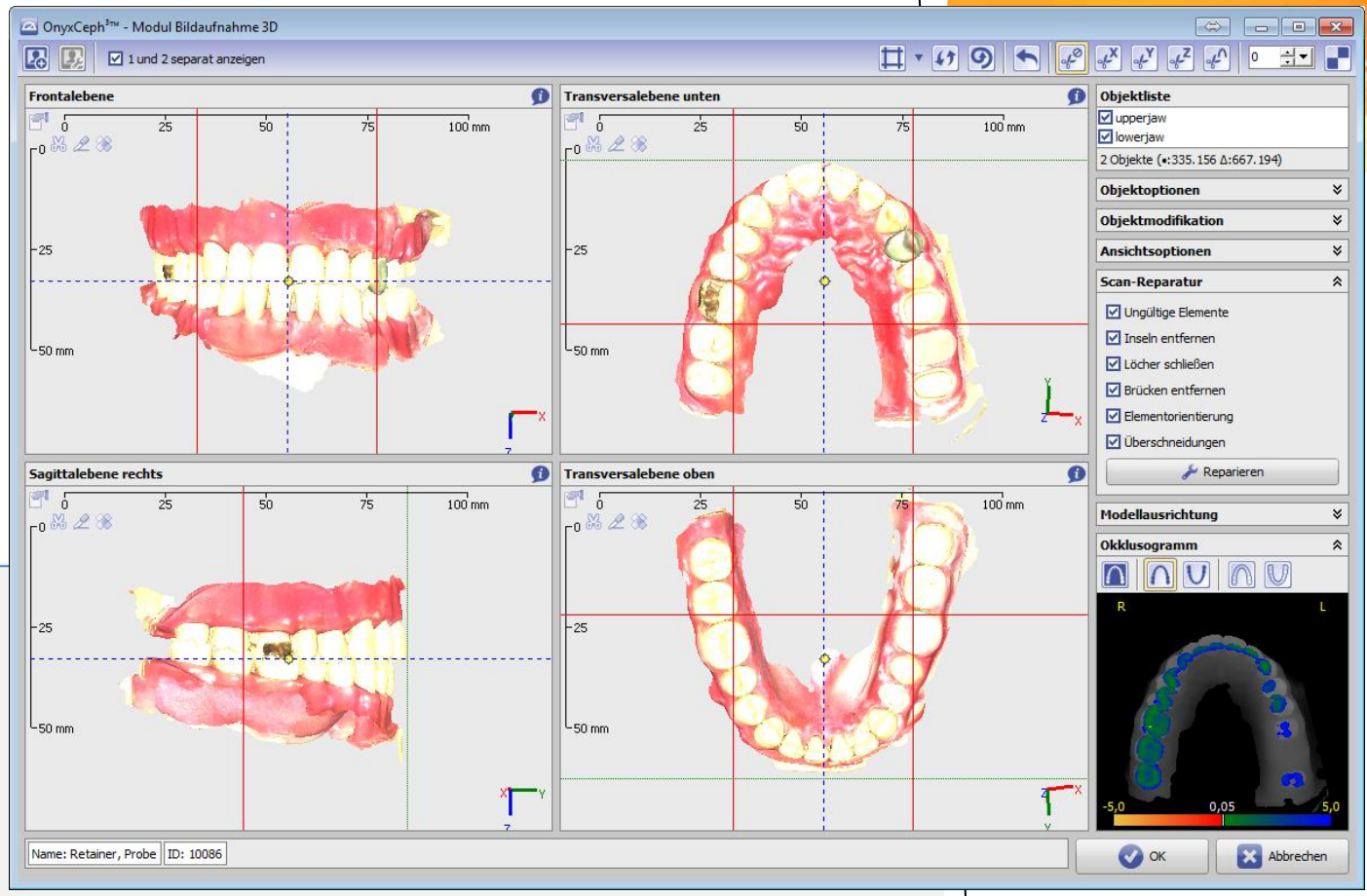

OnyxCeph³™

3D Imaging

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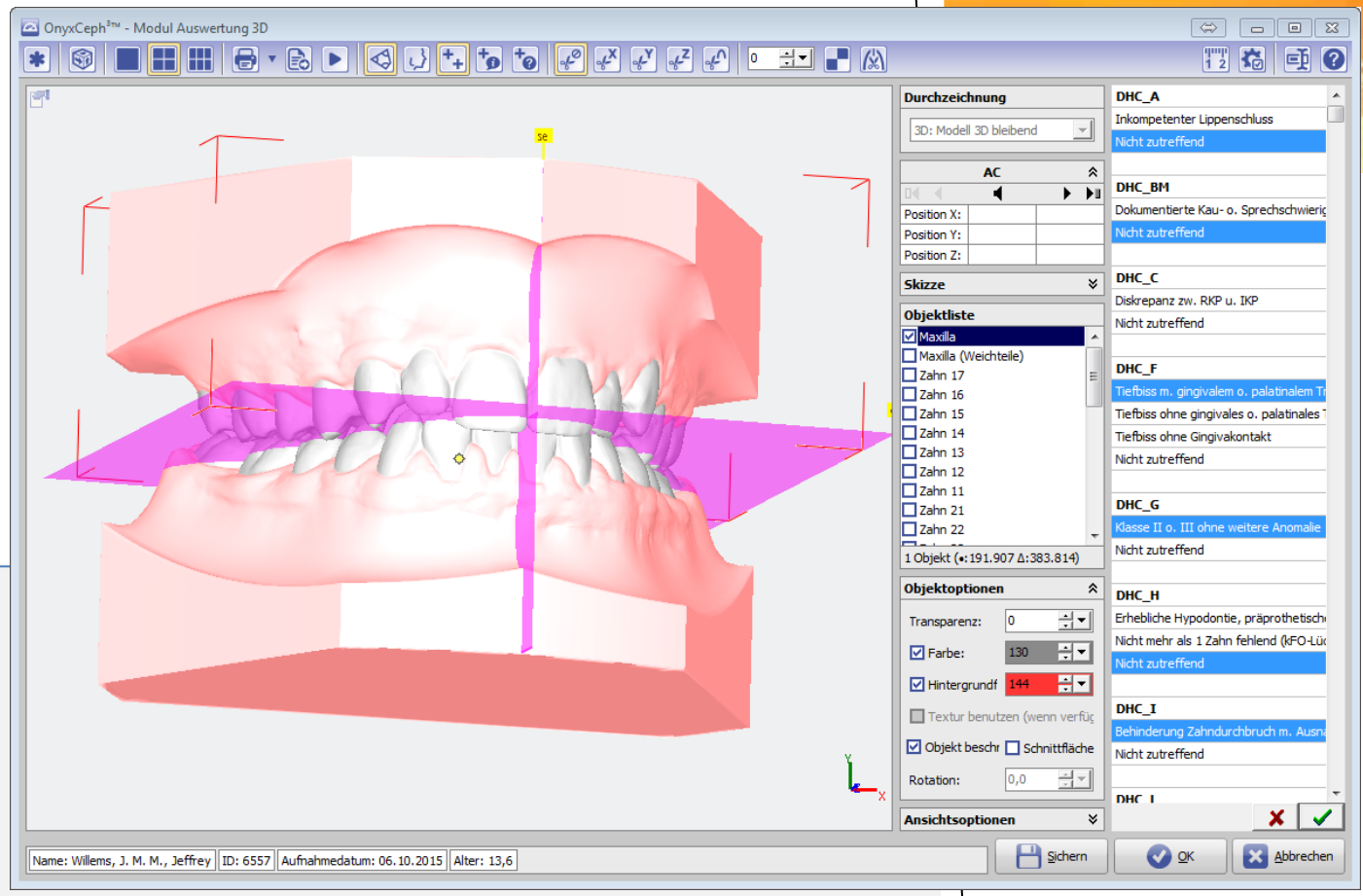

OnyxCeph³™

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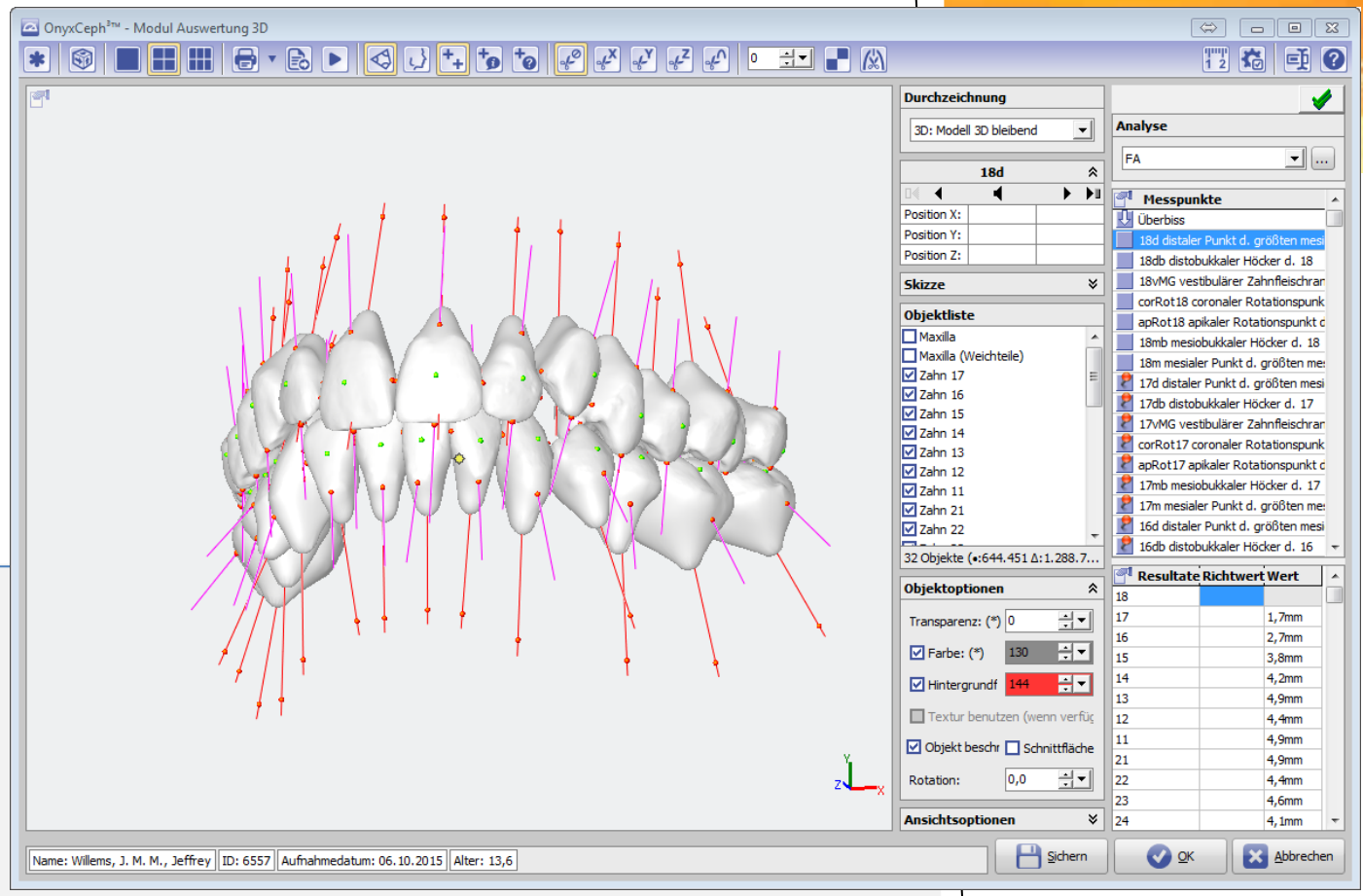
- Retainer 3D
- Waefer Creation 3D



OnyxCeph³™

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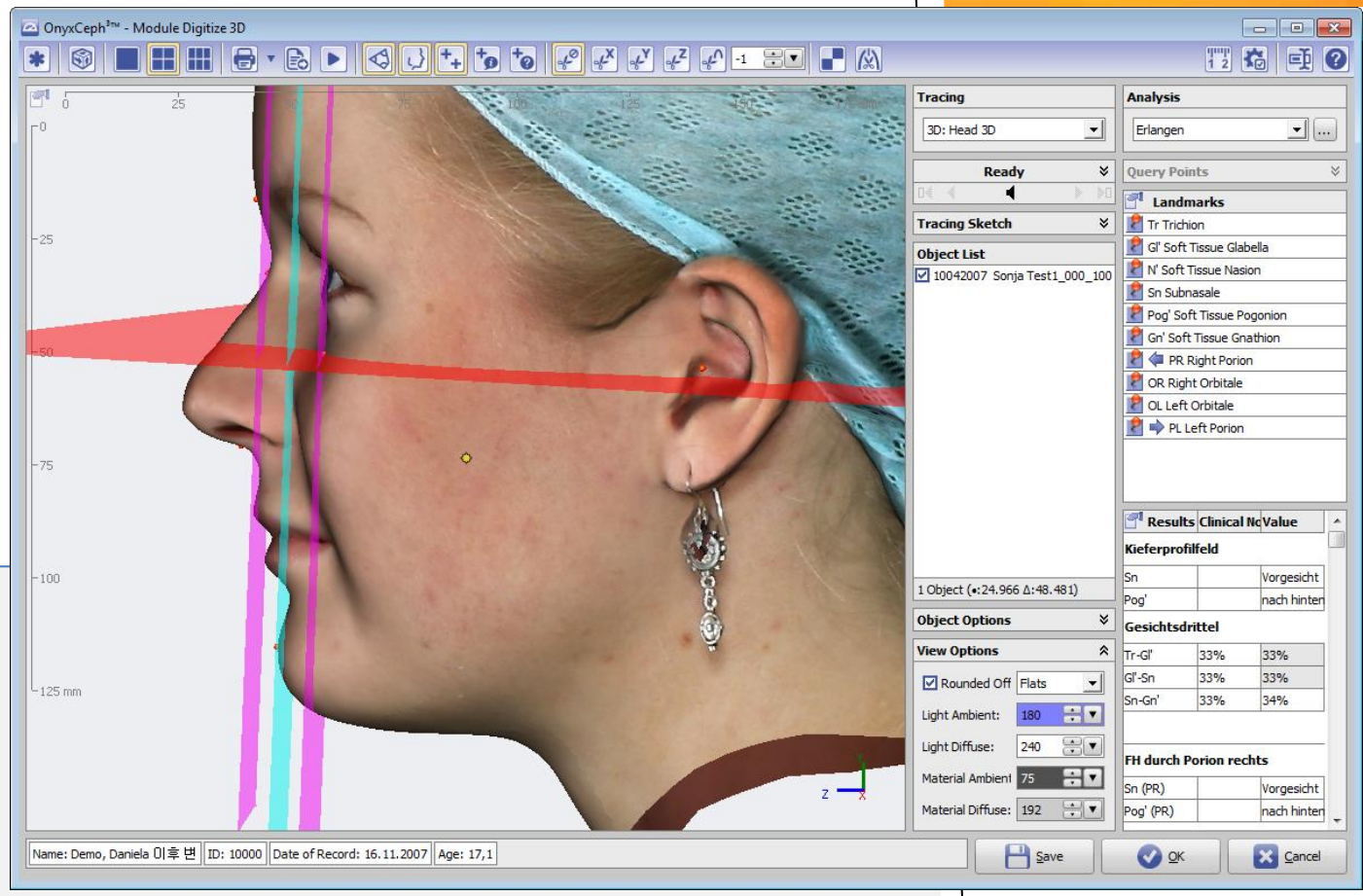

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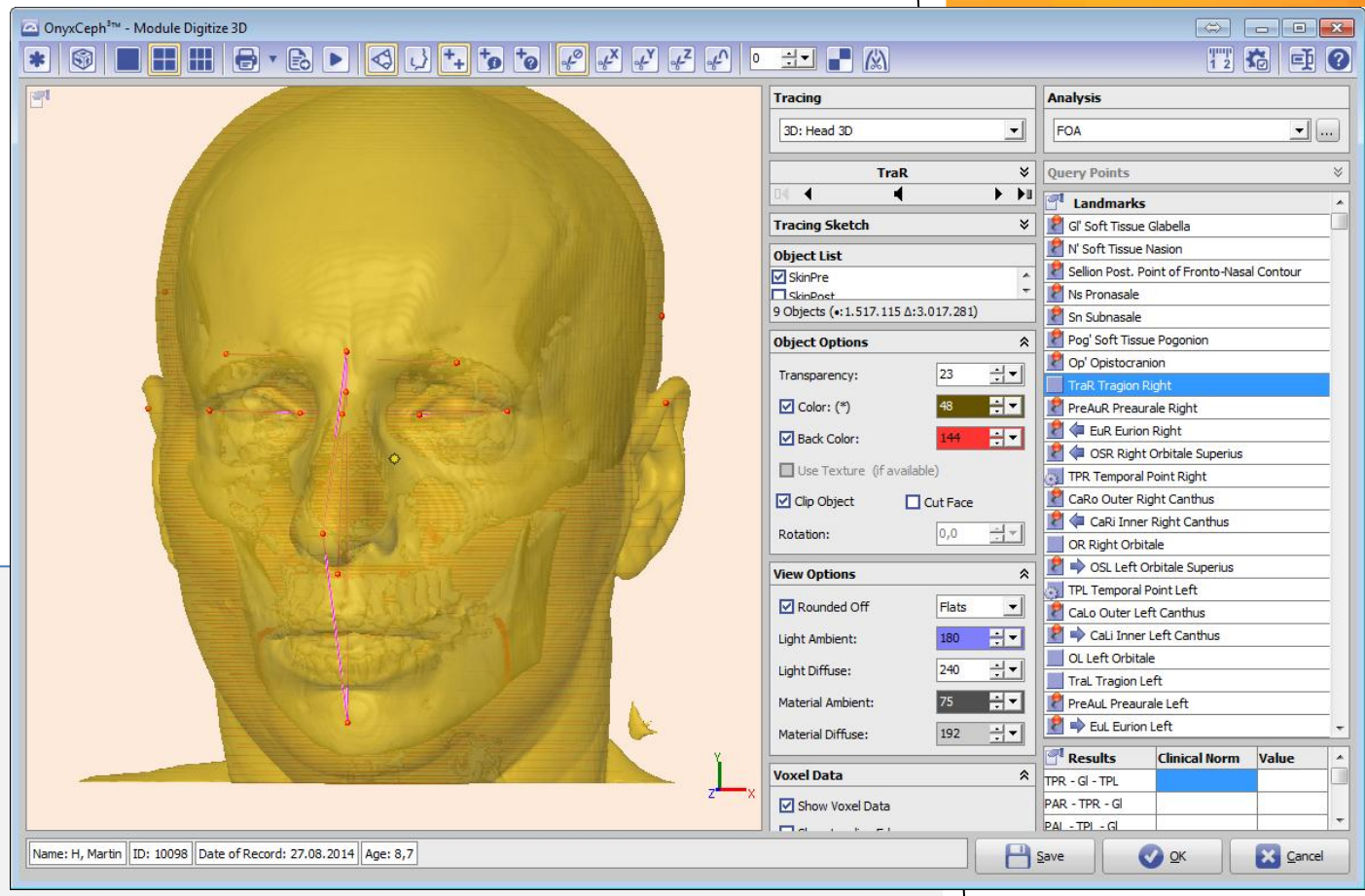

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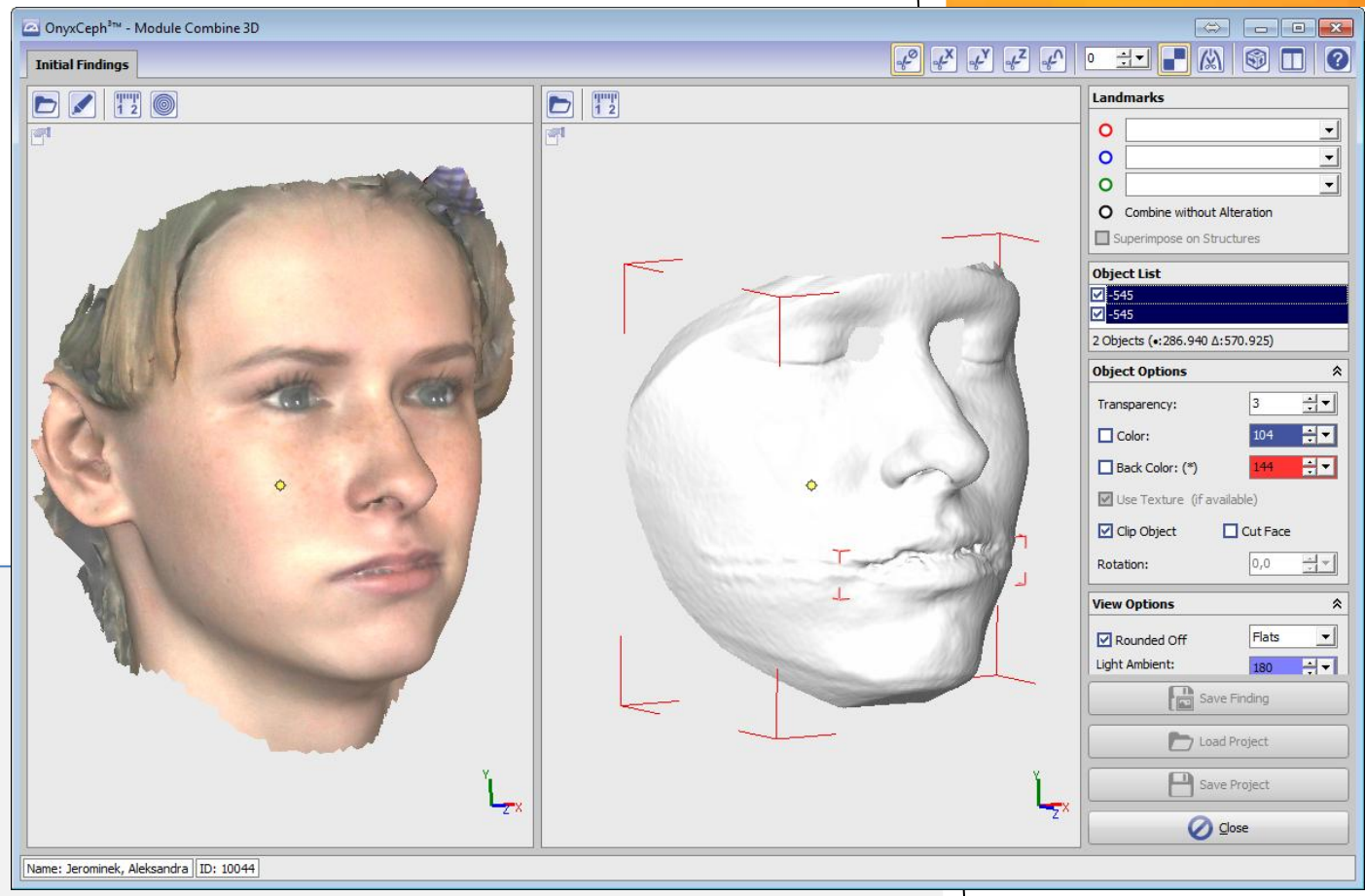

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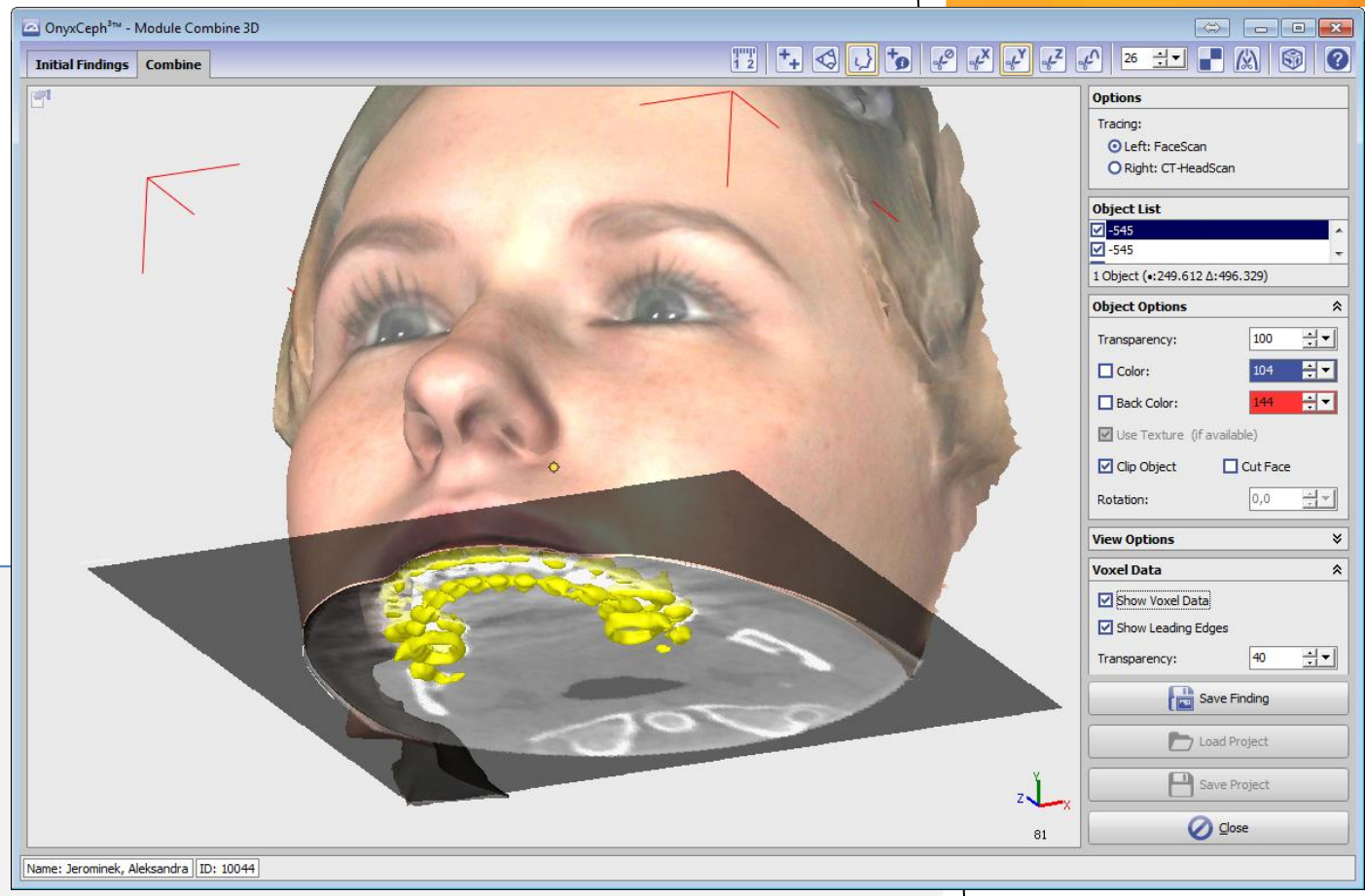

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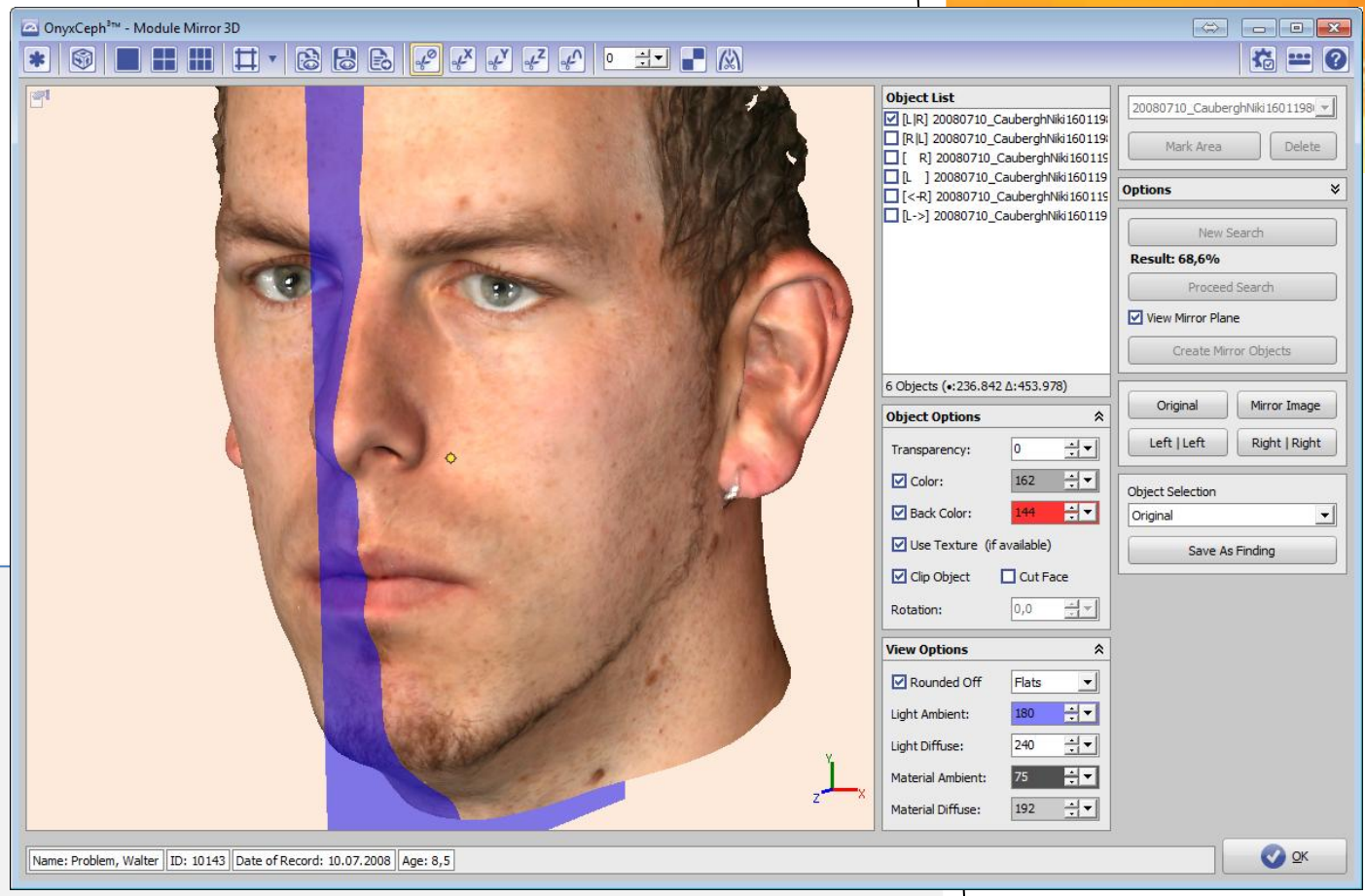

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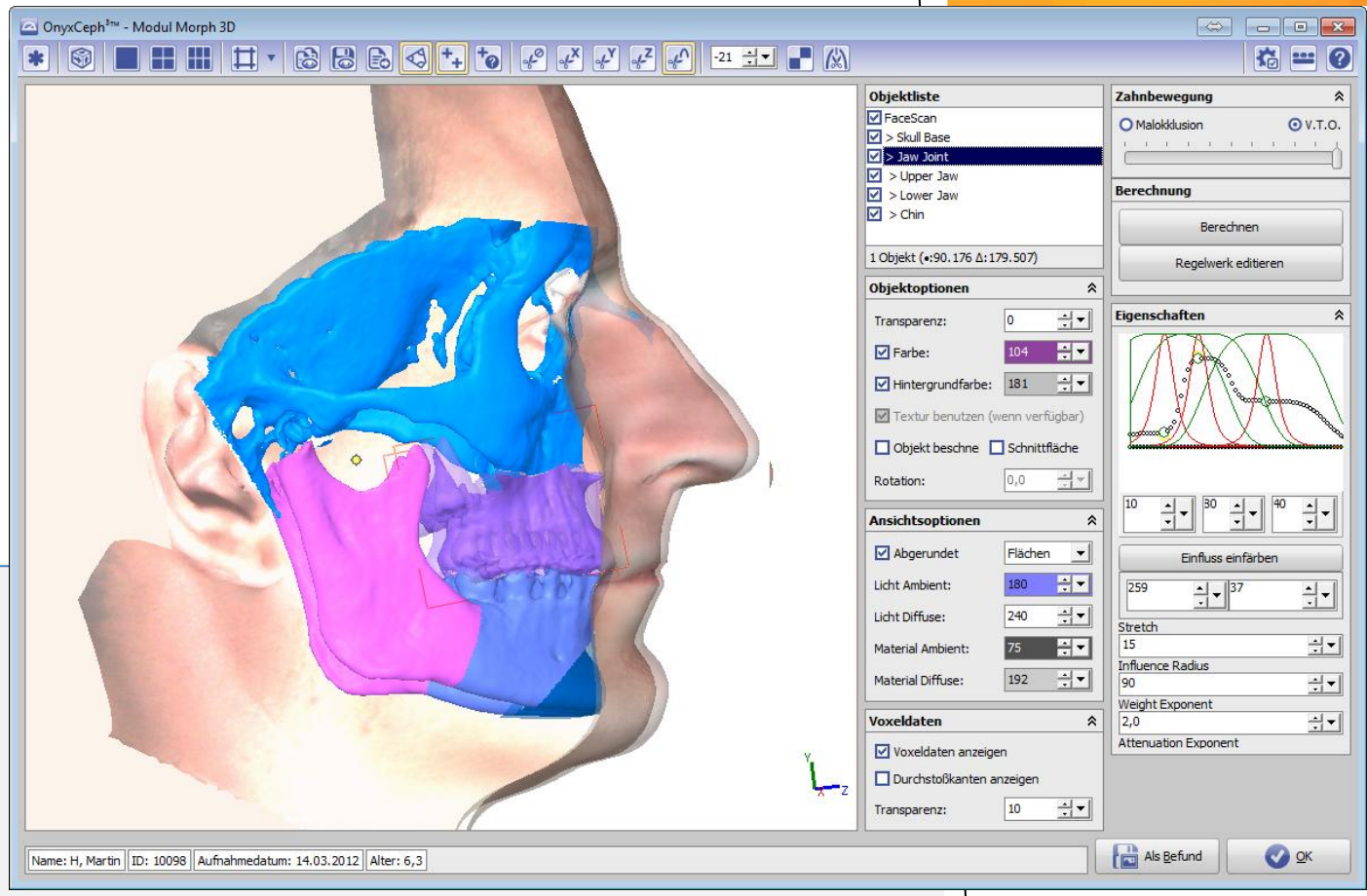

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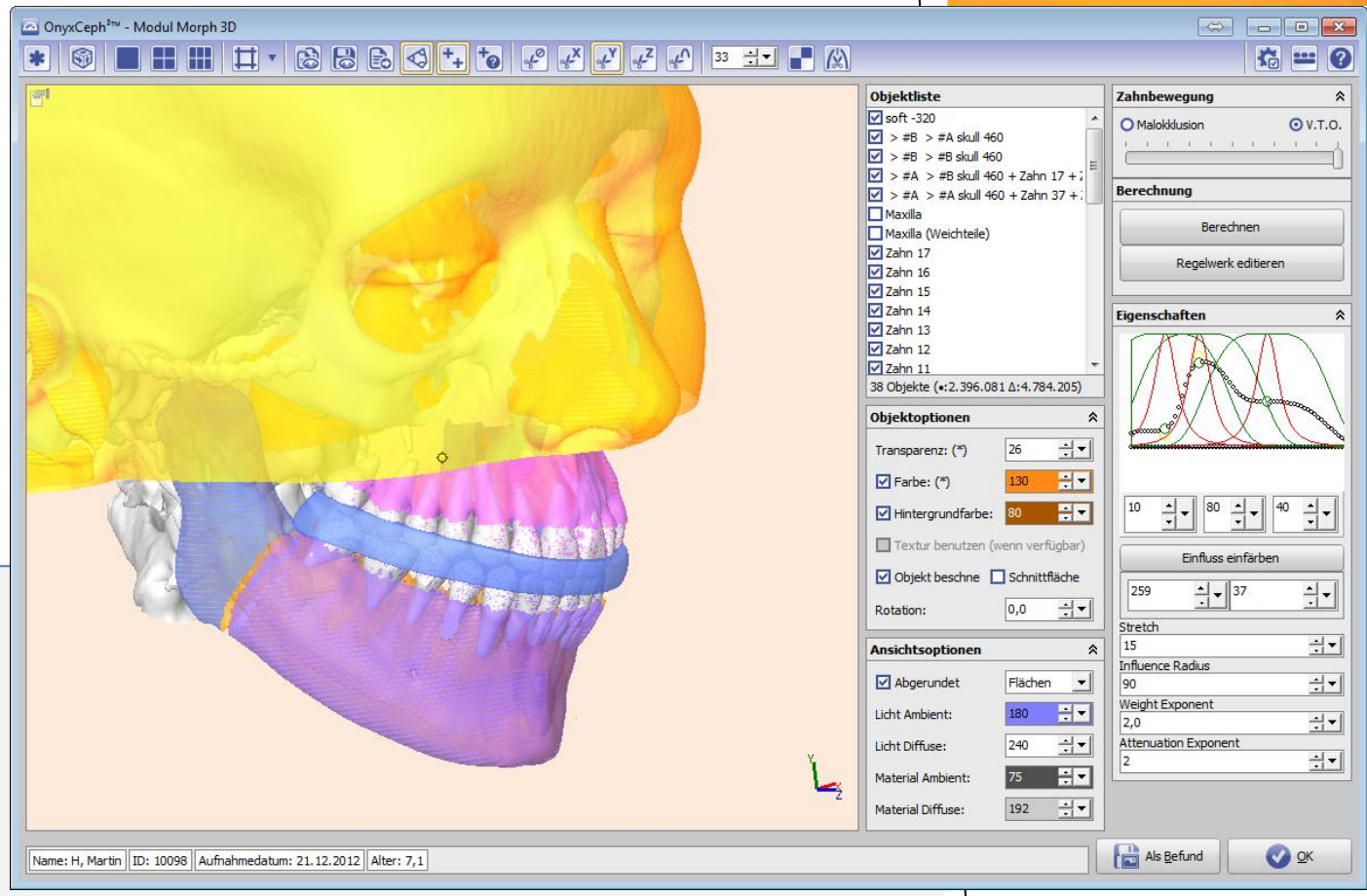

OnyxCeph³™

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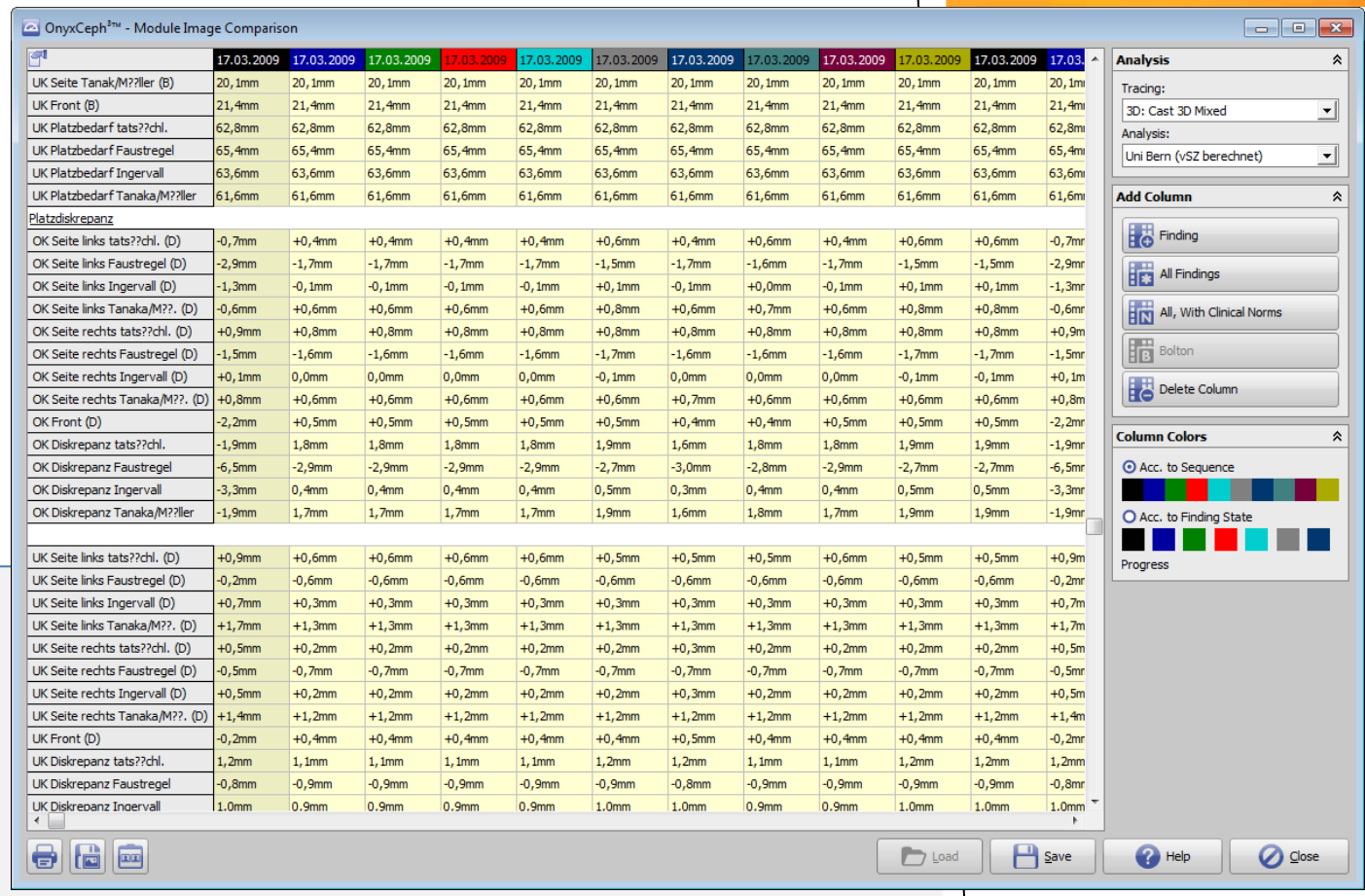
- Retainer 3D
- Waefer Creation 3D



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UK Seite Tanak/M??ller (B)	20,1mm	20,1mm	20,1mm	20,1mm	20,1mm	20,1mm	20,1mm	20,1mm	20,1mm	20,1mm	20,1mm	20,1m
UK Front (B)	21,4mm	21,4mm	21,4mm	21,4mm	21,4mm	21,4mm	21,4mm	21,4mm	21,4mm	21,4mm	21,4mm	21,4m
UK Platzbedarf tats??chl.	62,8mm	62,8mm	62,8mm	62,8mm	62,8mm	62,8mm	62,8mm	62,8mm	62,8mm	62,8mm	62,8mm	62,8m
UK Platzbedarf Faustregel	65,4mm	65,4mm	65,4mm	65,4mm	65,4mm	65,4mm	65,4mm	65,4mm	65,4mm	65,4mm	65,4mm	65,4m
UK Platzbedarf Ingervall	63,6mm	63,6mm	63,6mm	63,6mm	63,6mm	63,6mm	63,6mm	63,6mm	63,6mm	63,6mm	63,6mm	63,6m
UK Platzbedarf Tanaka/M??ller	61,6mm	61,6mm	61,6mm	61,6mm	61,6mm	61,6mm	61,6mm	61,6mm	61,6mm	61,6mm	61,6mm	61,6m
Platzdiskrepanz												
OK Seite links tats??chl. (D)	-0,7mm	+0,4mm	+0,4mm	+0,4mm	+0,4mm	+0,6mm	+0,4mm	+0,6mm	+0,4mm	+0,6mm	+0,6mm	-0,7mr
OK Seite links Faustregel (D)	-2,9mm	-1,7mm	-1,7mm	-1,7mm	-1,7mm	-1,5mm	-1,7mm	-1,6mm	-1,7mm	-1,5mm	-1,5mm	-2,9mr
OK Seite links Ingervall (D)	-1,3mm	-0,1mm	-0,1mm	-0,1mm	-0,1mm	+0,1mm	-0,1mm	+0,0mm	-0,1mm	+0,1mm	+0,1mm	-1,3mr
OK Seite links Tanaka/M??. (D)	-0,6mm	+0,6mm	+0,6mm	+0,6mm	+0,6mm	+0,8mm	+0,6mm	+0,7mm	+0,6mm	+0,8mm	+0,8mm	-0,6mr
OK Seite rechts tats??chl. (D)	+0,9mm	+0,8mm	+0,8mm	+0,8mm	+0,8mm	+0,8mm	+0,8mm	+0,8mm	+0,8mm	+0,8mm	+0,8mm	+0,9m
OK Seite rechts Faustregel (D)	-1,5mm	-1,6mm	-1,6mm	-1,6mm	-1,6mm	-1,7mm	-1,6mm	-1,6mm	-1,6mm	-1,7mm	-1,7mm	-1,5mr
OK Seite rechts Ingervall (D)	+0,1mm	0,0mm	0,0mm	0,0mm	0,0mm	-0,1mm	0,0mm	0,0mm	0,0mm	-0,1mm	-0,1mm	+0,1m
OK Seite rechts Tanaka/M??. (D)	+0,8mm	+0,6mm	+0,6mm	+0,6mm	+0,6mm	+0,6mm	+0,7mm	+0,6mm	+0,6mm	+0,6mm	+0,6mm	+0,8m
OK Front (D)	-2,2mm	+0,5mm	+0,5mm	+0,5mm	+0,5mm	+0,5mm	+0,4mm	+0,4mm	+0,5mm	+0,5mm	+0,5mm	-2,2mr
OK Diskrepanz tats??chl.	-1,9mm	1,8mm	1,8mm	1,8mm	1,8mm	1,9mm	1,6mm	1,8mm	1,8mm	1,9mm	1,9mm	-1,9mr
OK Diskrepanz Faustregel	-6,5mm	-2,9mm	-2,9mm	-2,9mm	-2,9mm	-2,7mm	-3,0mm	-2,8mm	-2,9mm	-2,7mm	-2,7mm	-6,5mr
OK Diskrepanz Ingervall	-3,3mm	0,4mm	0,4mm	0,4mm	0,4mm	0,5mm	0,3mm	0,4mm	0,4mm	0,5mm	0,5mm	-3,3mr
OK Diskrepanz Tanaka/M??ller	-1,9mm	1,7mm	1,7mm	1,7mm	1,7mm	1,9mm	1,6mm	1,8mm	1,7mm	1,9mm	1,9mm	-1,9mr
UK Seite links tats??chl. (D)	+0,9mm	+0,6mm	+0,6mm	+0,6mm	+0,6mm	+0,5mm	+0,5mm	+0,5mm	+0,6mm	+0,5mm	+0,5mm	+0,9m
UK Seite links Faustregel (D)	-0,2mm	-0,6mm	-0,6mm	-0,6mm	-0,6mm	-0,6mm	-0,6mm	-0,6mm	-0,6mm	-0,6mm	-0,6mm	-0,2mr
UK Seite links Ingervall (D)	+0,7mm	+0,3mm	+0,3mm	+0,3mm	+0,3mm	+0,3mm	+0,3mm	+0,3mm	+0,3mm	+0,3mm	+0,3mm	+0,7m
UK Seite links Tanaka/M??. (D)	+1,7mm	+1,3mm	+1,3mm	+1,3mm	+1,3mm	+1,3mm	+1,3mm	+1,3mm	+1,3mm	+1,3mm	+1,3mm	+1,7m
UK Seite rechts tats??chl. (D)	+0,5mm	+0,2mm	+0,2mm	+0,2mm	+0,2mm	+0,2mm	+0,3mm	+0,2mm	+0,2mm	+0,2mm	+0,2mm	+0,5m
UK Seite rechts Faustregel (D)	-0,5mm	-0,7mm	-0,7mm	-0,7mm	-0,7mm	-0,7mm	-0,7mm	-0,7mm	-0,7mm	-0,7mm	-0,7mm	-0,5mr
UK Seite rechts Ingervall (D)	+0,5mm	+0,2mm	+0,2mm	+0,2mm	+0,2mm	+0,2mm	+0,3mm	+0,2mm	+0,2mm	+0,2mm	+0,2mm	+0,5m
UK Seite rechts Tanaka/M??. (D)	+1,4mm	+1,2mm	+1,2mm	+1,2mm	+1,2mm	+1,2mm	+1,2mm	+1,2mm	+1,2mm	+1,2mm	+1,2mm	+1,4m
UK Front (D)	-0,2mm	+0,4mm	+0,4mm	+0,4mm	+0,4mm	+0,4mm	+0,5mm	+0,4mm	+0,4mm	+0,4mm	+0,4mm	-0,2mr
UK Diskrepanz tats??chl.	1,2mm	1,1mm	1,1mm	1,1mm	1,1mm	1,2mm	1,2mm	1,1mm	1,1mm	1,2mm	1,2mm	1,2mm
UK Diskrepanz Faustregel	-0,8mm	-0,9mm	-0,9mm	-0,9mm	-0,9mm	-0,9mm	-0,8mm	-0,9mm	-0,9mm	-0,9mm	-0,9mm	-0,8mr
UK Diskrepanz Ingervall	1.0mm	0.9mm	0.9mm	0.9mm	0.9mm	1.0mm	1.0mm	0.9mm	0.9mm	1.0mm	1.0mm	1.0mm

OnyxCeph³™

3D Imaging

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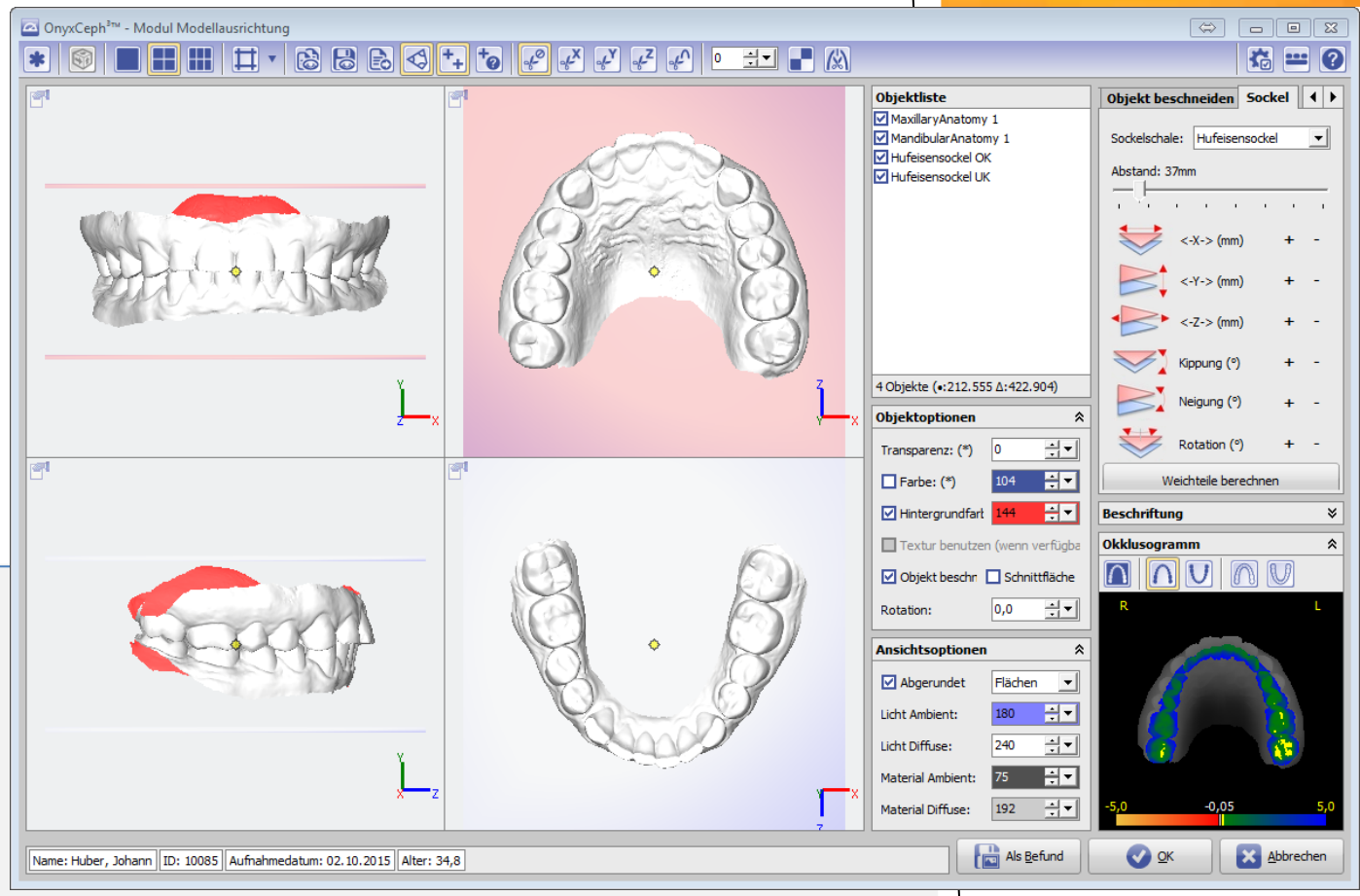
- Retainer 3D
- Waefer Creation 3D



OnyxCeph³™

3D Imaging

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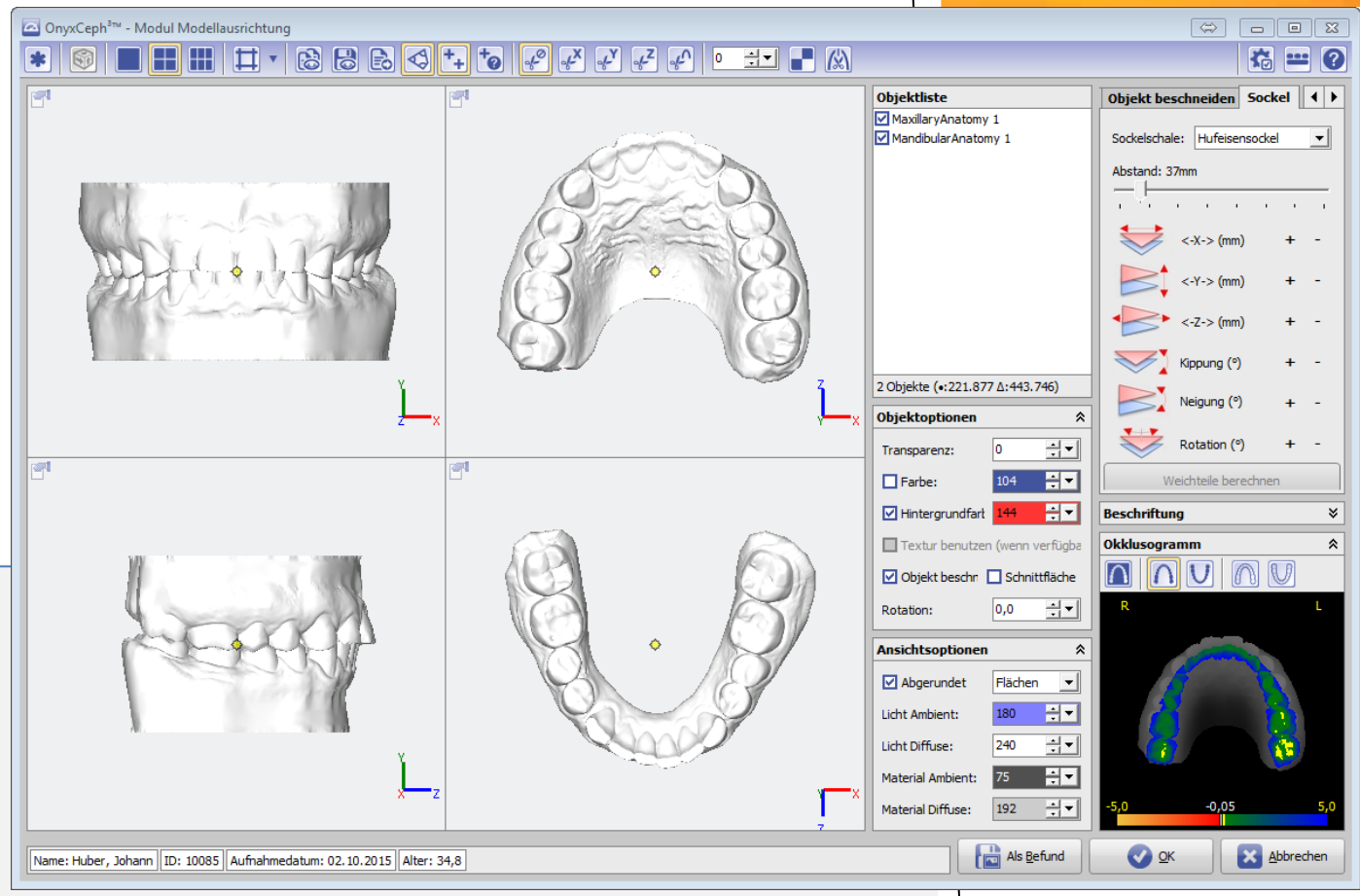

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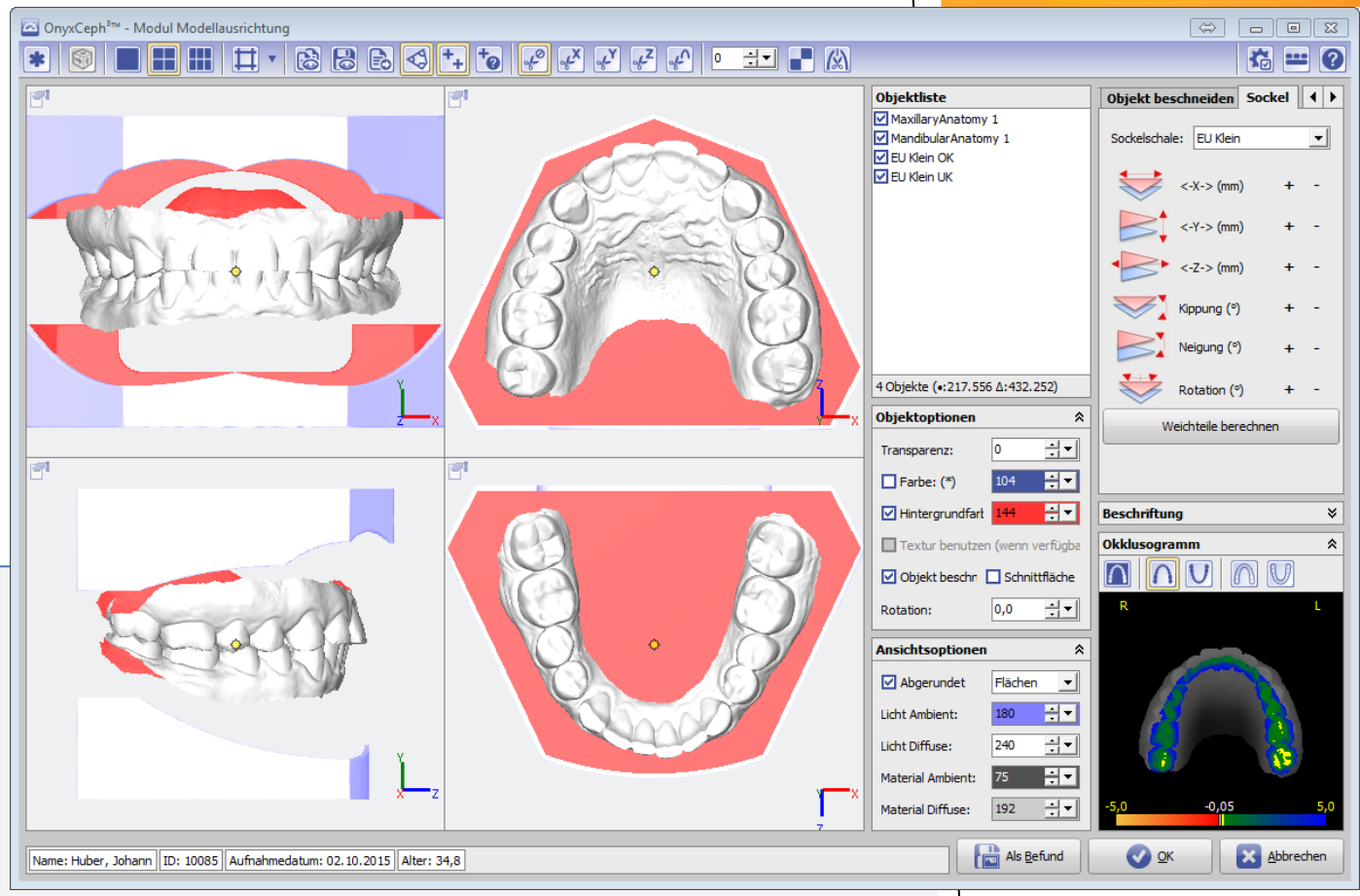

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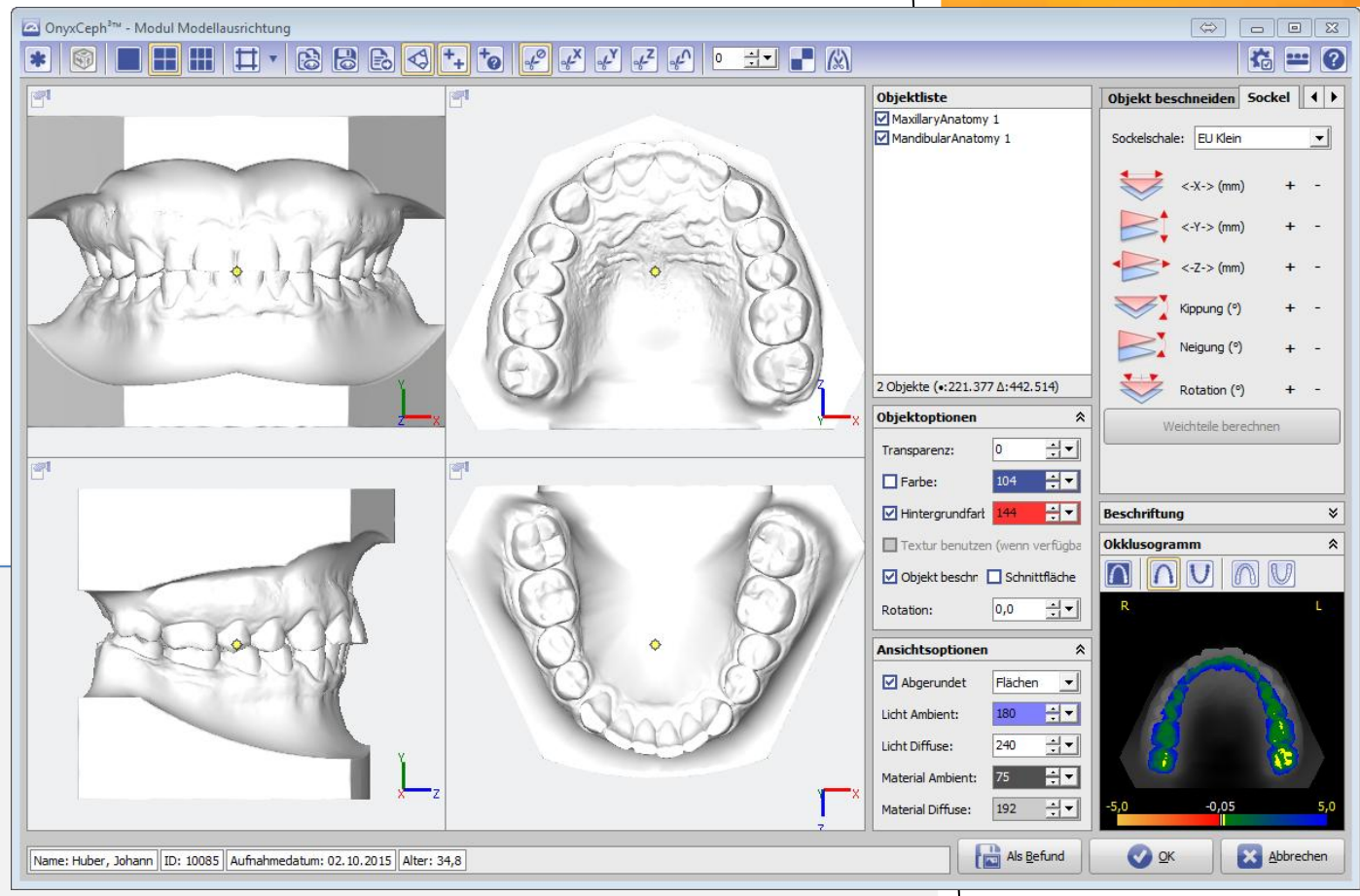

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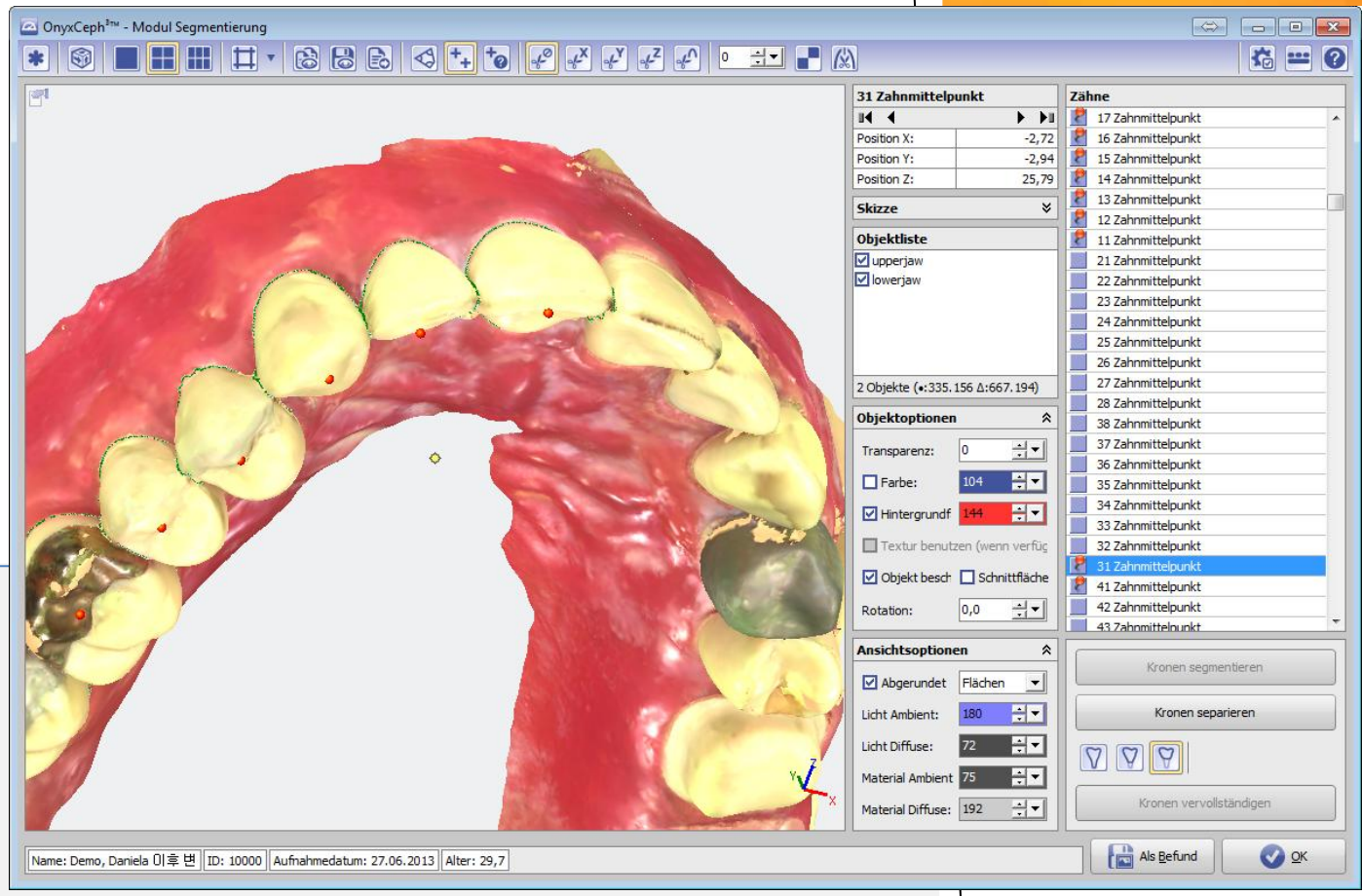

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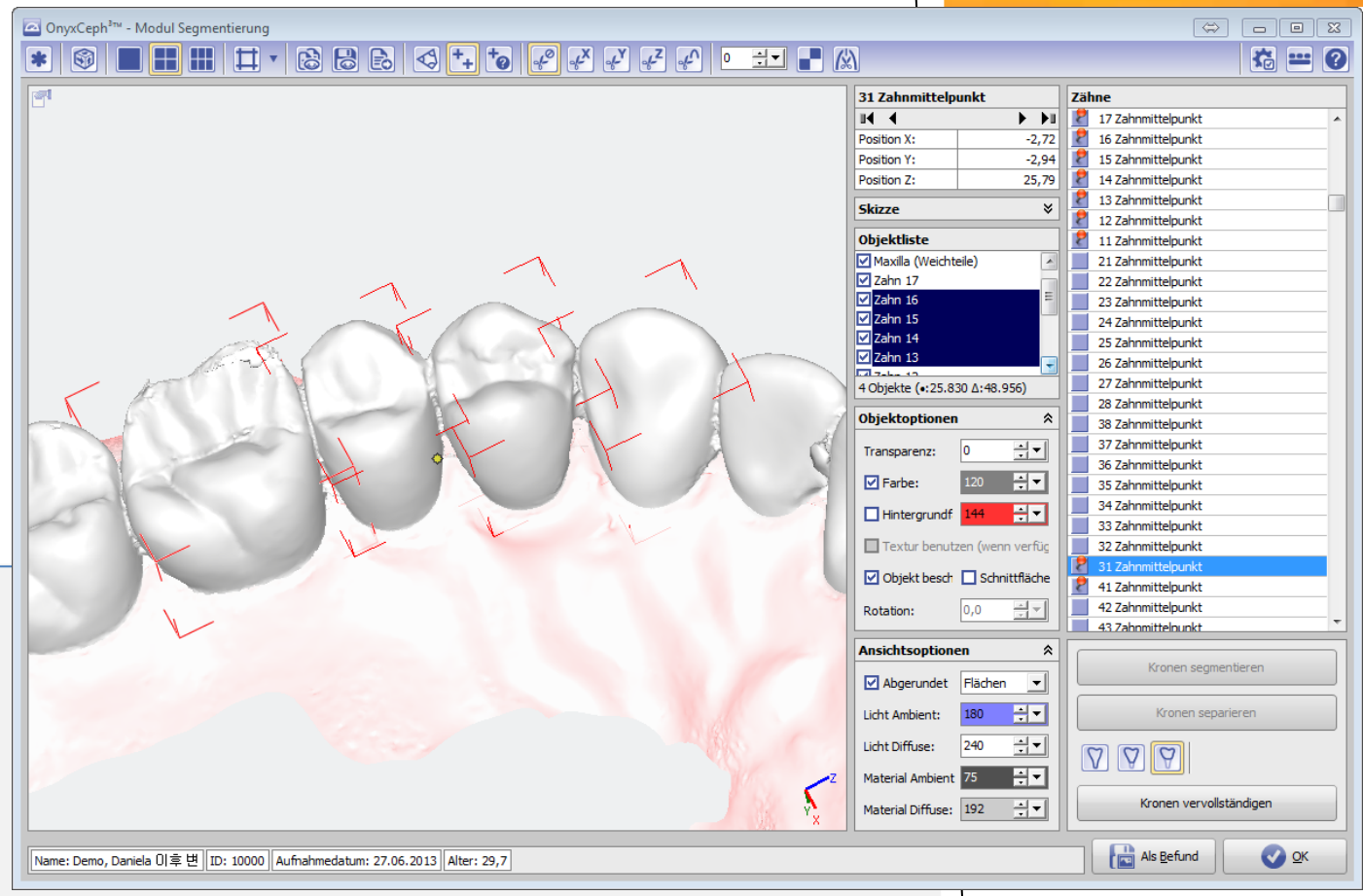

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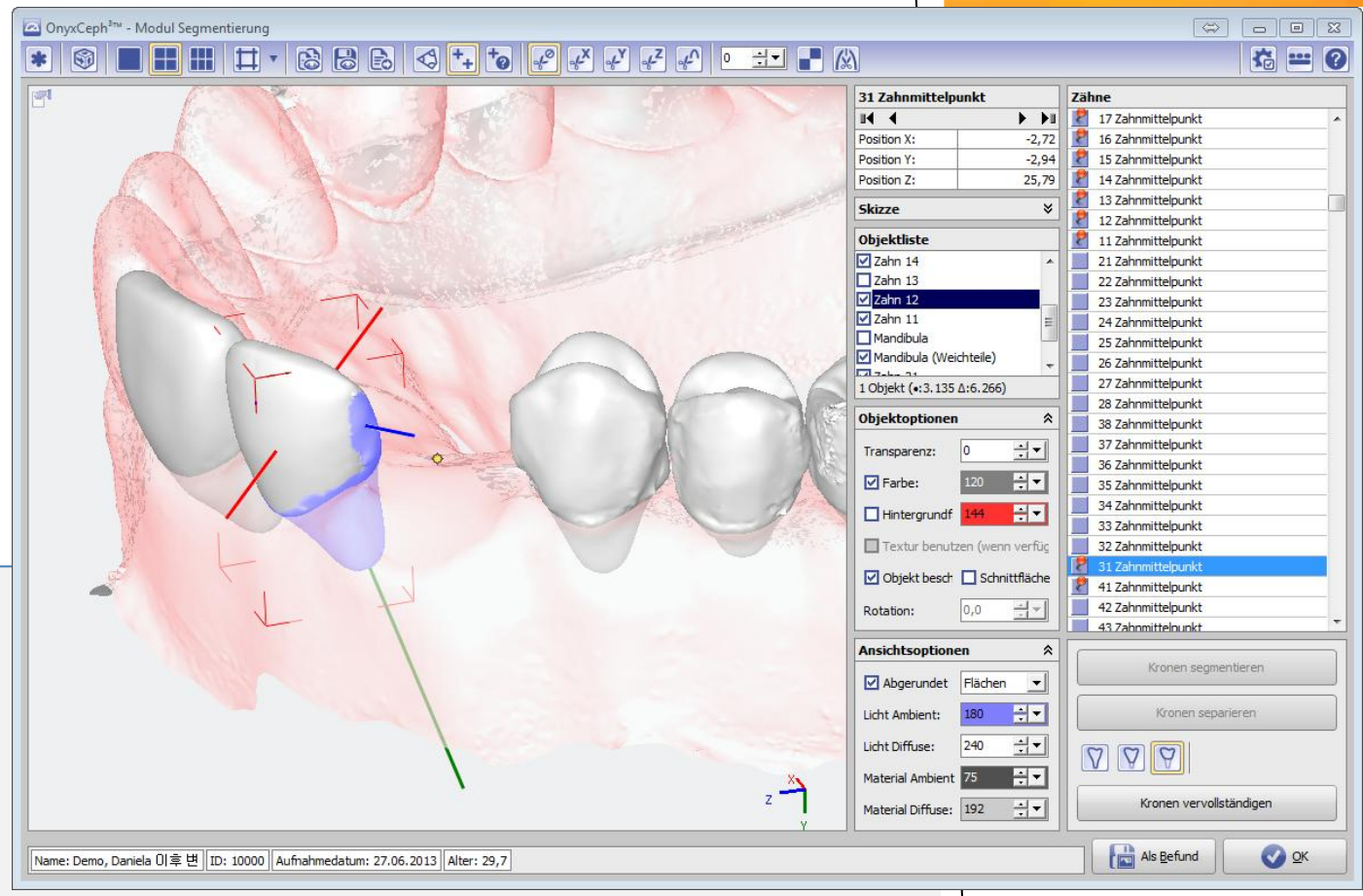

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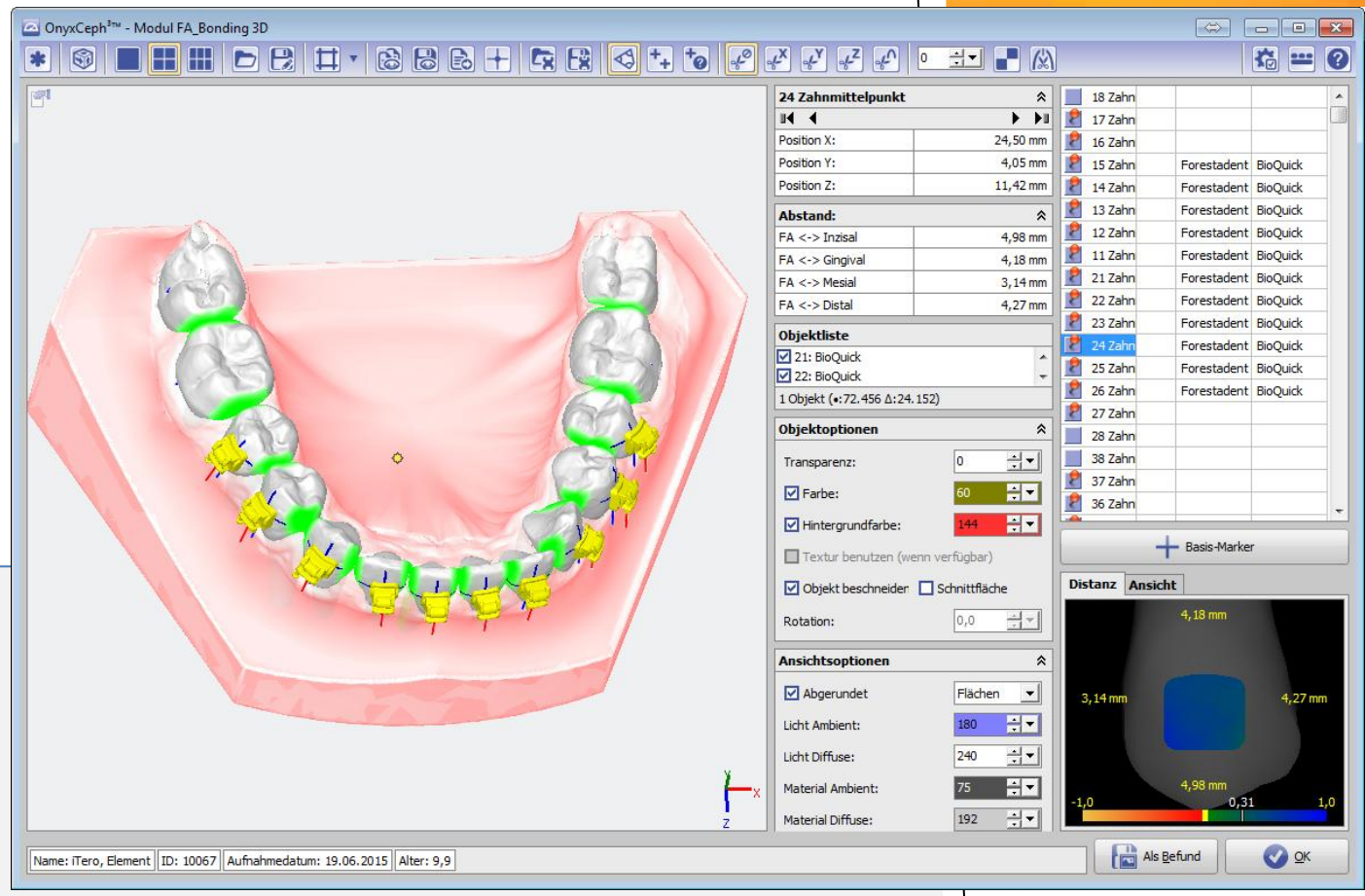

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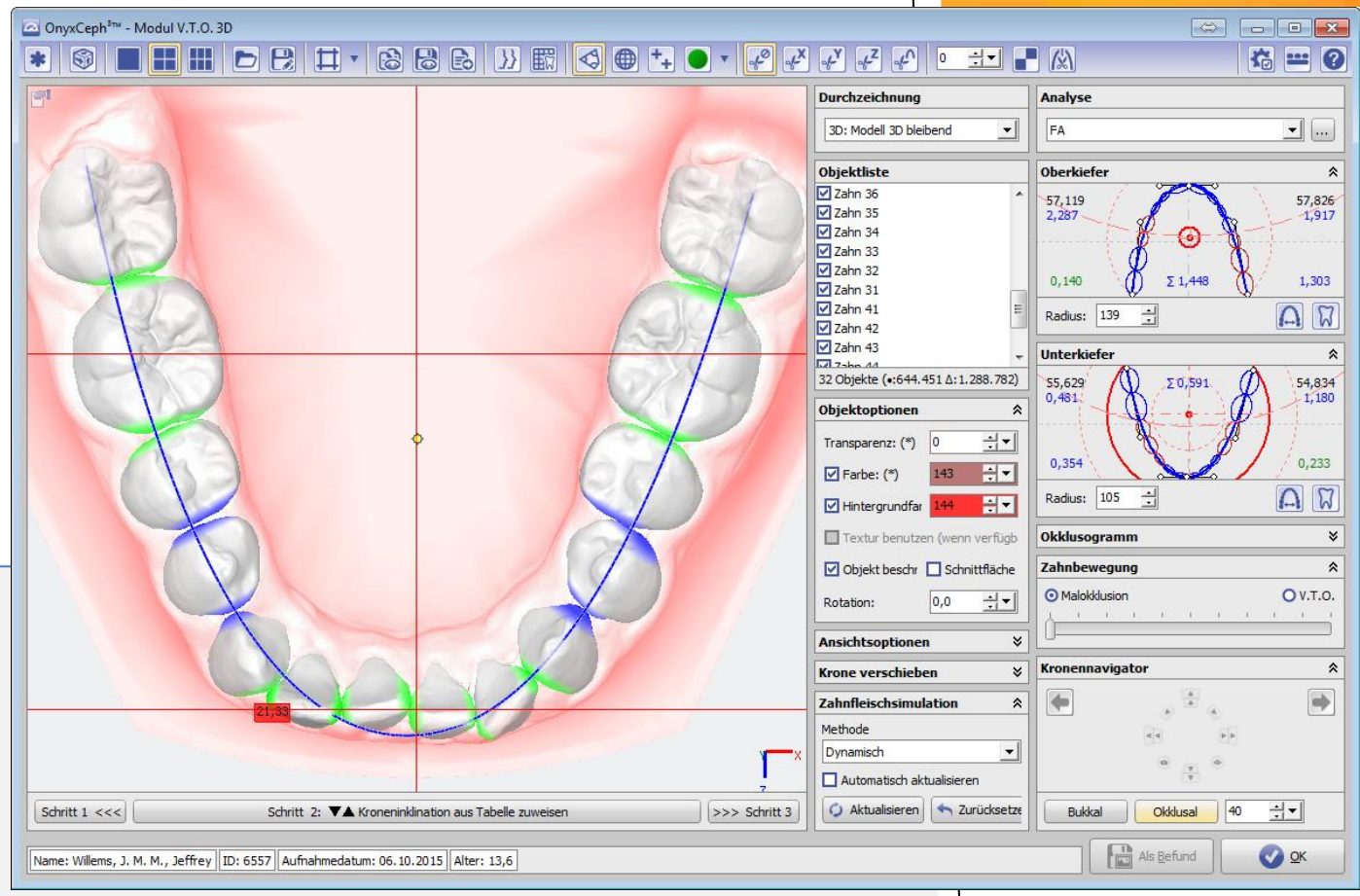

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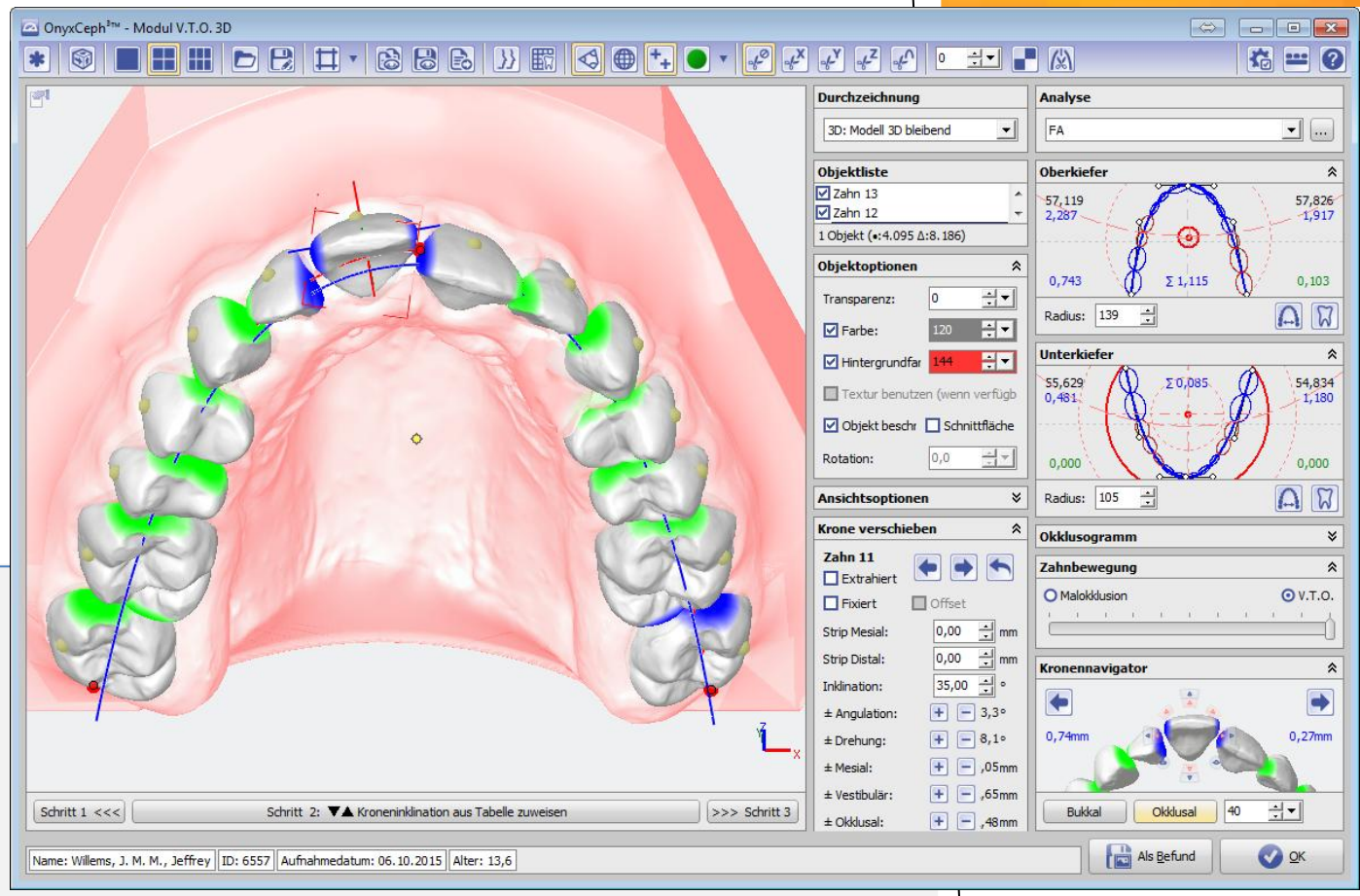

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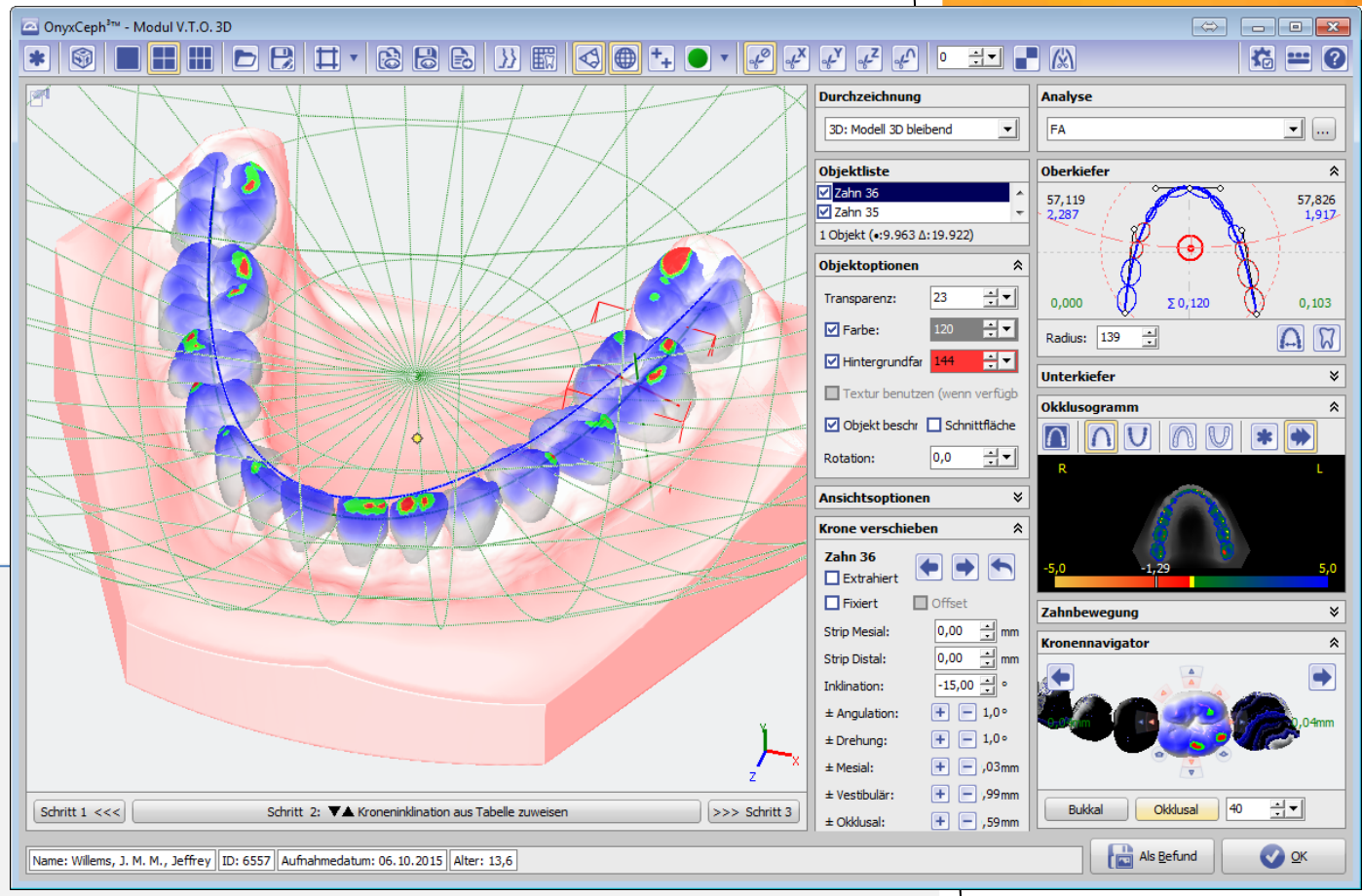

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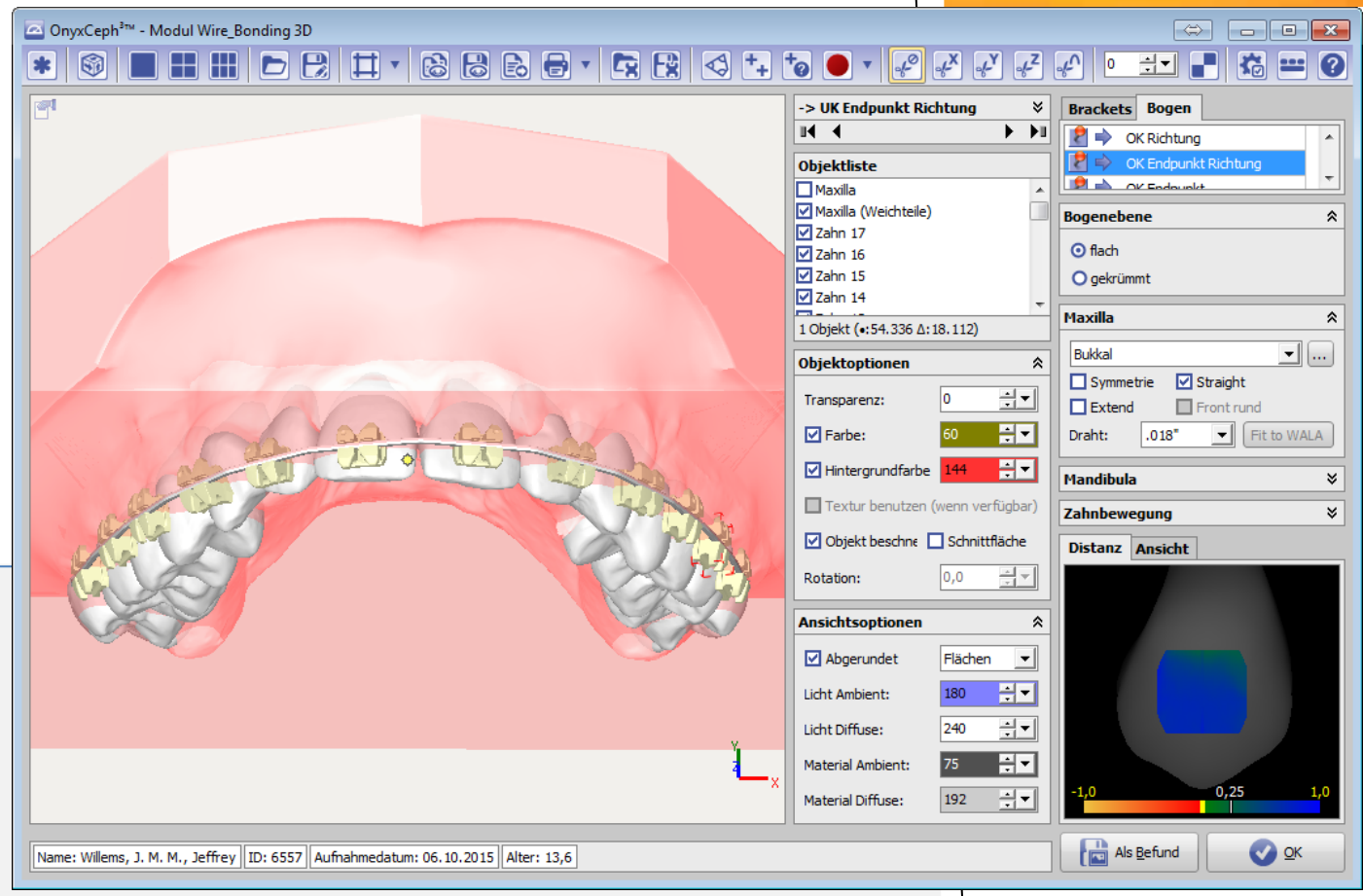

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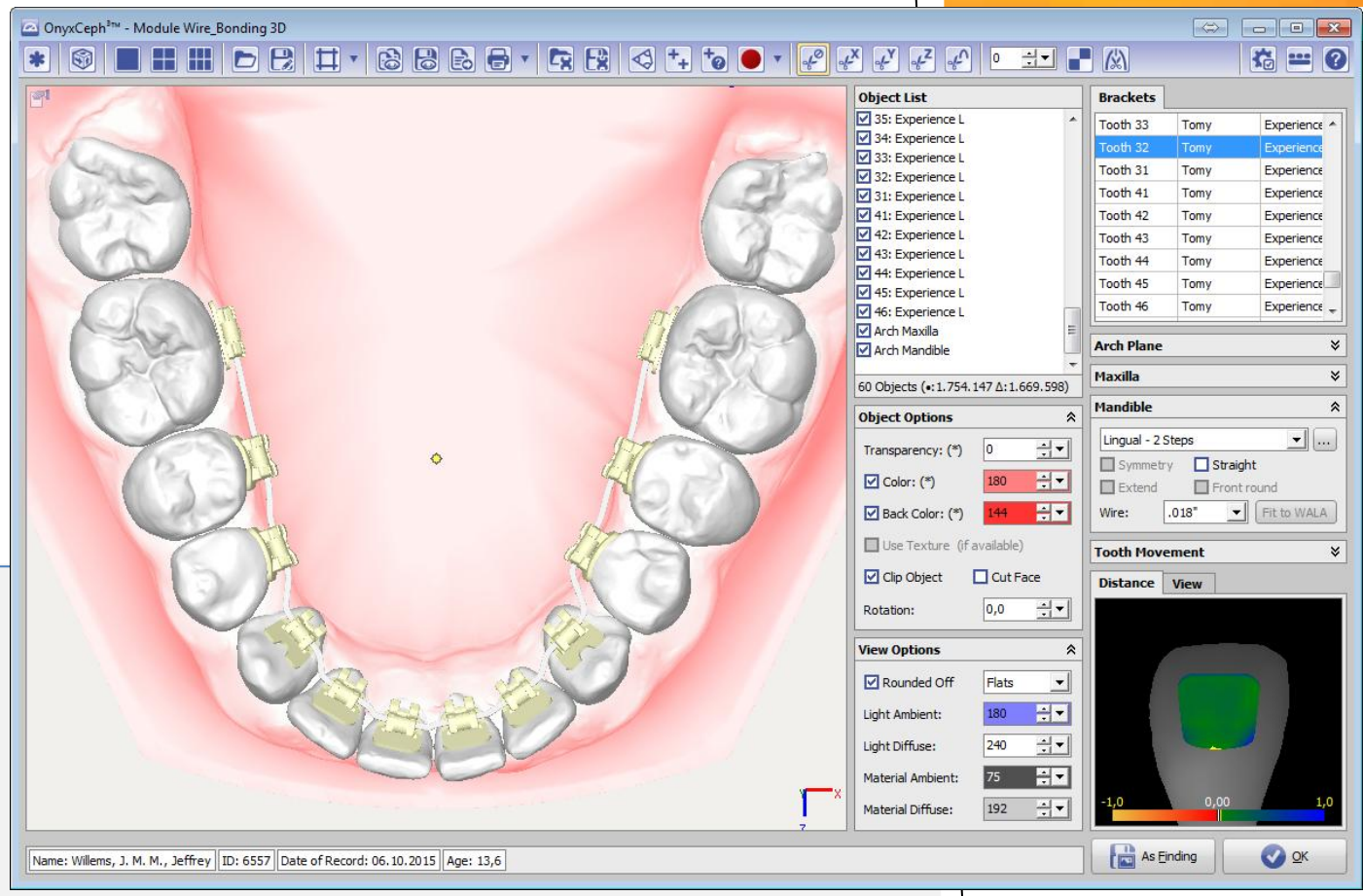

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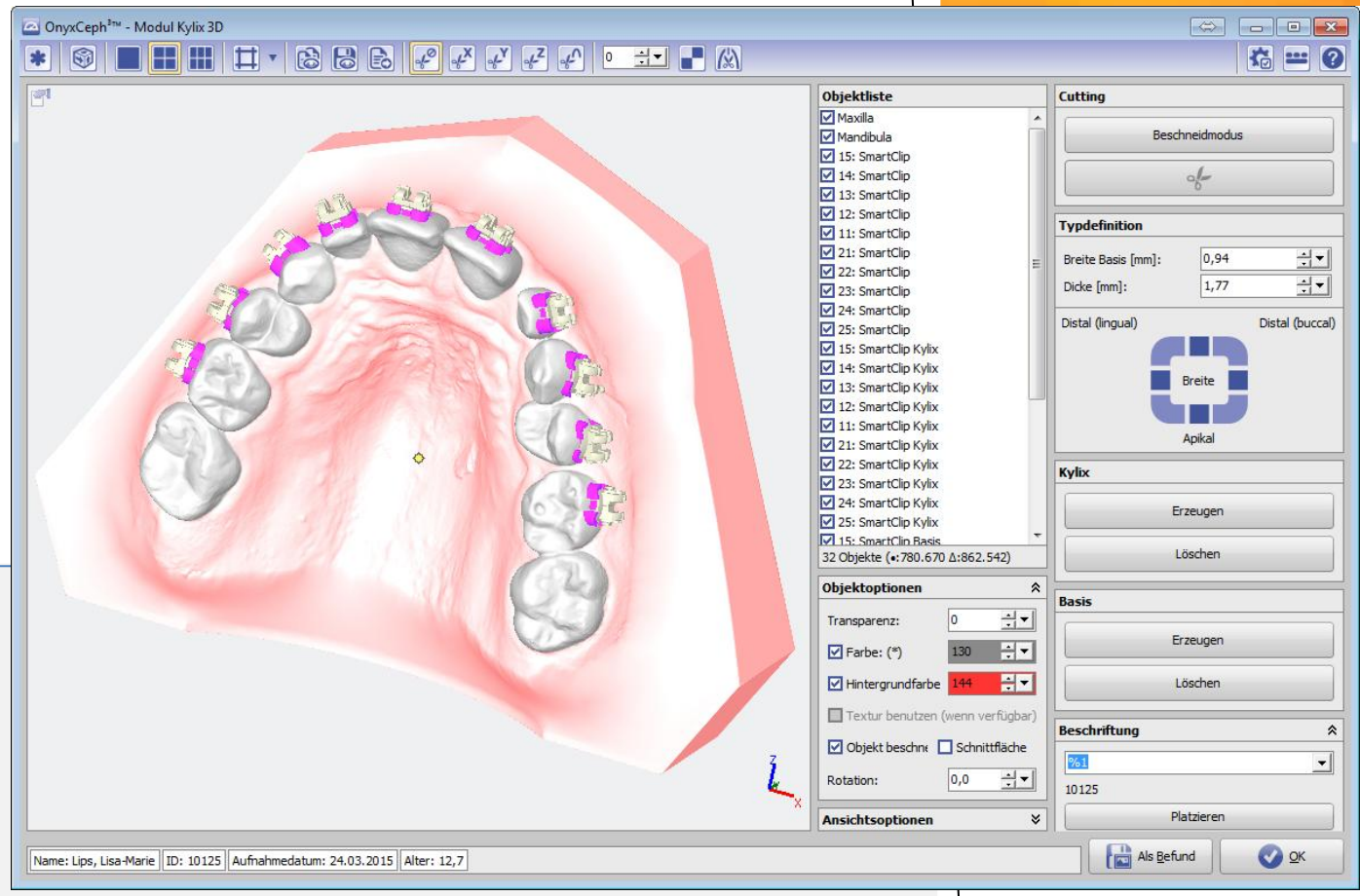

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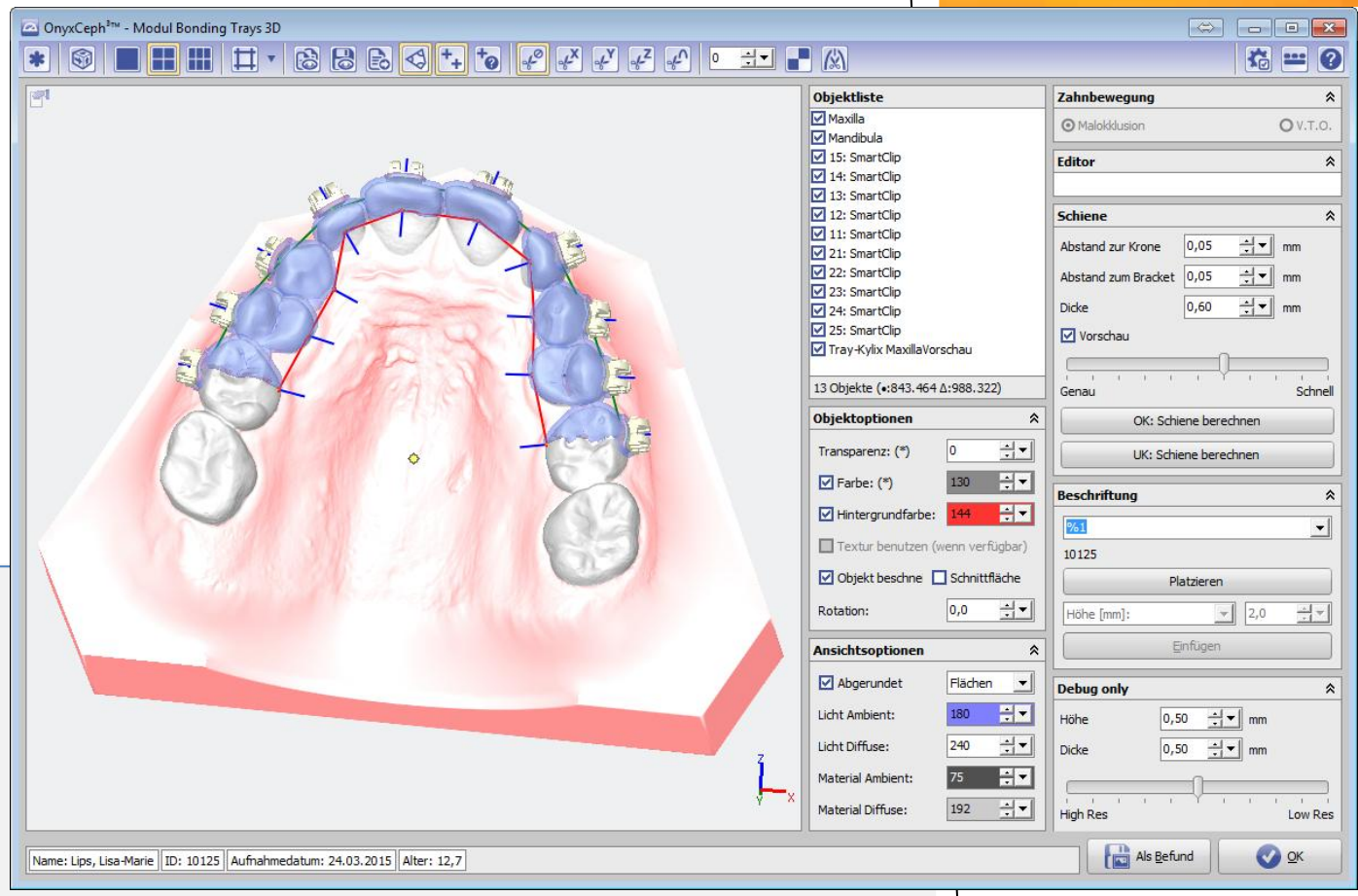

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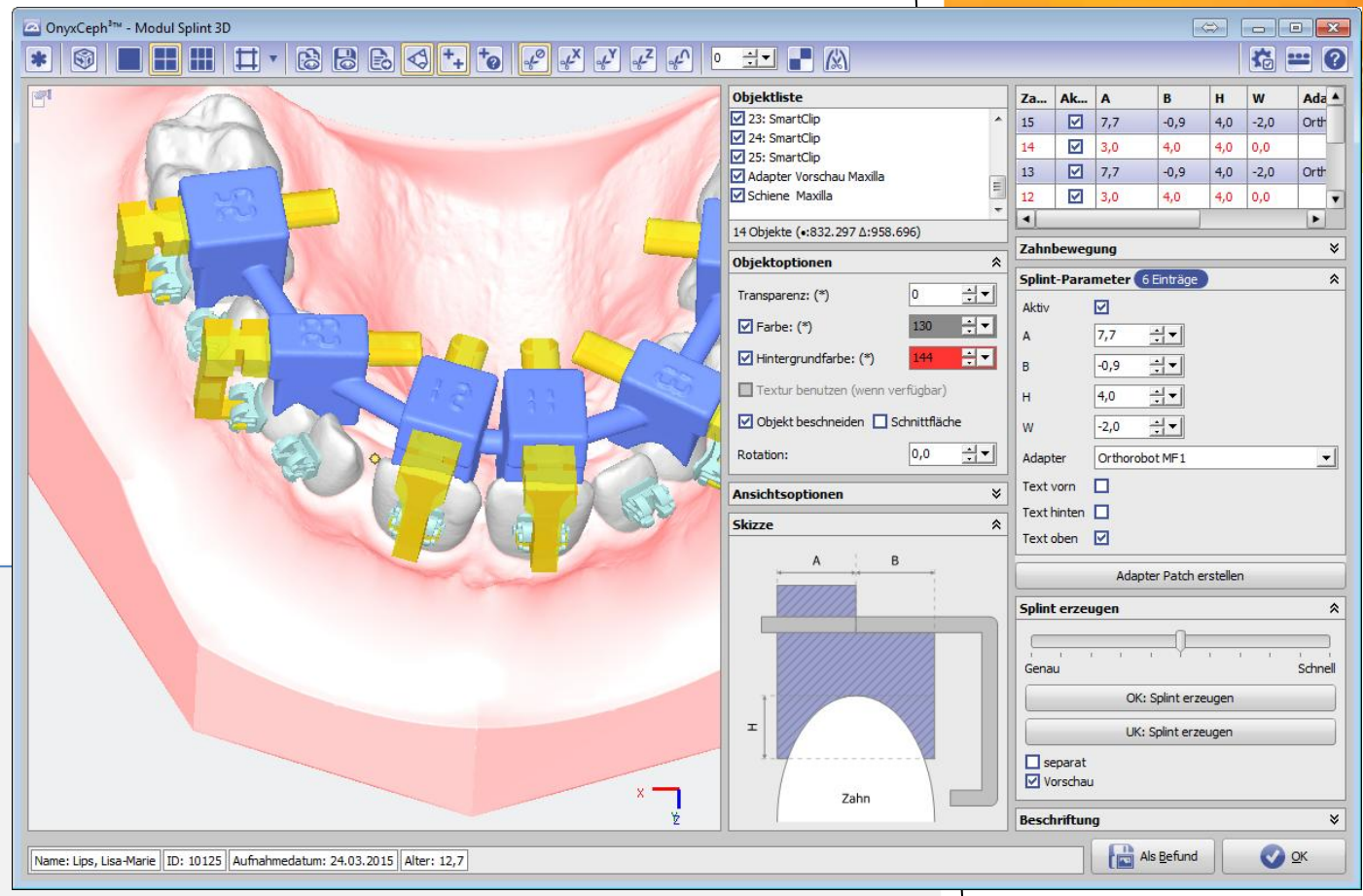

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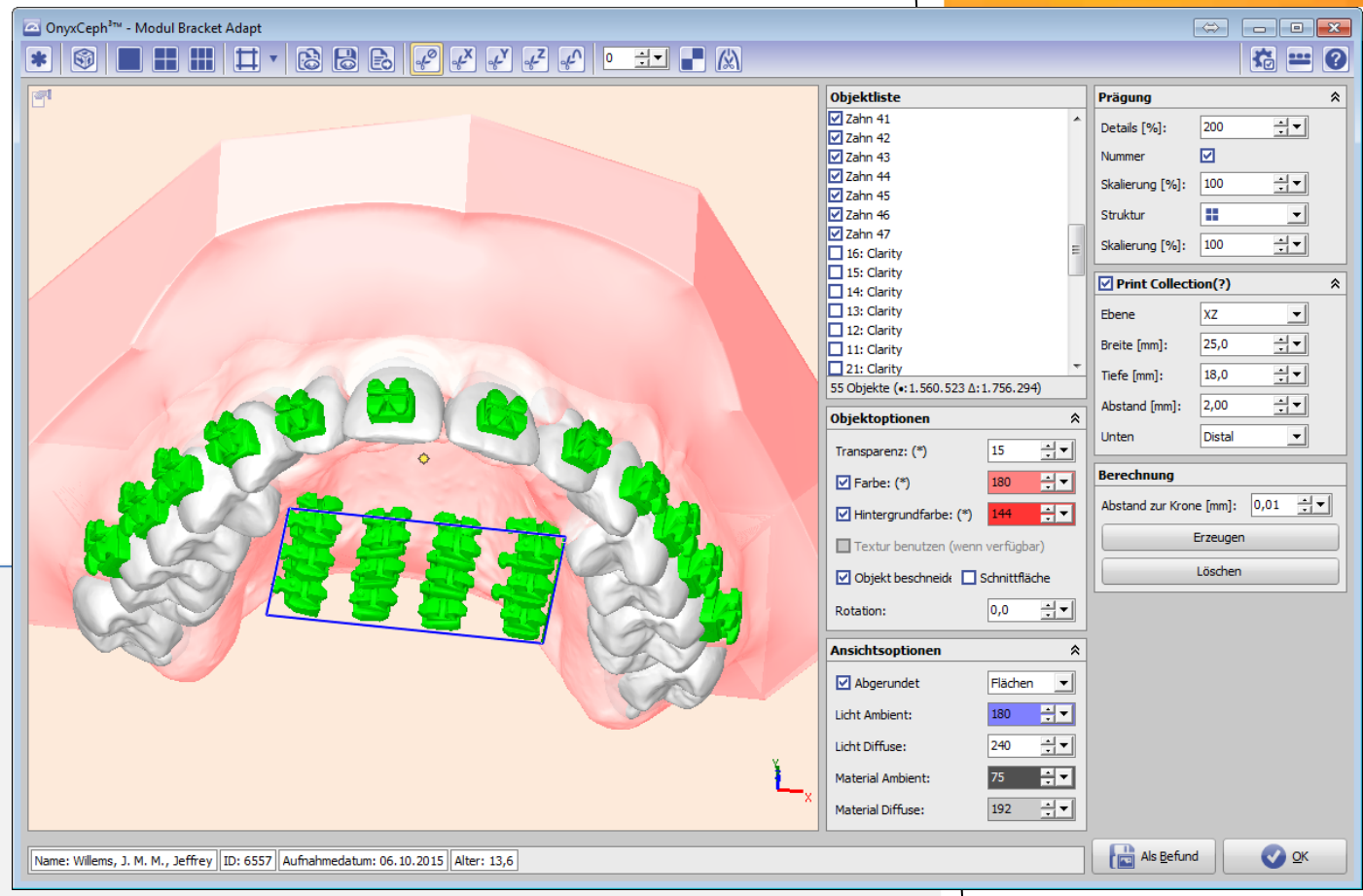

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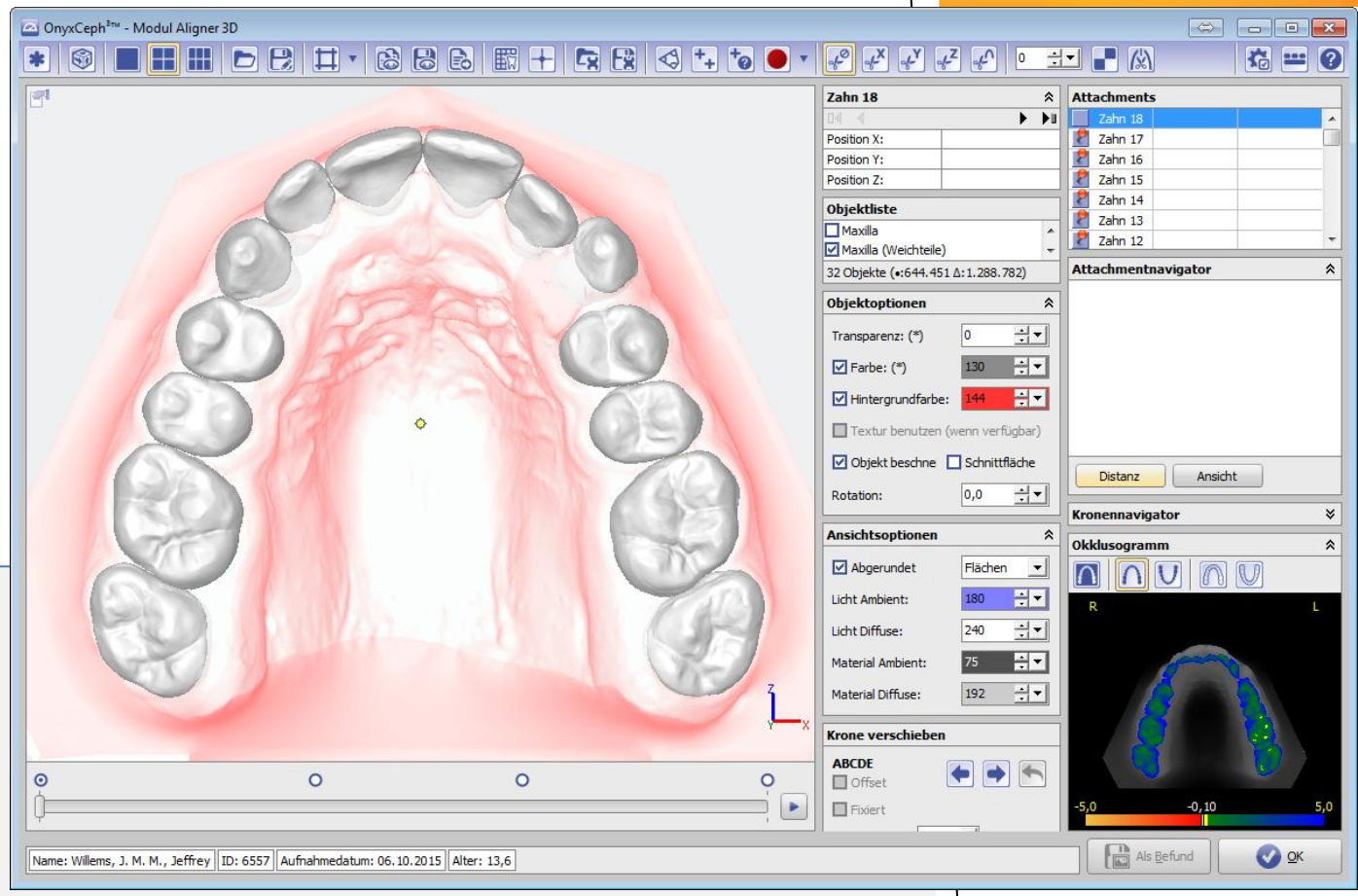

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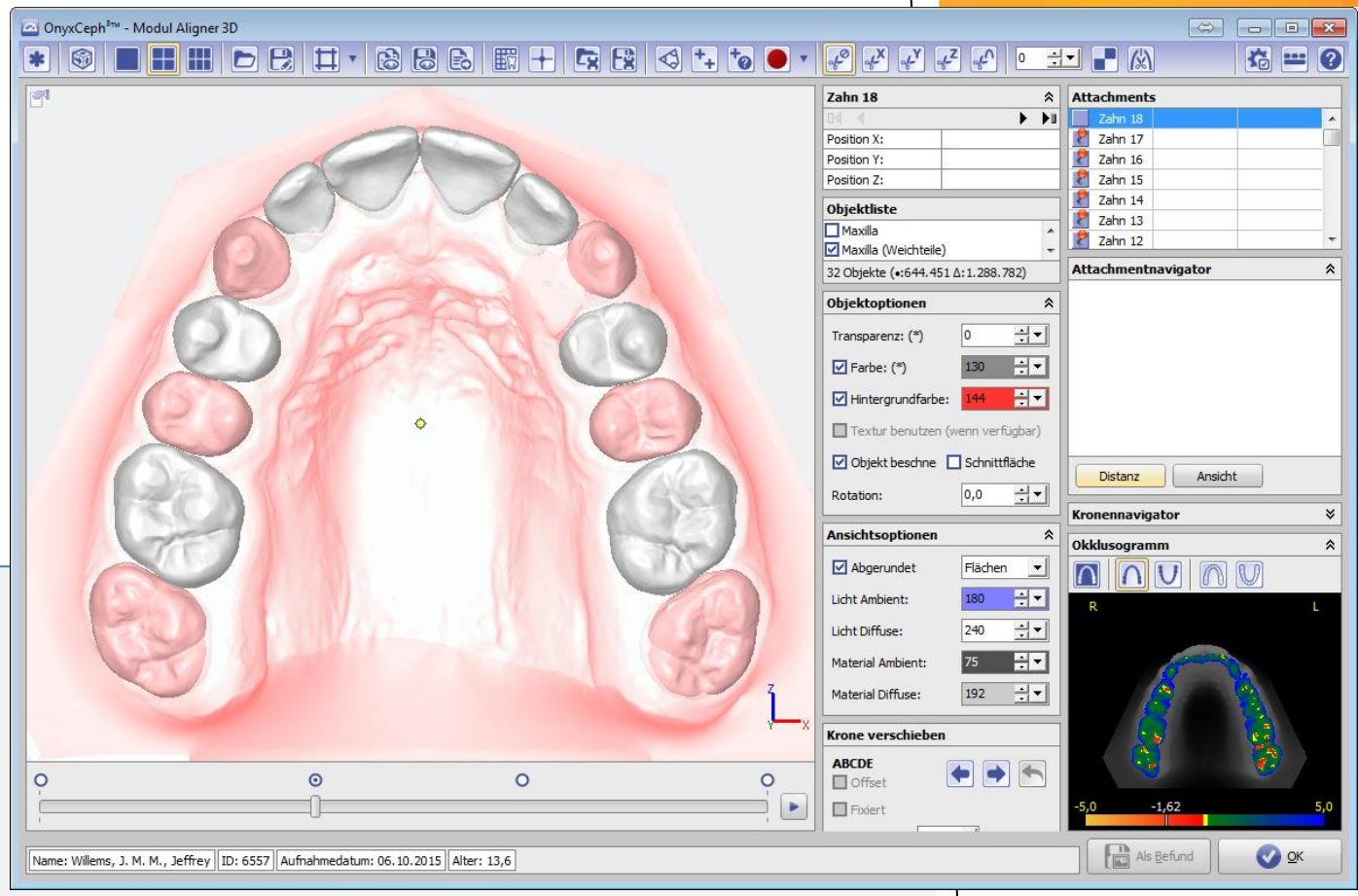

OnyxCeph³™

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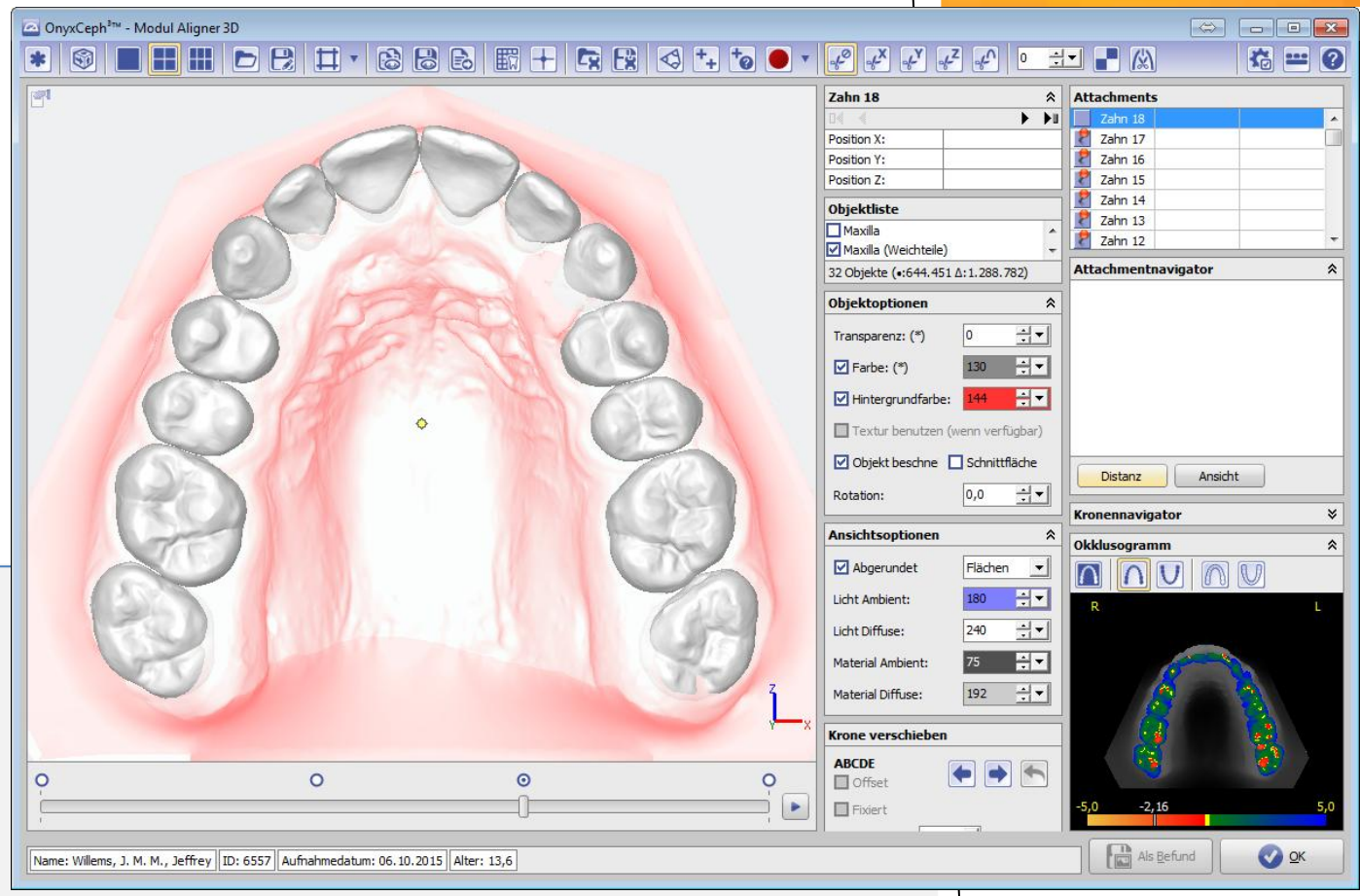

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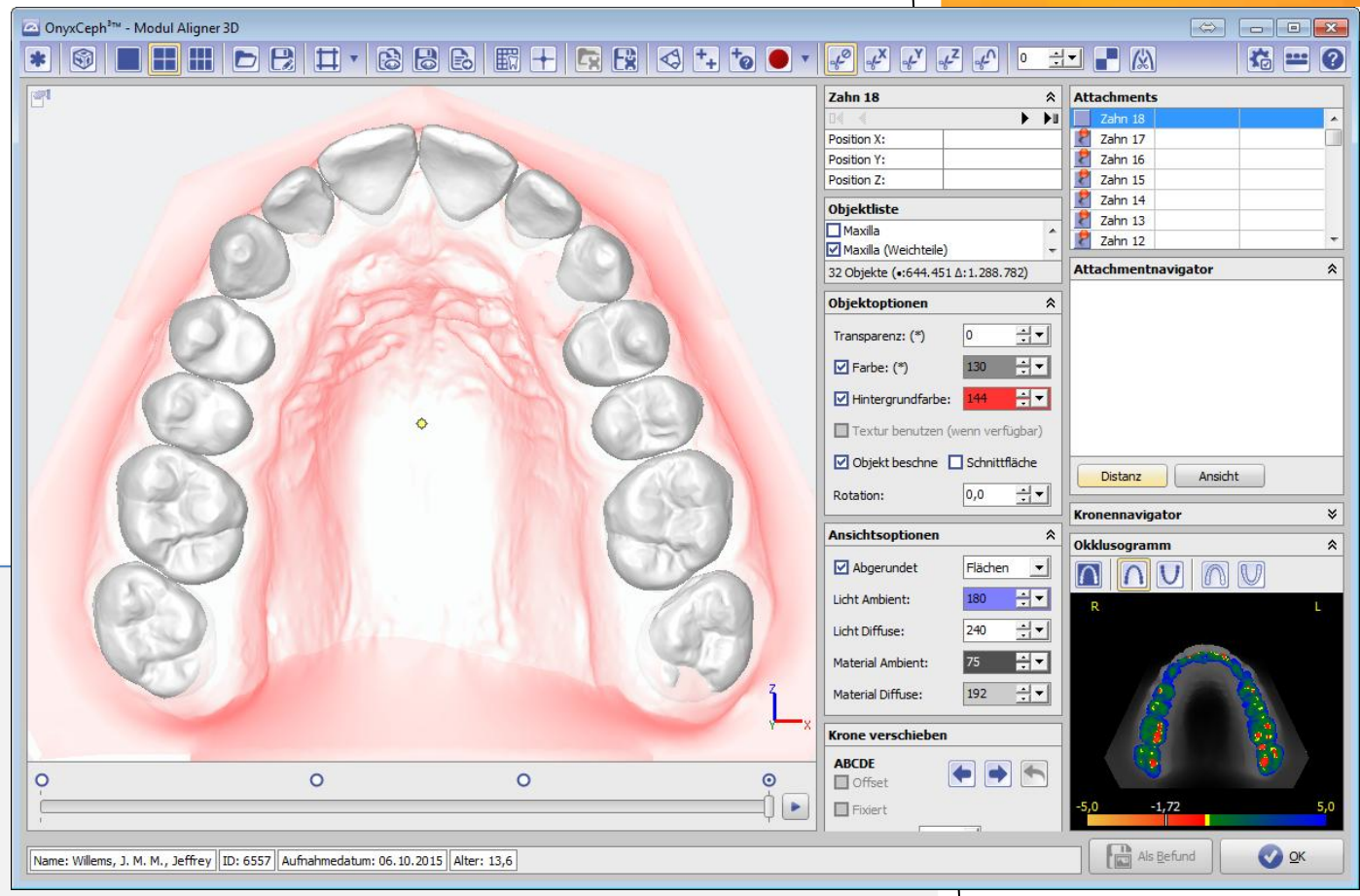

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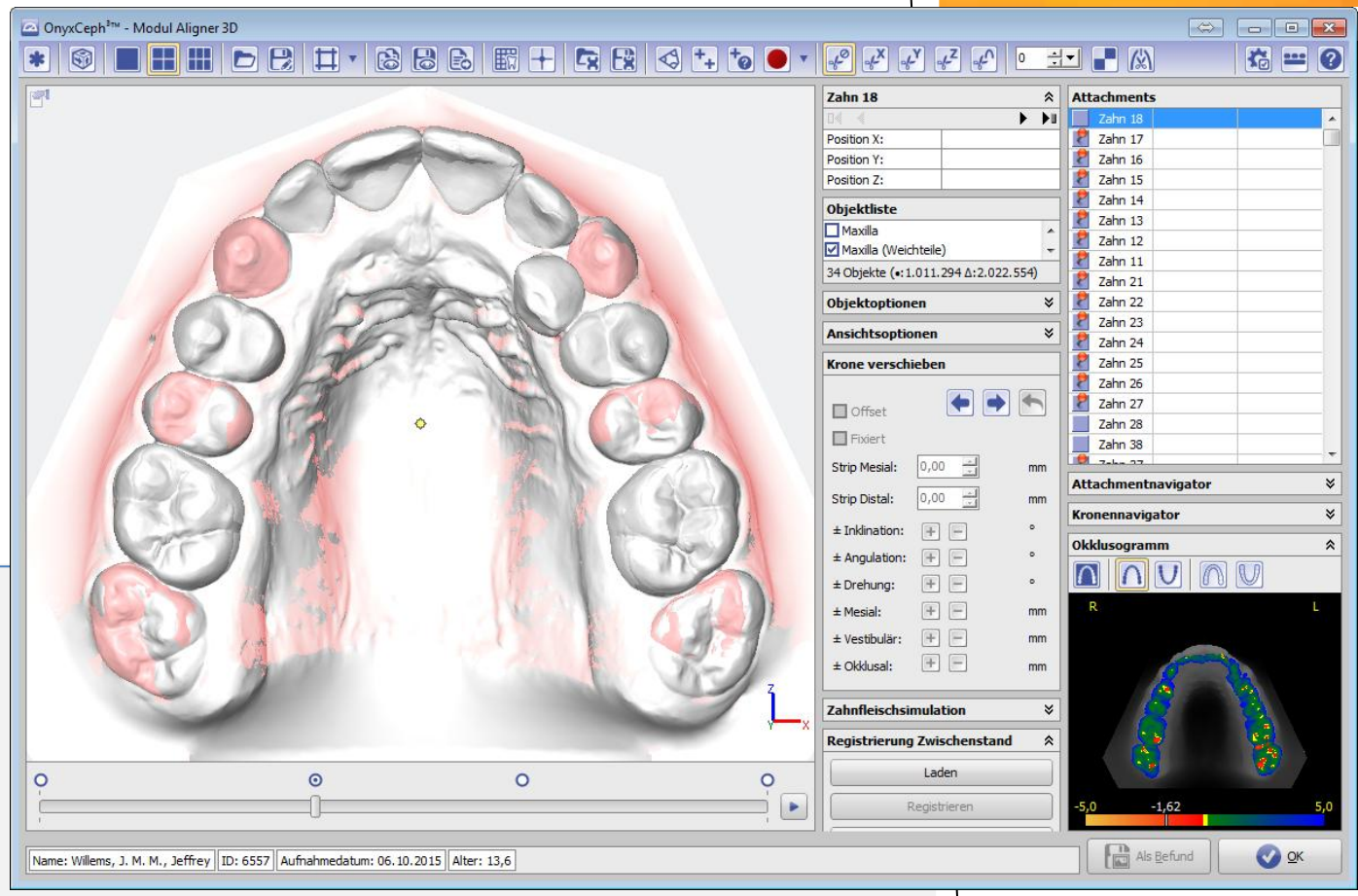

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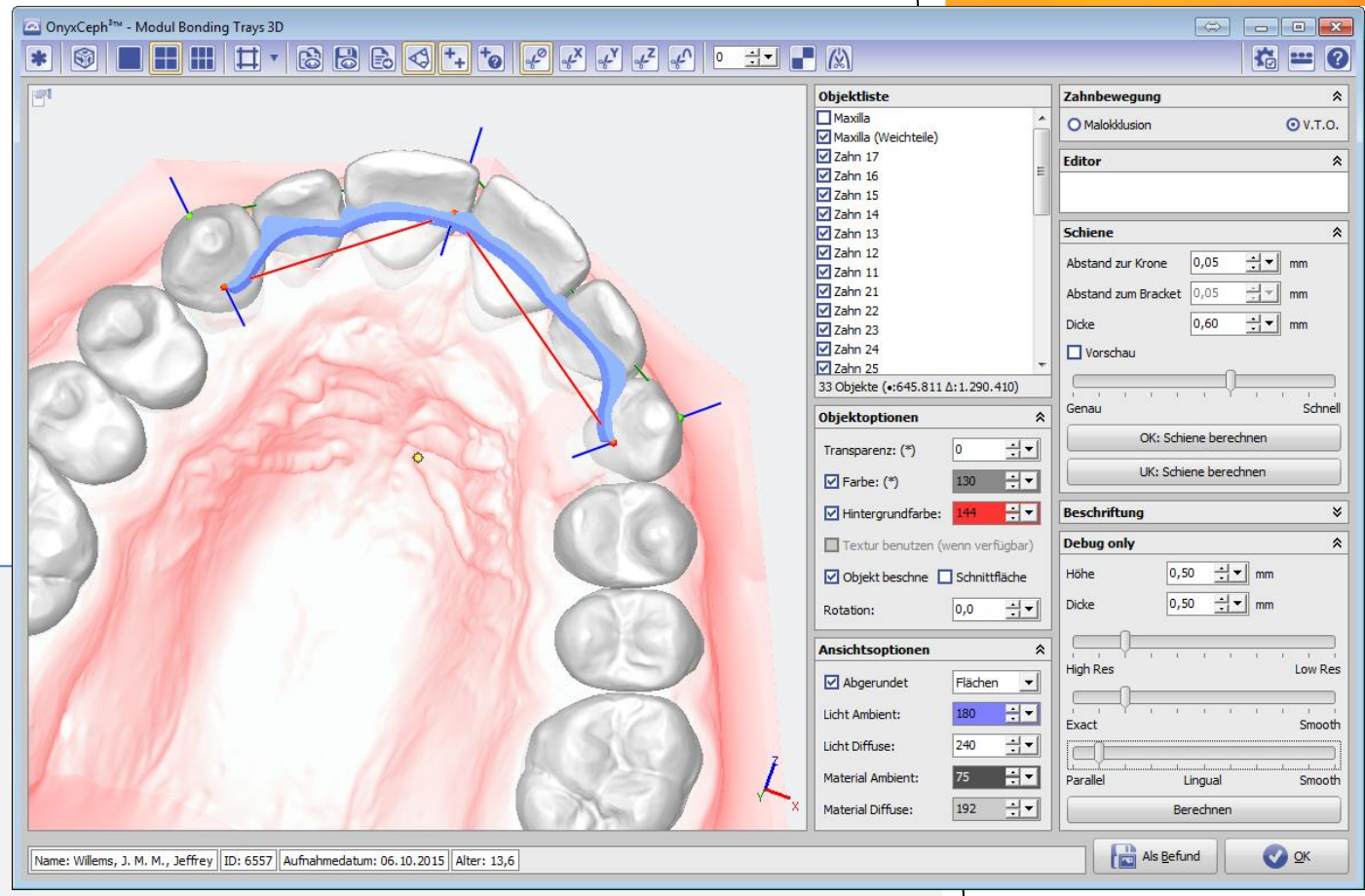

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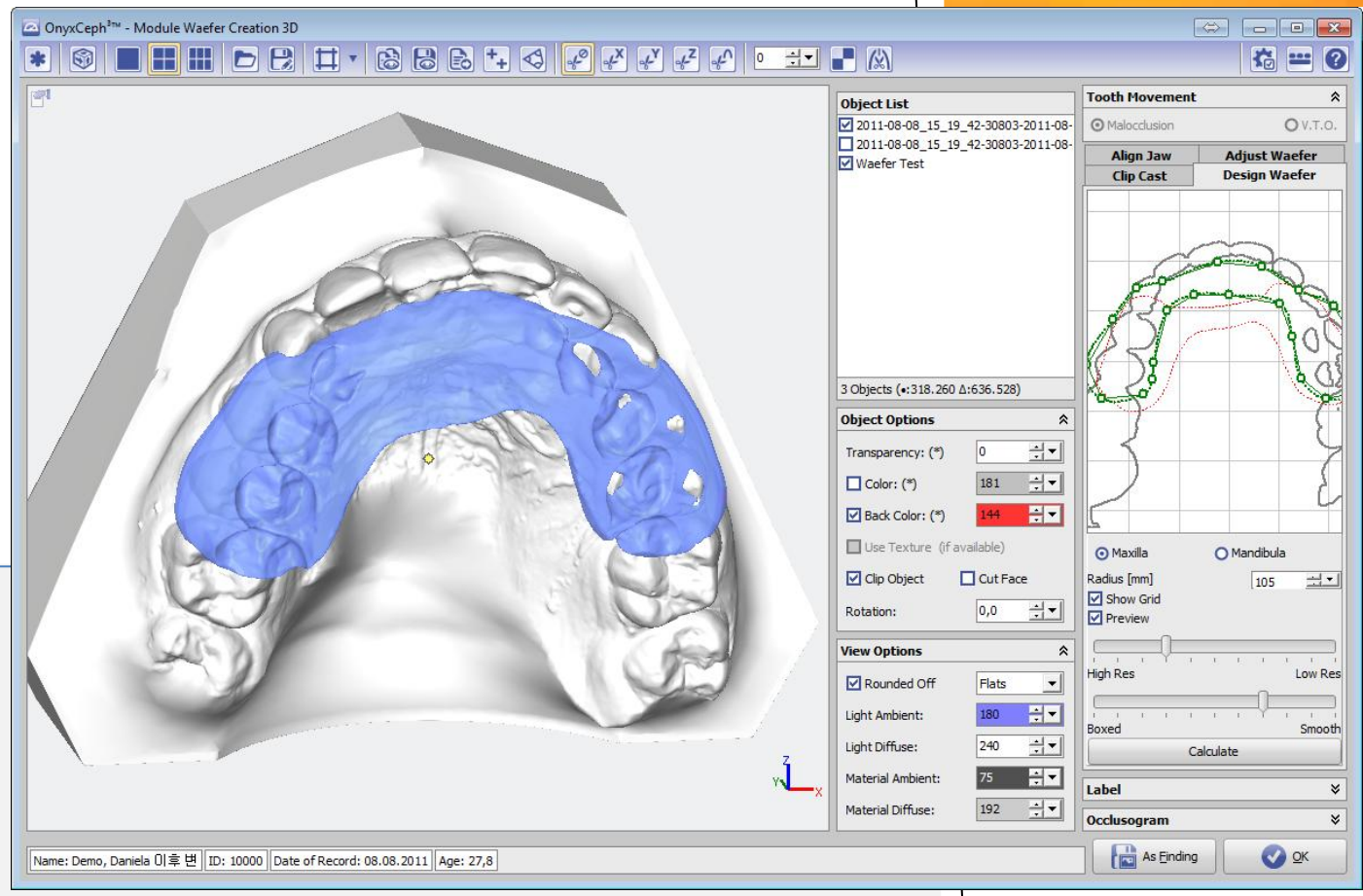

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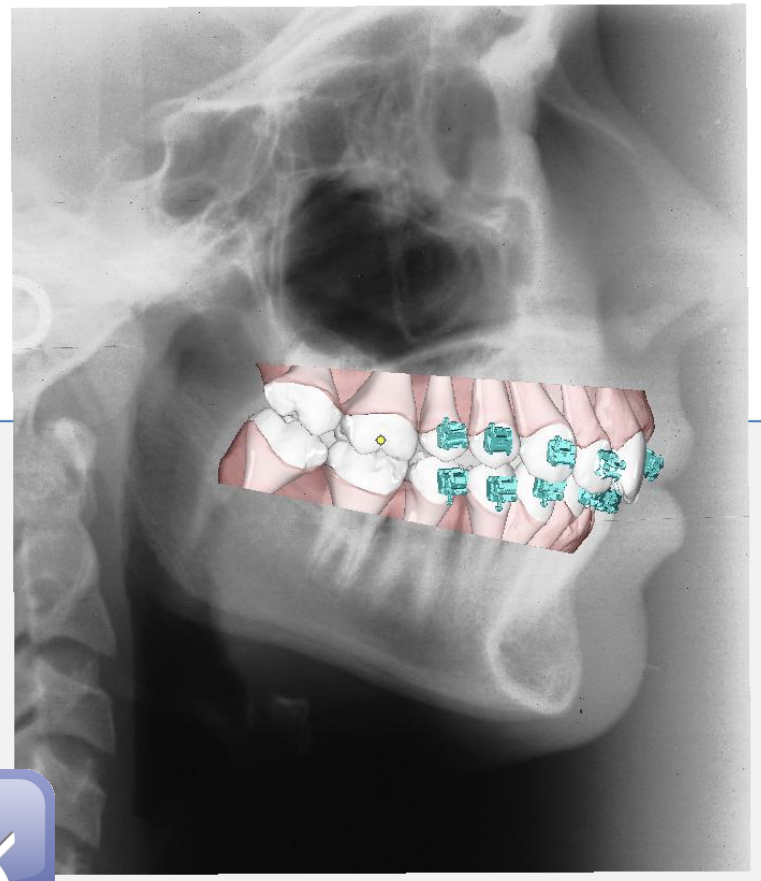
Overview OnyxCeph³™



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Ricketts V.T.O.
Image Comparison

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OnyxCeph³™

Digital i/d Bonding

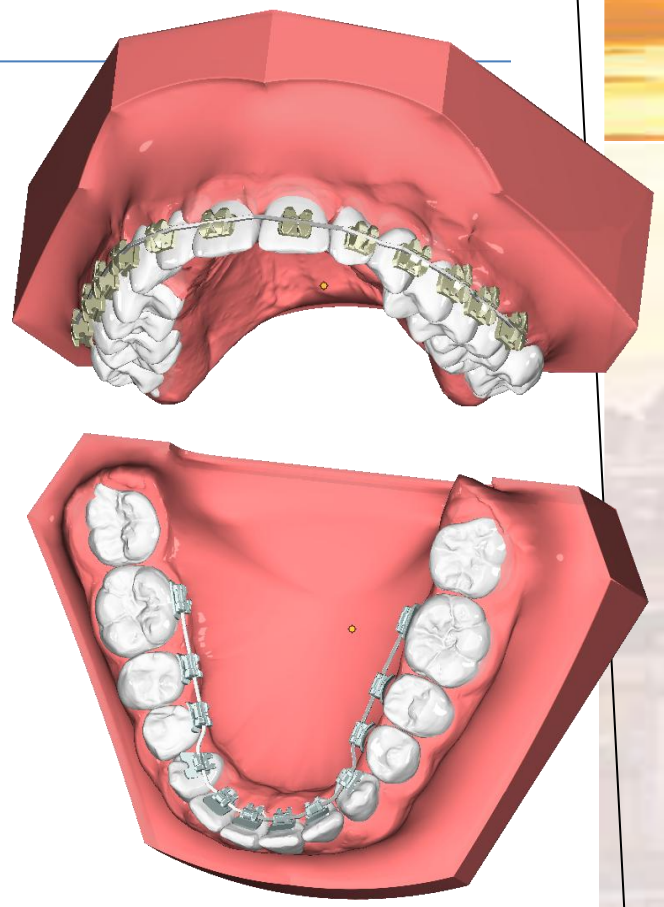
Introduction
Overview OnyxCeph³™

Workflow
- Preparation

FA_Bonding
Wire_Bonding
- Virtual Setup
- Bracket-/Wire-Placement

Bracket Position Transfer
- Indirect Methods
- Direct/Mixed Methods

Other Planning Options (Examples)
Summary



Digital i/d Bonding

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Overview OnyxCeph³™

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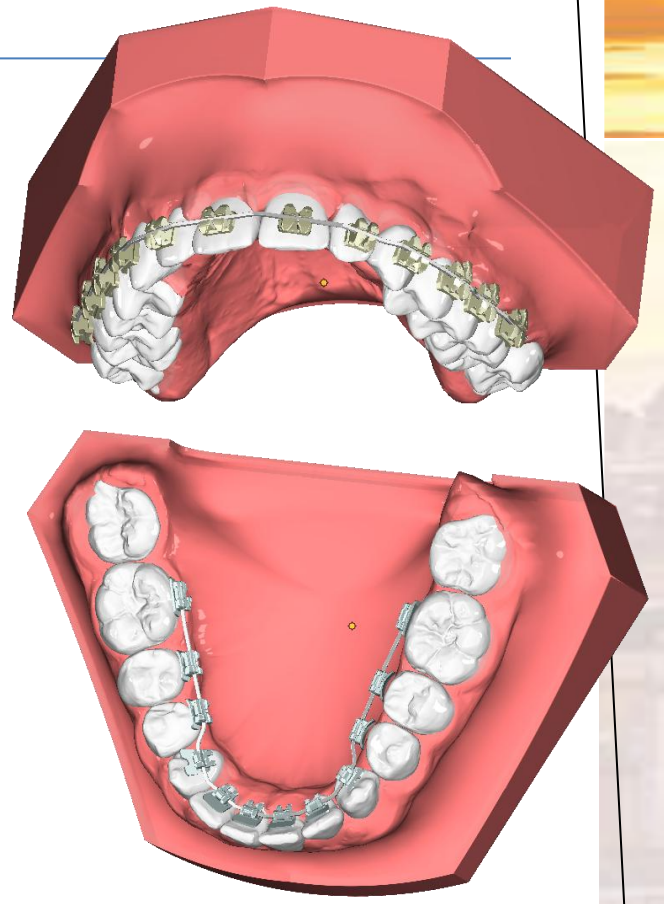
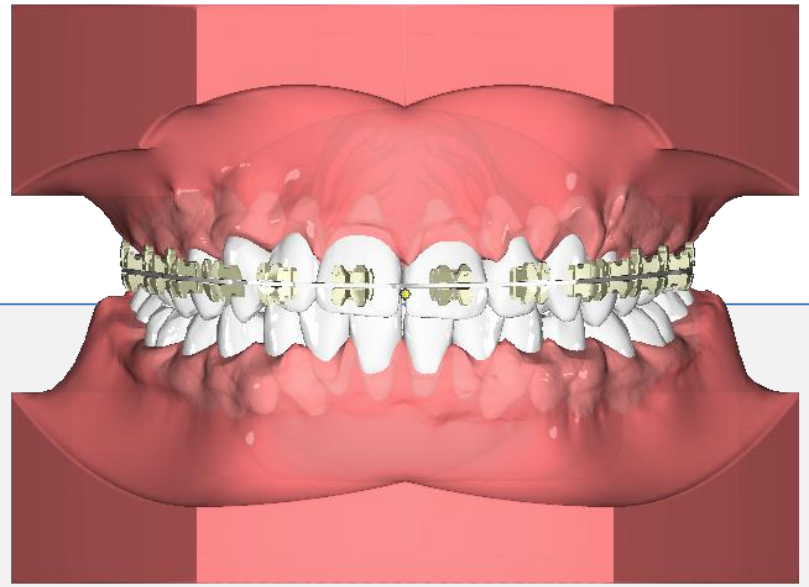


Workflow



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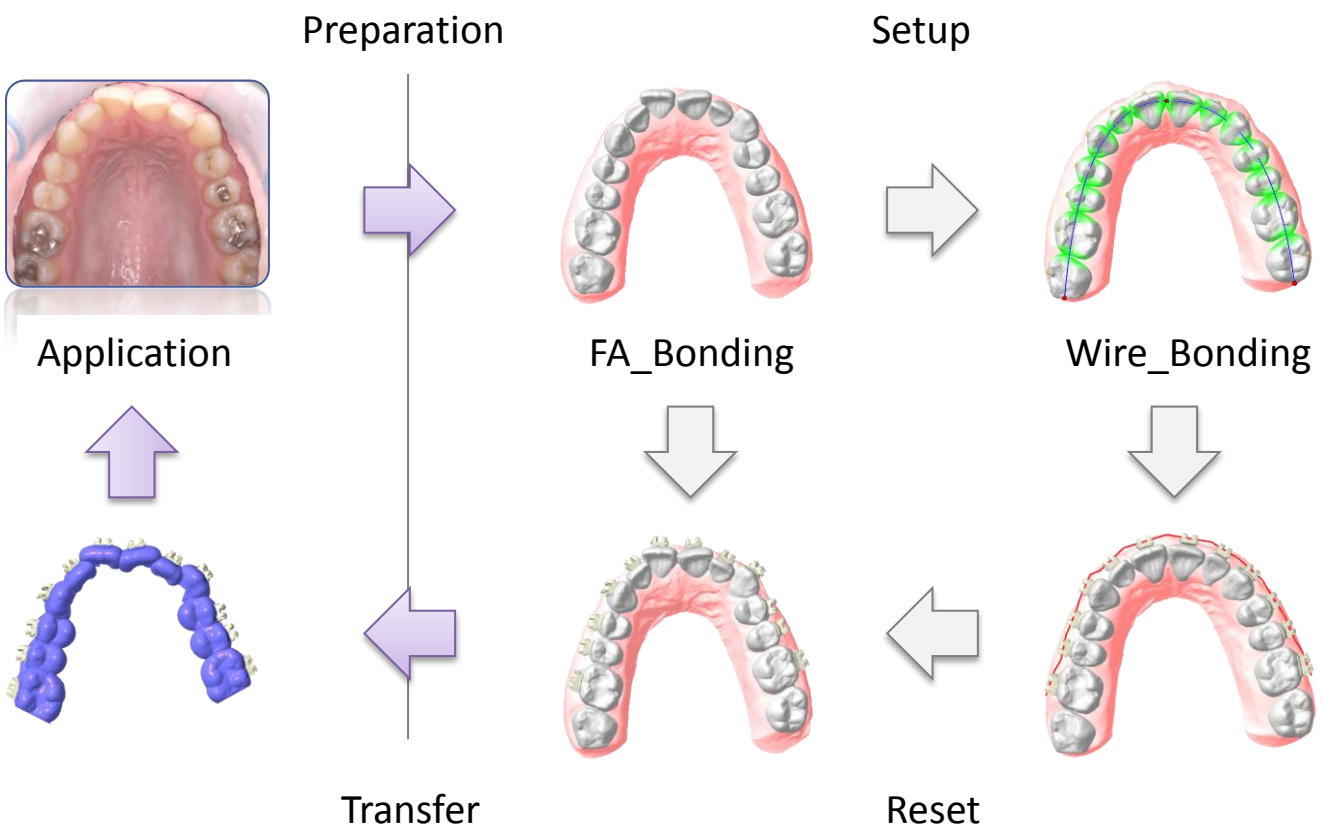
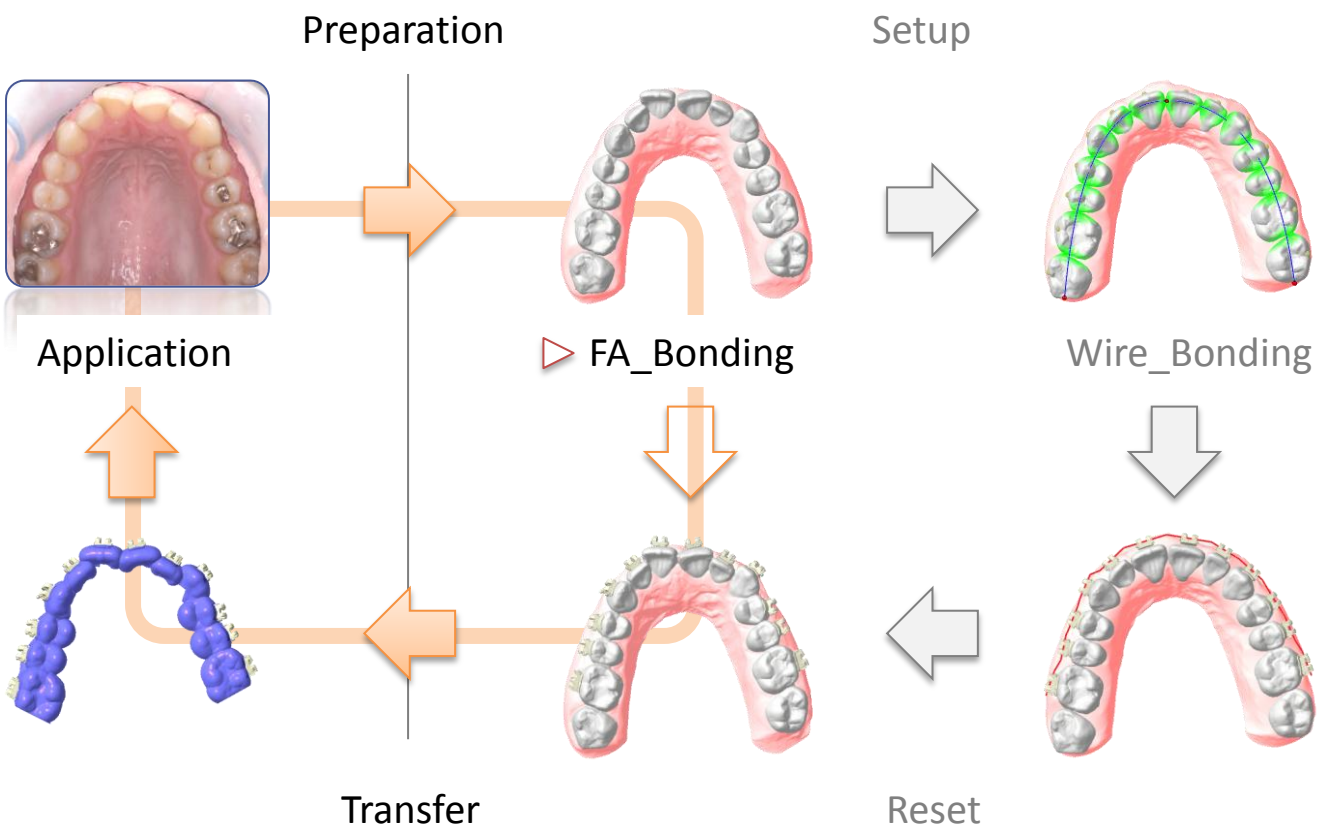
OnyxCeph³™

Workflow

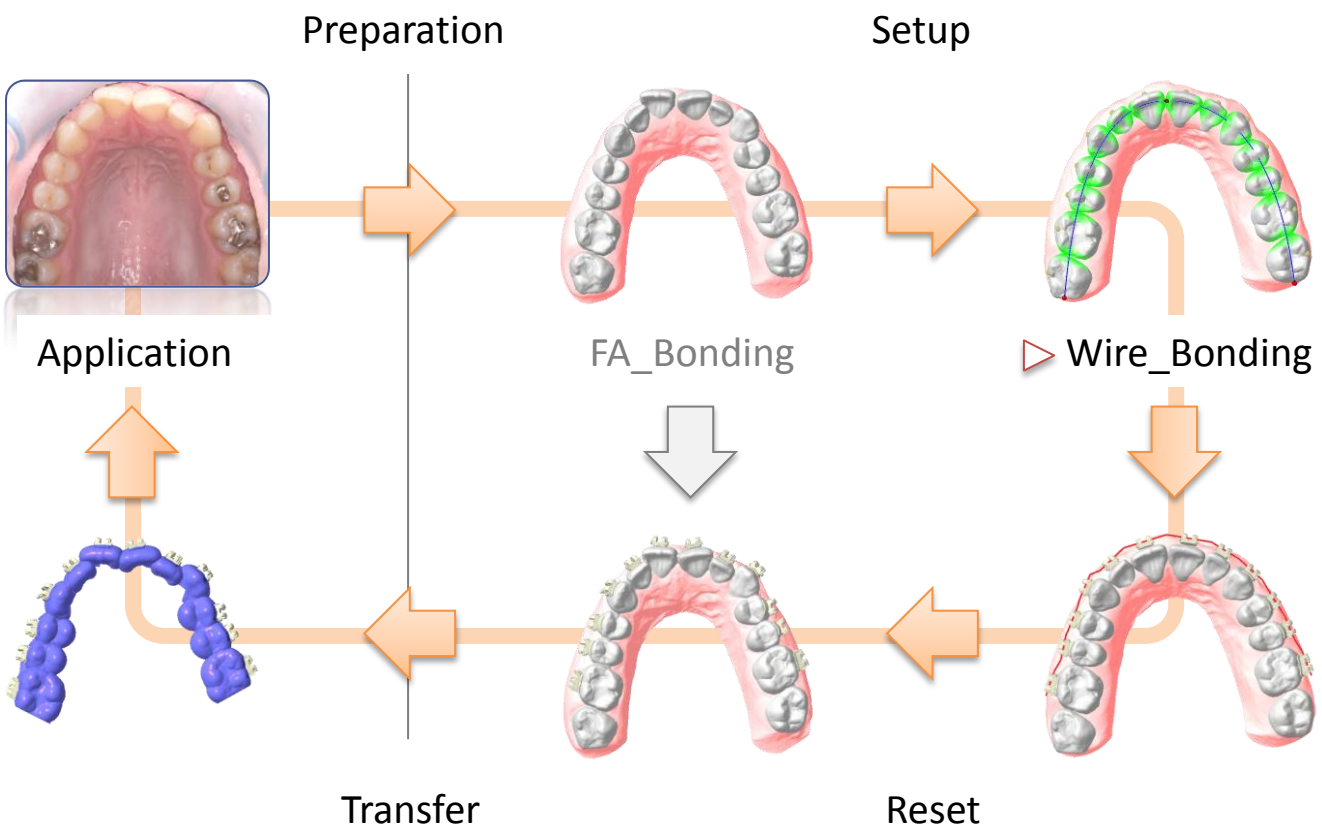

Preparation
Setup
Application
FA_Bonding
Wire_Bonding
Transfer
Reset

Workflow



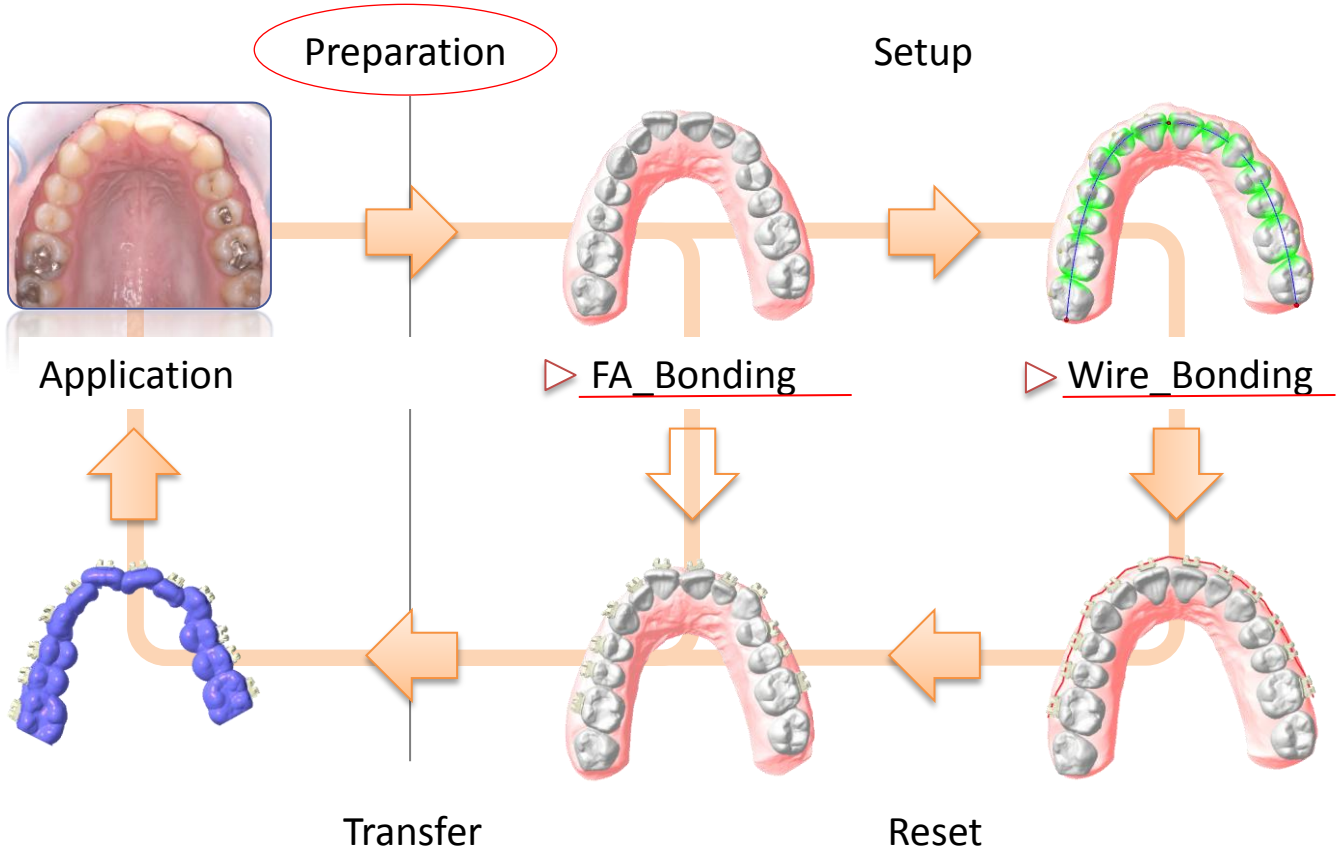
Workflow : FA_Bonding vs. Wire_Bonding

Workflow



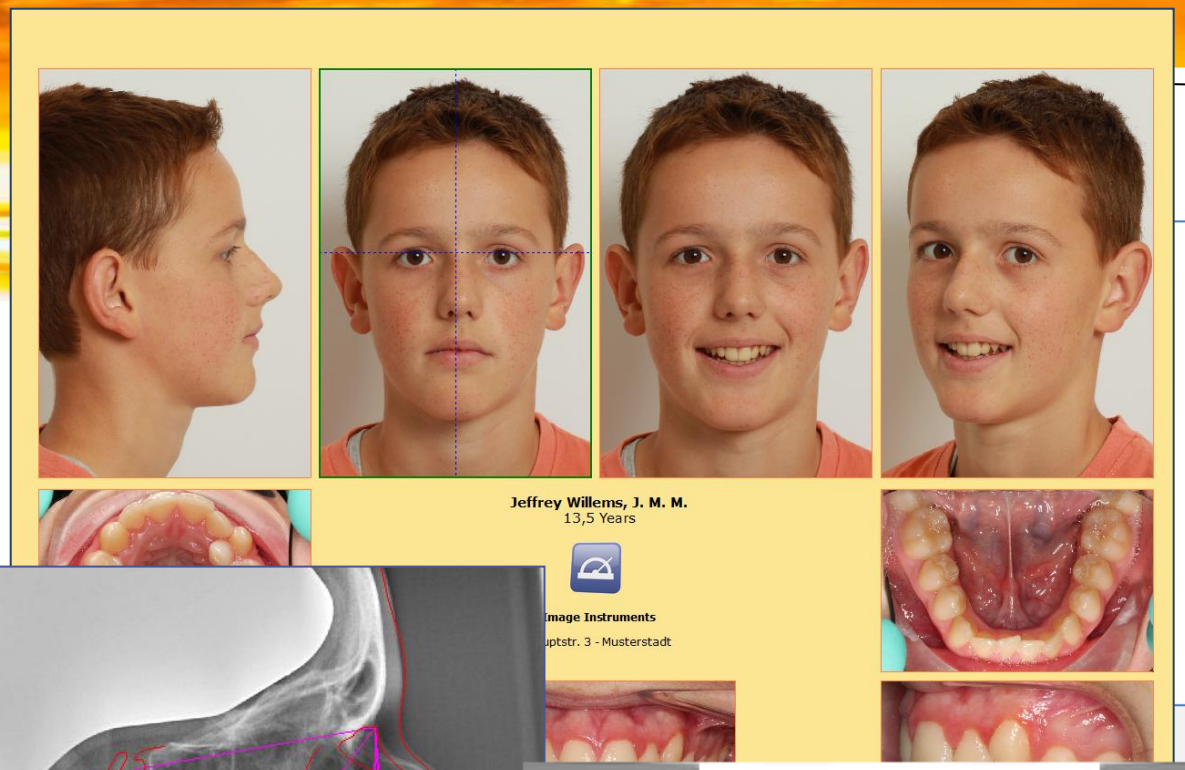
Workflow : FA_Bonding vs. Wire_Bonding

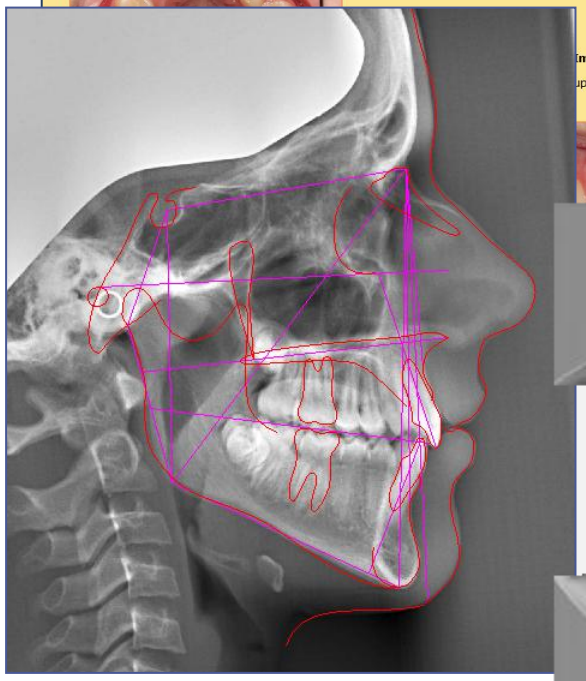
Workflow

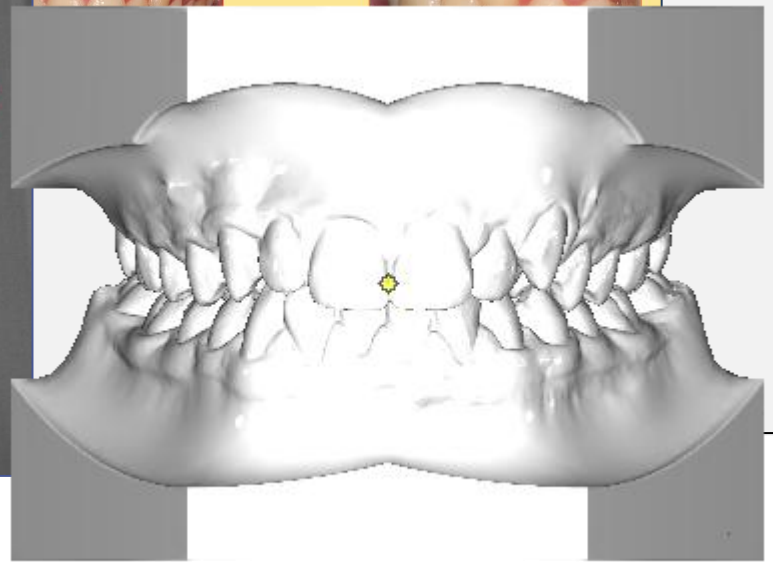


Workflow : FA_Bonding vs. Wire_Bonding

13rd A.I.O.T. National Congress







Add Image
Adjust Image
Edit
Digitize
Combine
Mirror
CO|CR Correction
Treatment Simulation
Ricketts V.T.O.
Image Comparison

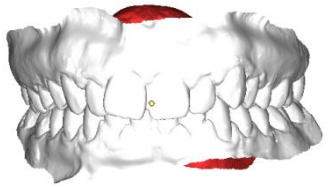
Add Image
Adjust Image
Digitize
Combine
Mirror
Treatment Simulation 3D
Image Comparison
Cast Adjust
Segmentation
FA_Bonding
V.T.O.3D
Wire Bonding
Kylix 3D
Bonding Trays 3D
Splint 3D
Bracket Adapt
Aligner 3D
Retainer 3D
Waefer Creation 3D

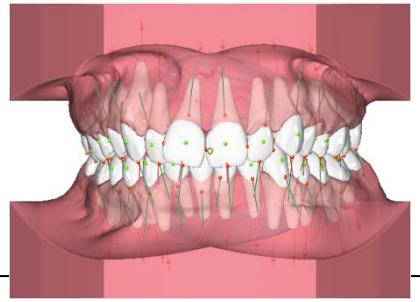
Preparation

Planning

Transfer

Preparation





Add Image
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Treatment Simulation 3D
Image Comparison
Cast Adjust
Segmentation
FA_Bonding
V.T.O.3D
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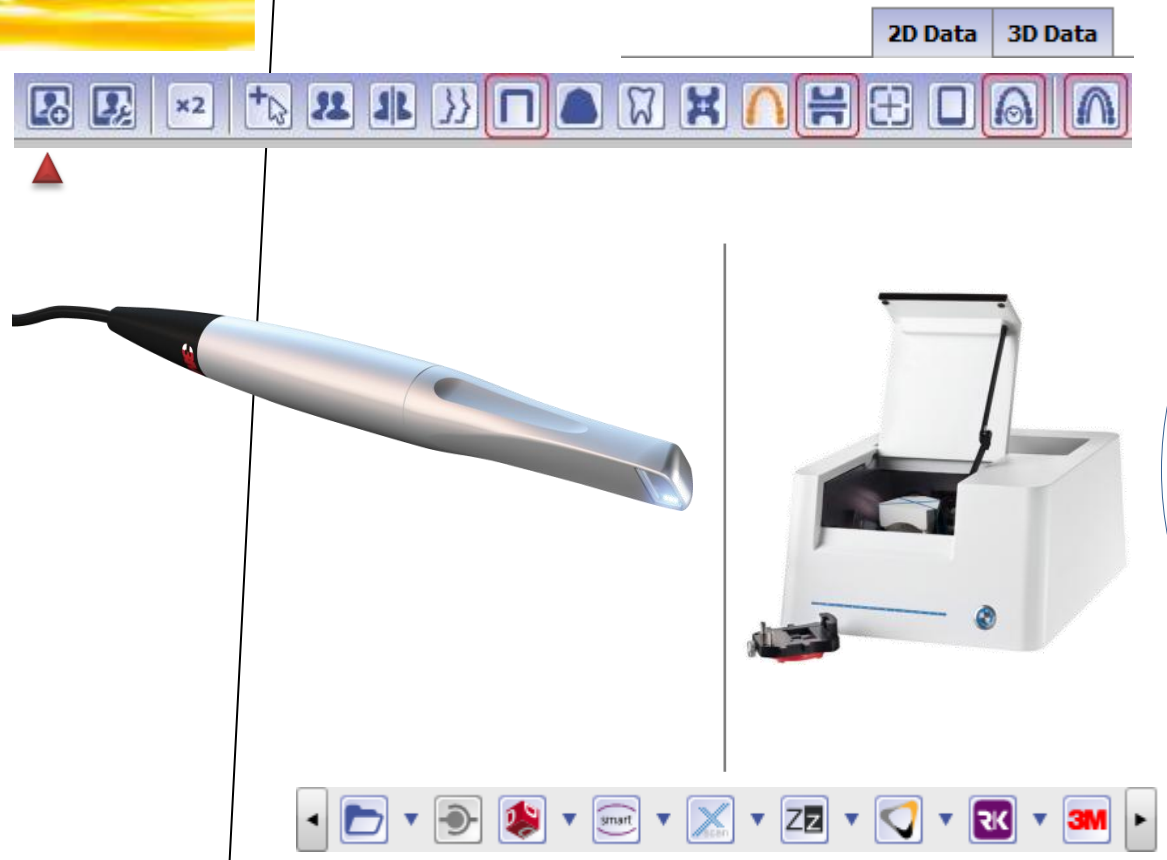
Kylix 3D
Bonding Trays 3D
Splint 3D
Bracket Adapt
Aligner 3D
Retainer 3D
Waefer Creation 3D

Preparation

Preparation: Add/Adjust Image

Preparation



Add Image
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Treatment Simulation 3D
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FA_Bonding
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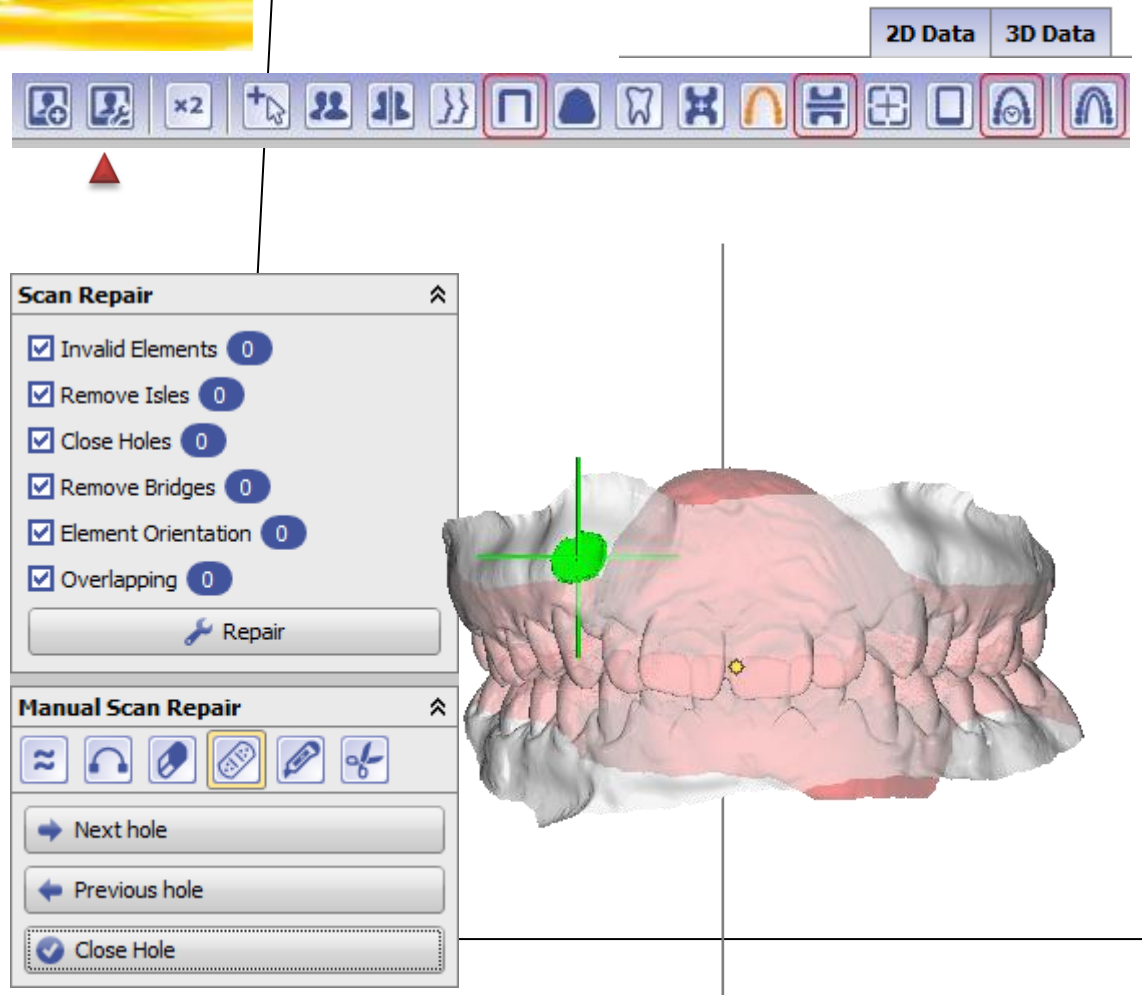
Bonding Trays 3D
Splint 3D
Bracket Adapt
Aligner 3D
Retainer 3D
Waefer Creation 3D

Preparation

Preparation: Add/Adjust Image

Preparation



Add Image
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Treatment Simulation 3D
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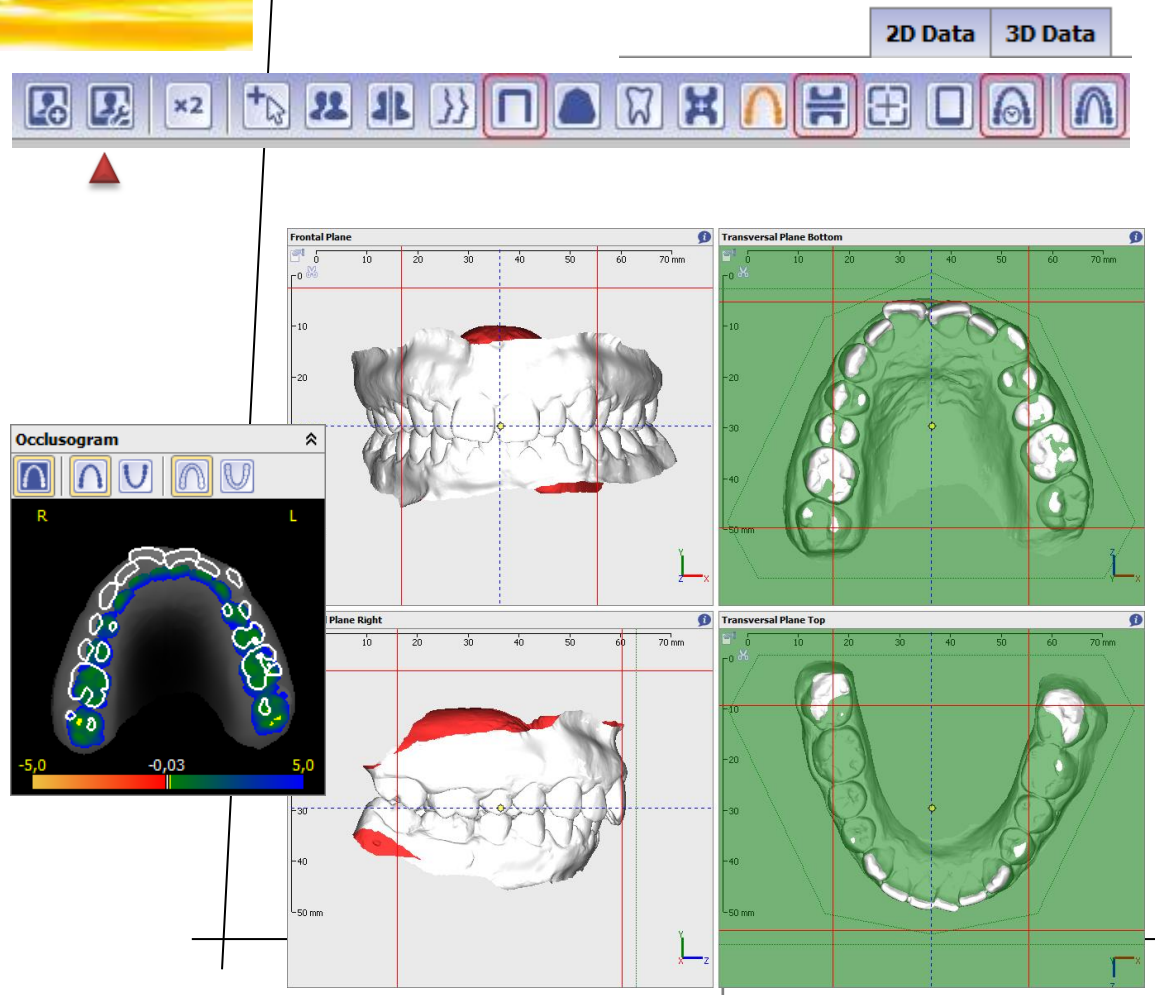
Kylix 3D
Bonding Trays 3D
Splint 3D
Bracket Adapt
Aligner 3D
Retainer 3D
Waefer Creation 3D

Preparation

Preparation: Modules Add/Adjust Image – Inspection

Preparation

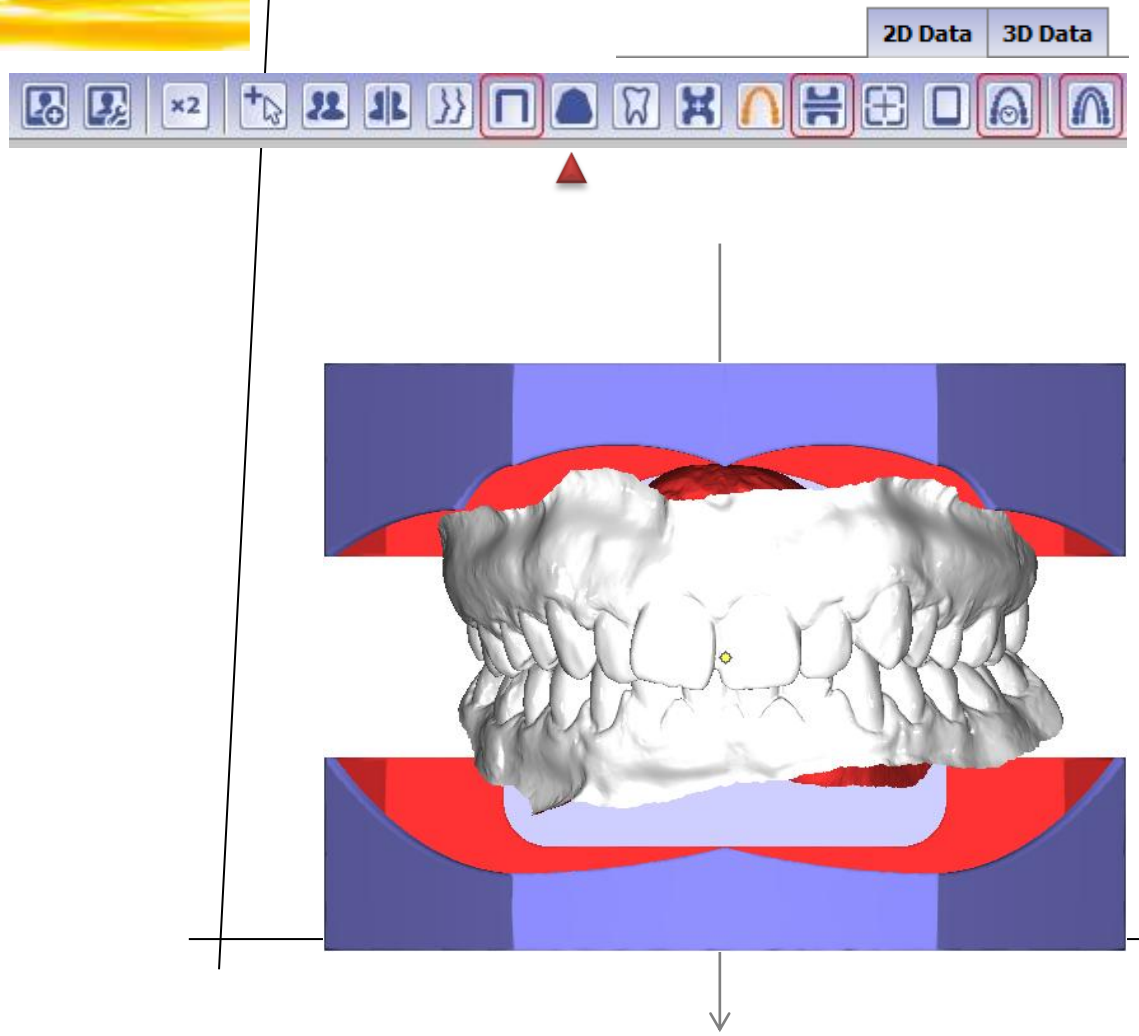


- Add Image
- **Adjust Image**
- Digitize
- Combine
- Mirror
- Treatment Simulation 3D
- Image Comparison
- Cast Adjust
- Segmentation
- FA_Bonding
- V.T.O.3D
- Wire Bonding
- Kylix 3D
- Bonding Trays 3D
- Splint 3D
- Bracket Adapt
- Aligner 3D
- Retainer 3D
- Waefer Creation 3D

Preparation

Preparation: Modules Add/Adjust Image – Alignment

Preparation



Add Image
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Image Comparison
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Segmentation
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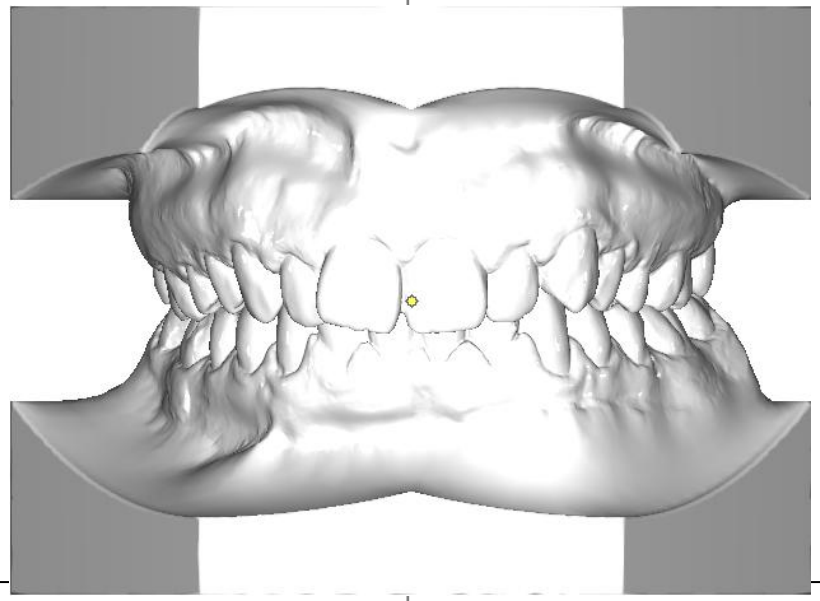
V.T.O.3D
Wire Bonding
Kylix 3D
Bonding Trays 3D
Splint 3D
Bracket Adapt
Aligner 3D
Retainer 3D
Waefer Creation 3D

Preparation

Preparation: Module Cast Adjust - Base Tray

Preparation



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Cast Adjust
Segmentation
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V.T.O.3D
Wire Bonding
Kylix 3D
Bonding Trays 3D
Splint 3D
Bracket Adapt
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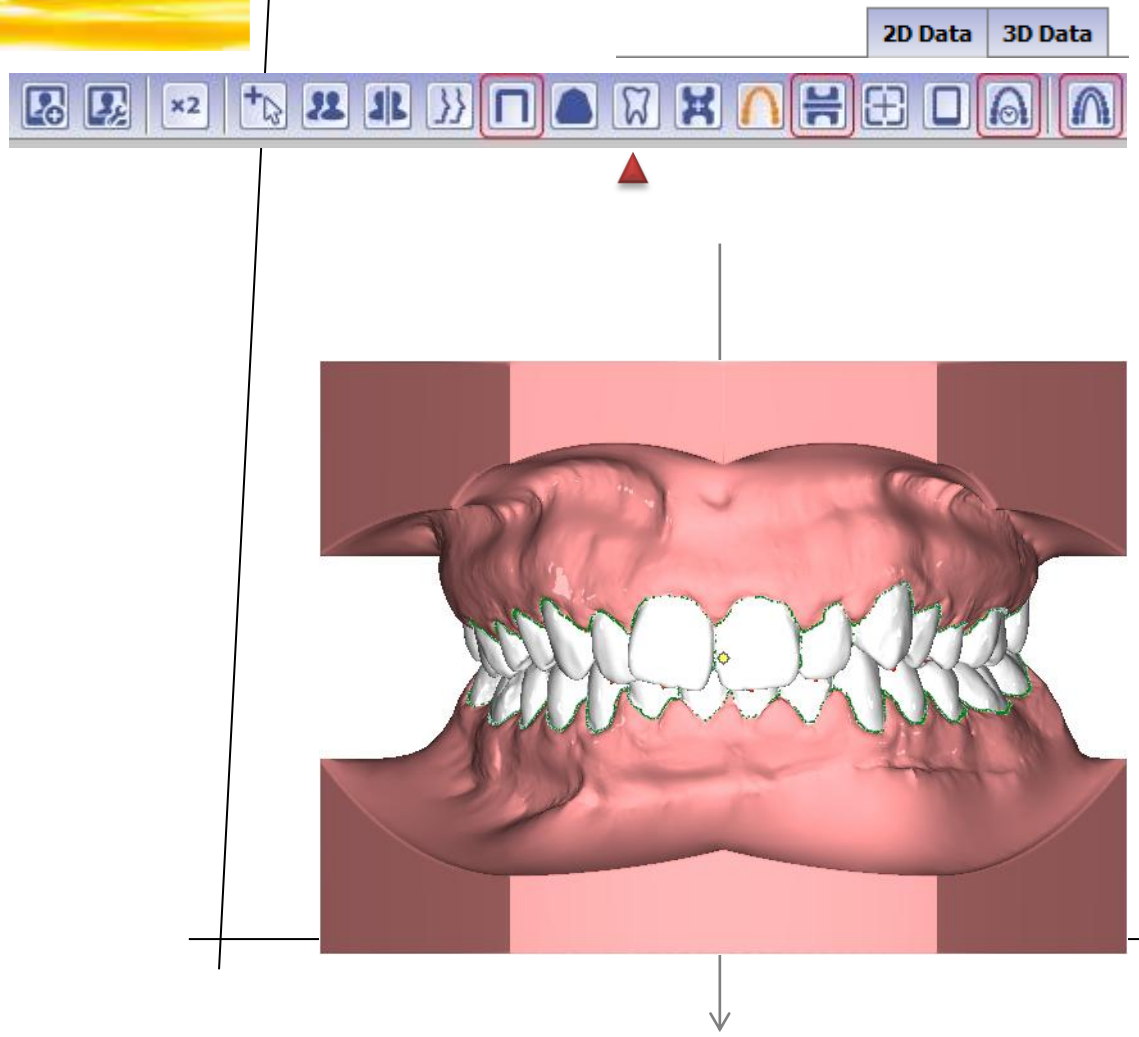
Retainer 3D
Waefer Creation 3D

Preparation

Preparation: Module Cast Adjust - Base Tray

Preparation



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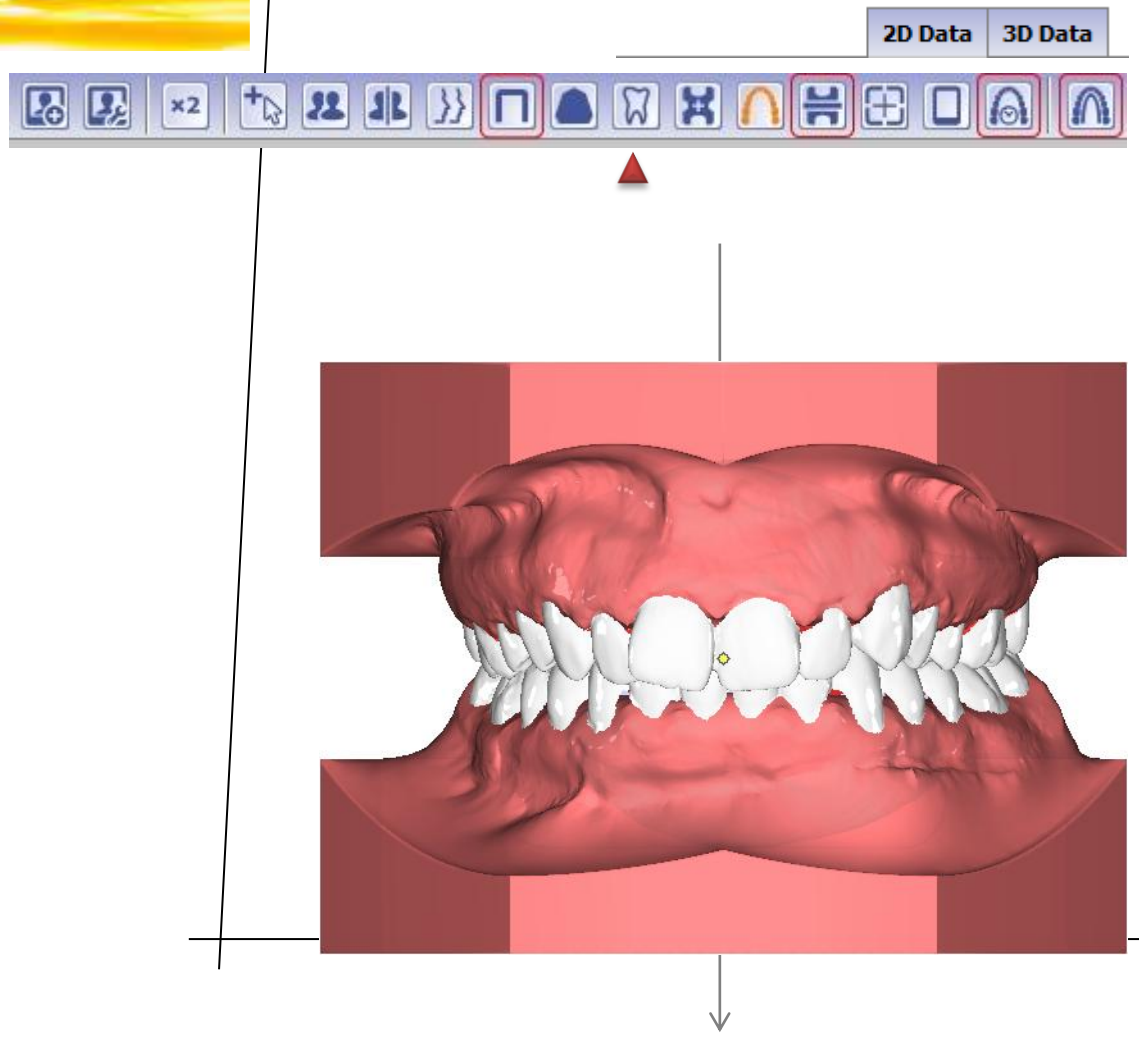
Splint 3D
Bracket Adapt
Aligner 3D
Retainer 3D
Waefer Creation 3D

Preparation

Preparation: Module Segmentation – Crown Segmentation

Preparation



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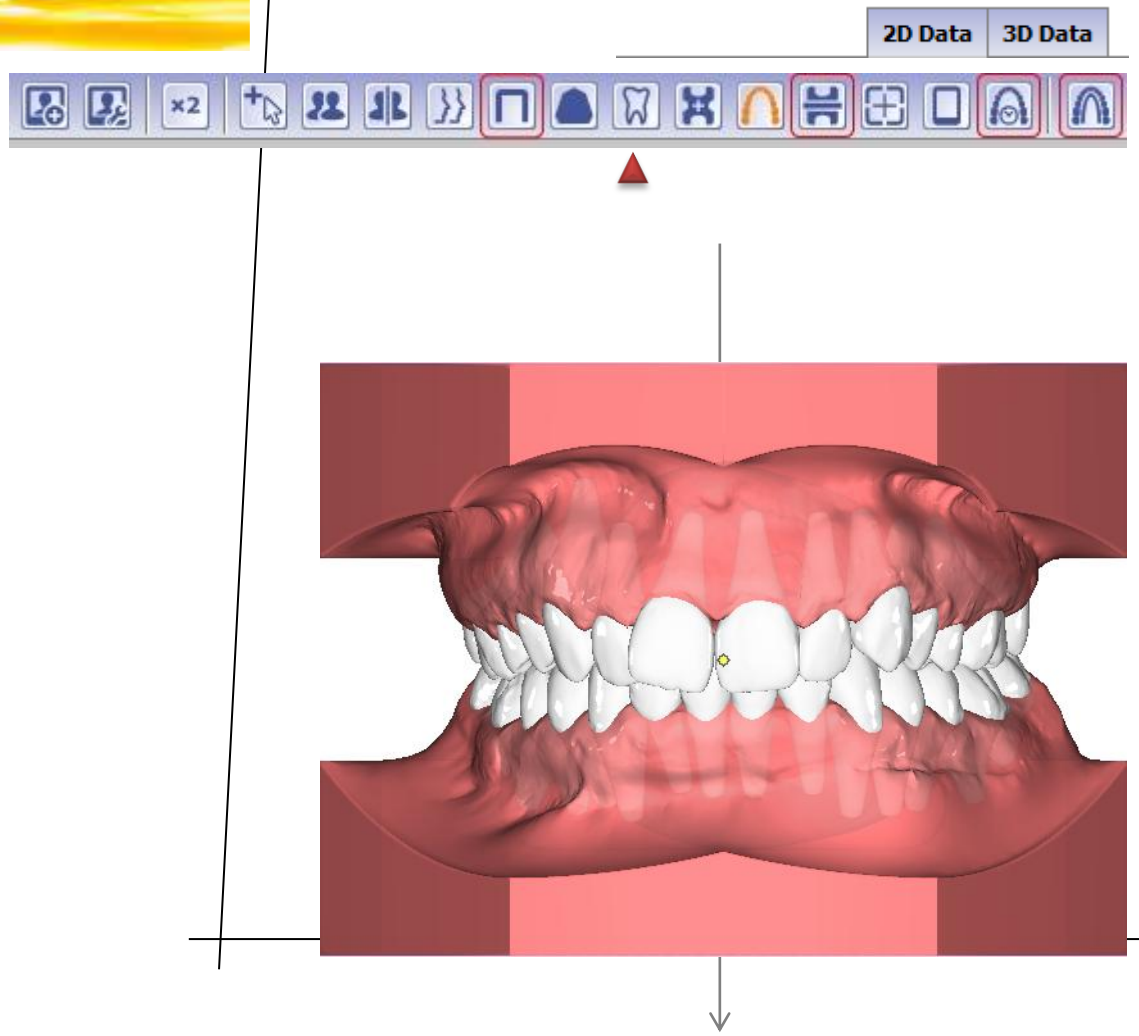
Bonding Trays 3D
Splint 3D
Bracket Adapt
Aligner 3D
Retainer 3D
Waefer Creation 3D

Preparation

Preparation: Module Segmentation - Separation

Preparation



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Segmentation
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V.T.O.3D
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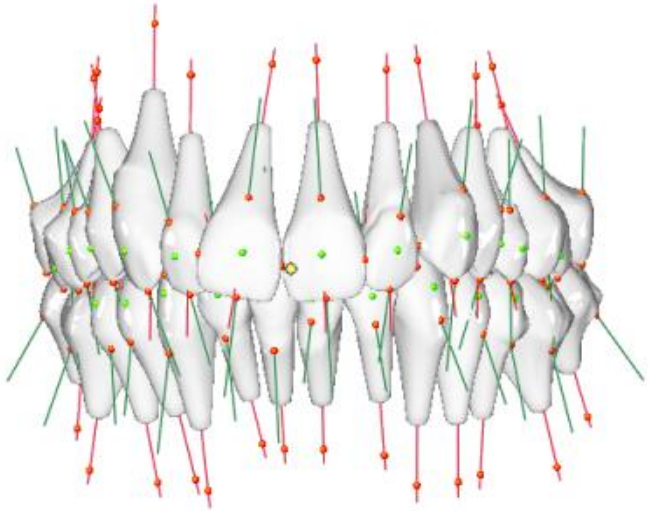
Splint 3D
Bracket Adapt
Aligner 3D
Retainer 3D
Waefer Creation 3D

Preparation

Preparation: Module Segmentation - Completion

Preparation

FA



- Add Image
- Adjust Image
- **Digitize**
- Combine
- Mirror
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- V.T.O.3D
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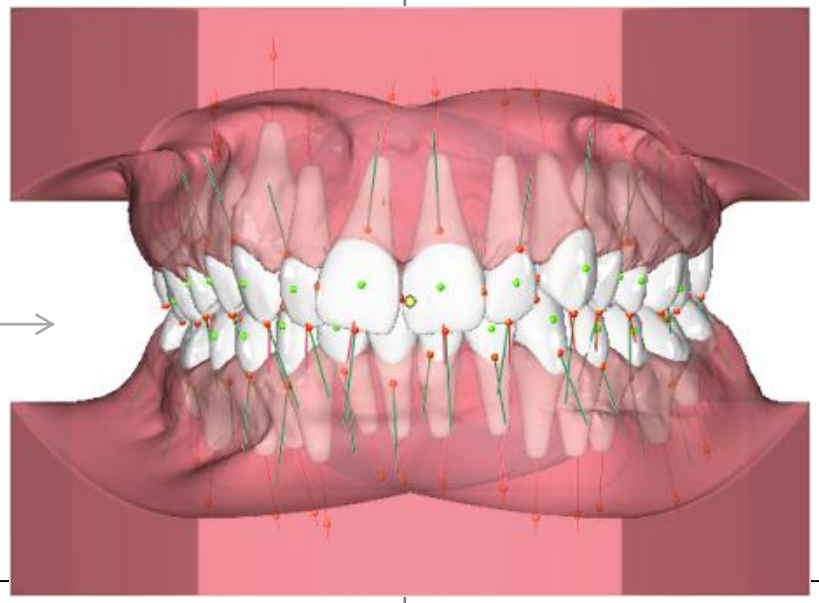
- Bracket Adapt
- Aligner 3D
- Retainer 3D
- Waefer Creation 3D

Preparation

Preparation: Module Digitize - Check/Correct Landmarks

Preparation

WALA



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- **Digitize**
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- Waefer Creation 3D

Preparation

Preparation: Module Digitize - Complete Landmarks

Preparation

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Splint 3D
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Waefer Creation 3D

Preparation

Digital i/d Bonding

Introduction
Overview OnyxCeph³™

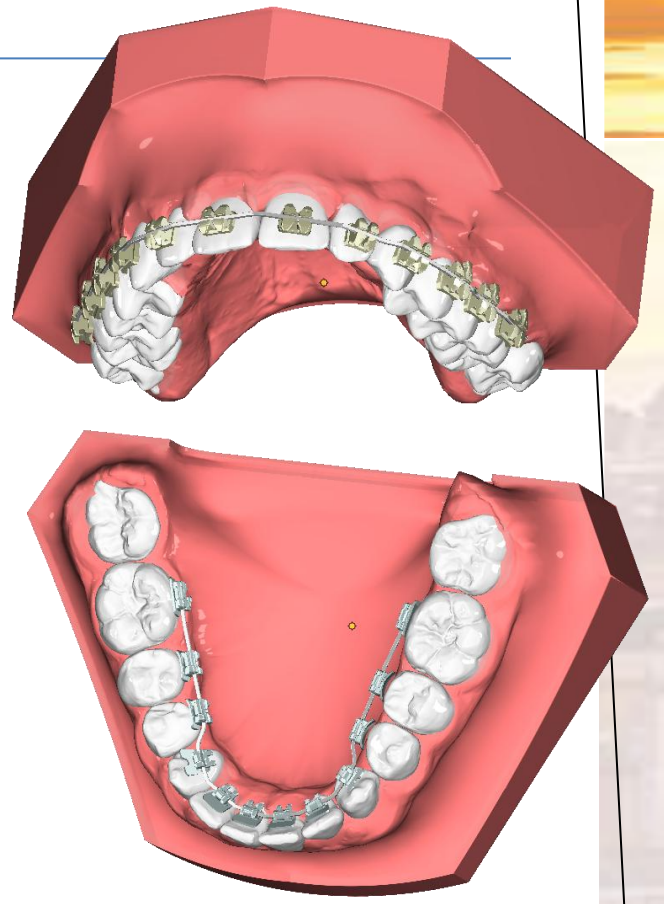
Workflow
- Preparation

FA_Bonding

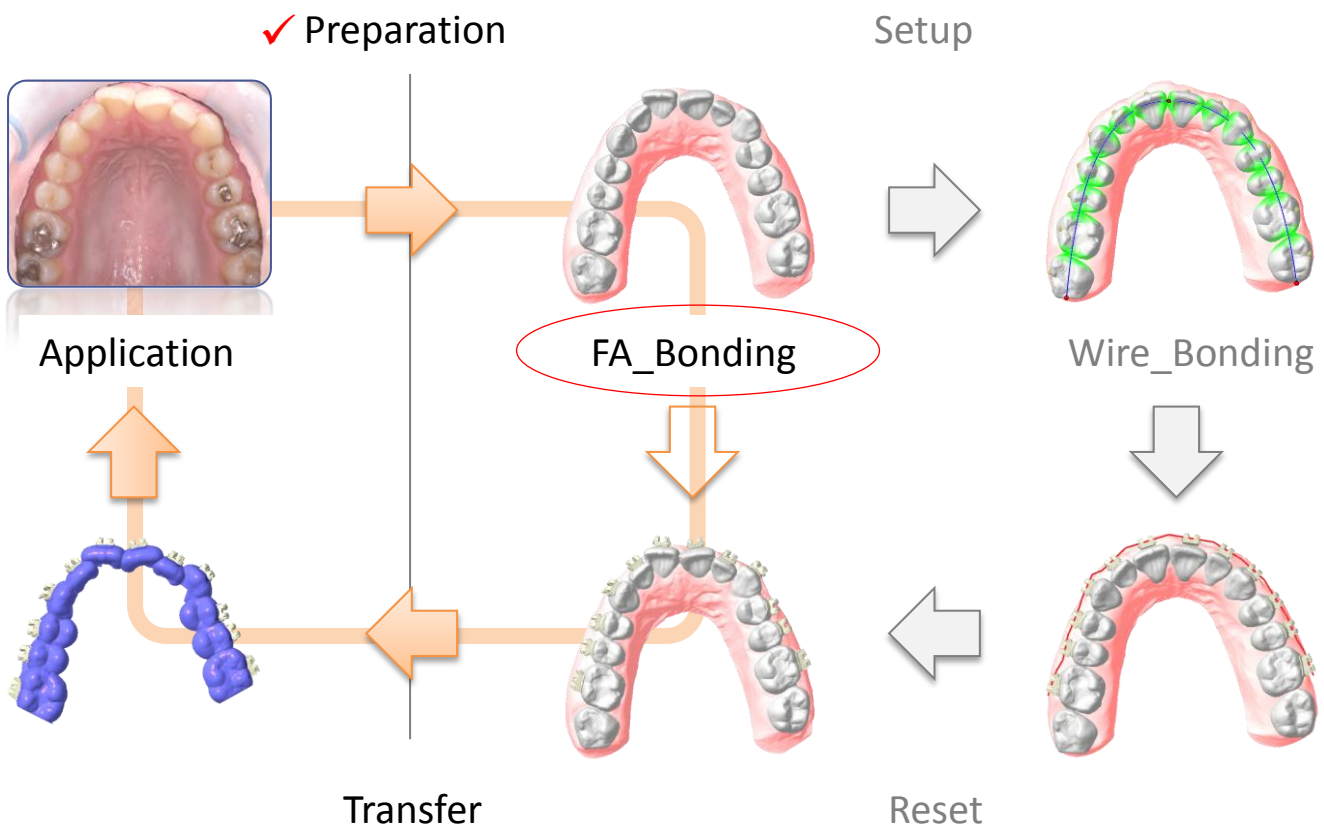
Wire_Bonding
- Virtual Setup
- Bracket-/Wire-Placement

Bracket Position Transfer
- Indirect Methods
- Direct/Mixed Methods

Other Planning Options (Overview)
Summary



FA_Bonding


✓ Preparation
Setup
Application
FA_Bonding
Wire_Bonding
Transfer
Reset

FA_Bonding

- Add Image
- Adjust Image
- Digitize
- Combine
- Mirror
- Treatment Simulation 3D
- Image Comparison
- Cast Adjust
- Segmentation
- **FA_Bonding**
- V.T.O.3D
- Wire Bonding
- Kylix 3D
- Bonding Trays 3D
- Splint 3D
- Bracket Adapt
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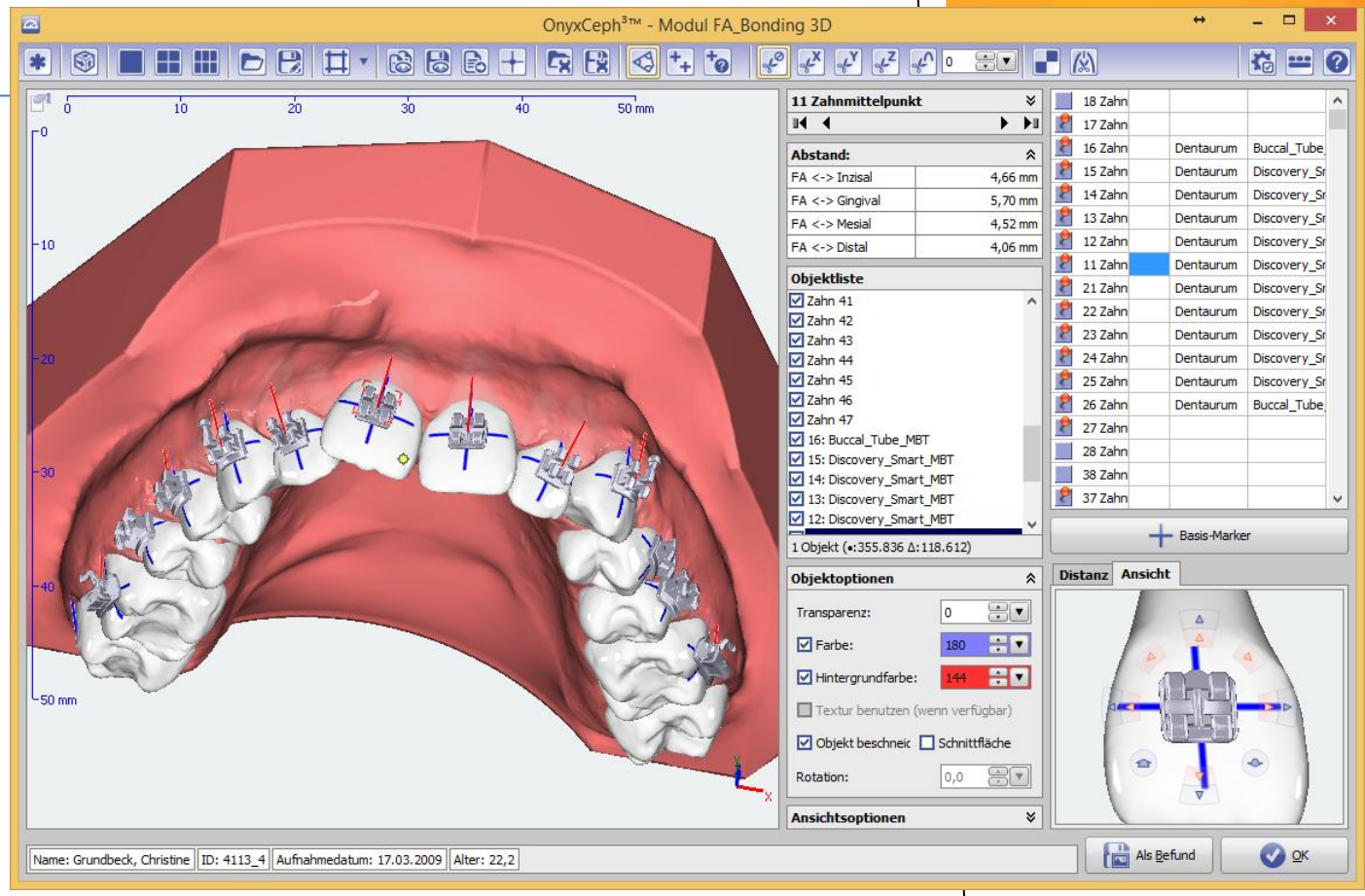
- Retainer 3D
- Waefer Creation 3D



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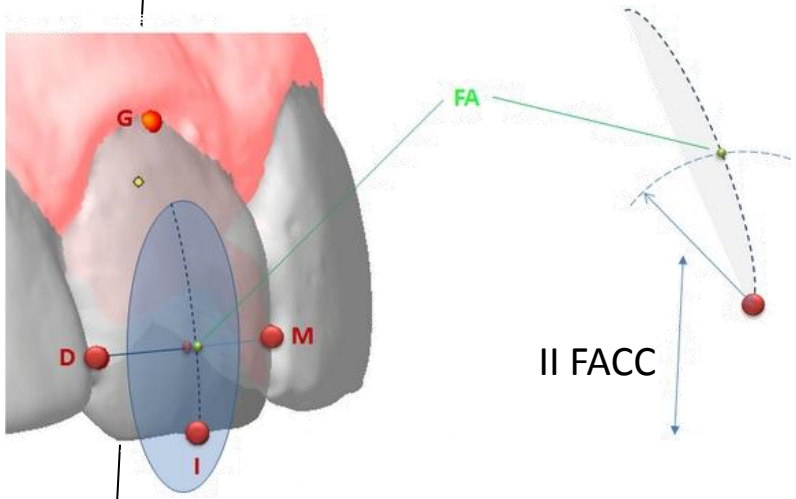

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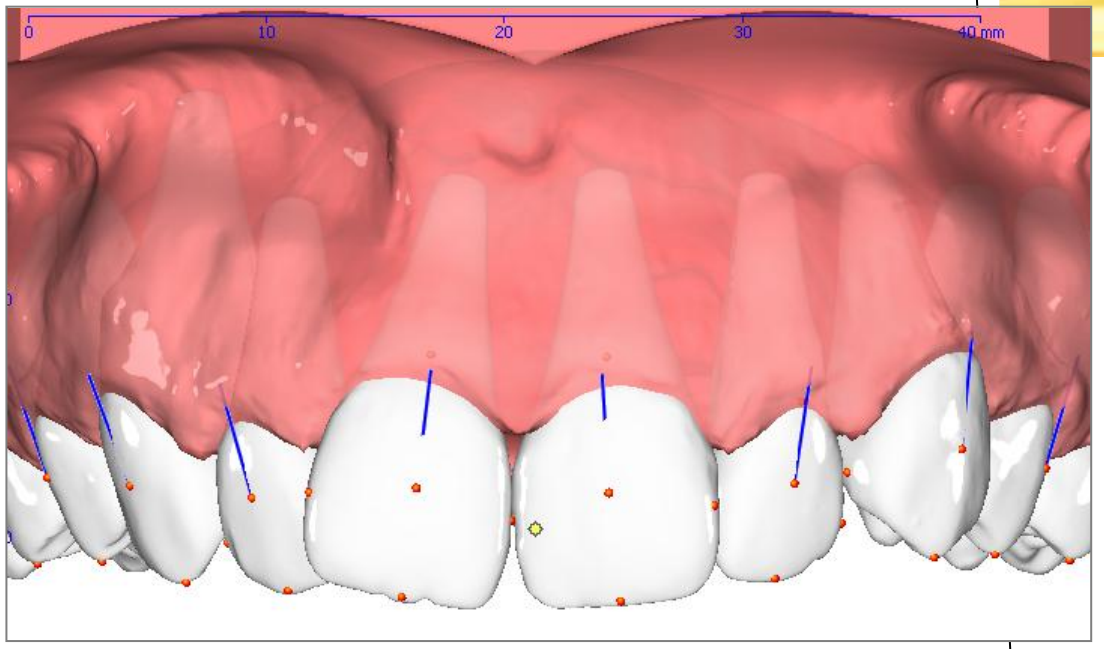
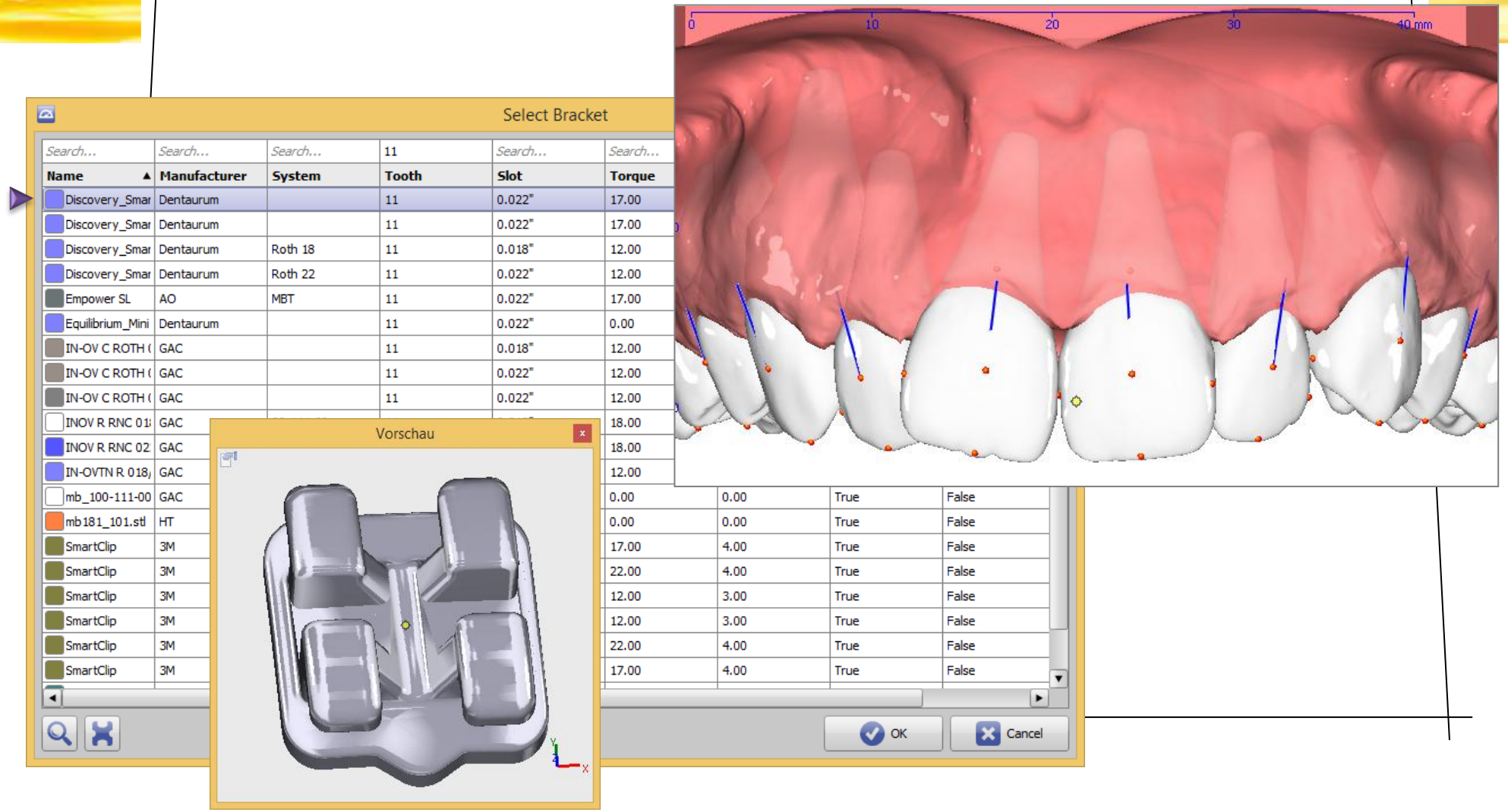


MBT/Andrews

+ Correction ~ Crown Height
+ Correction ~ Overbite Type

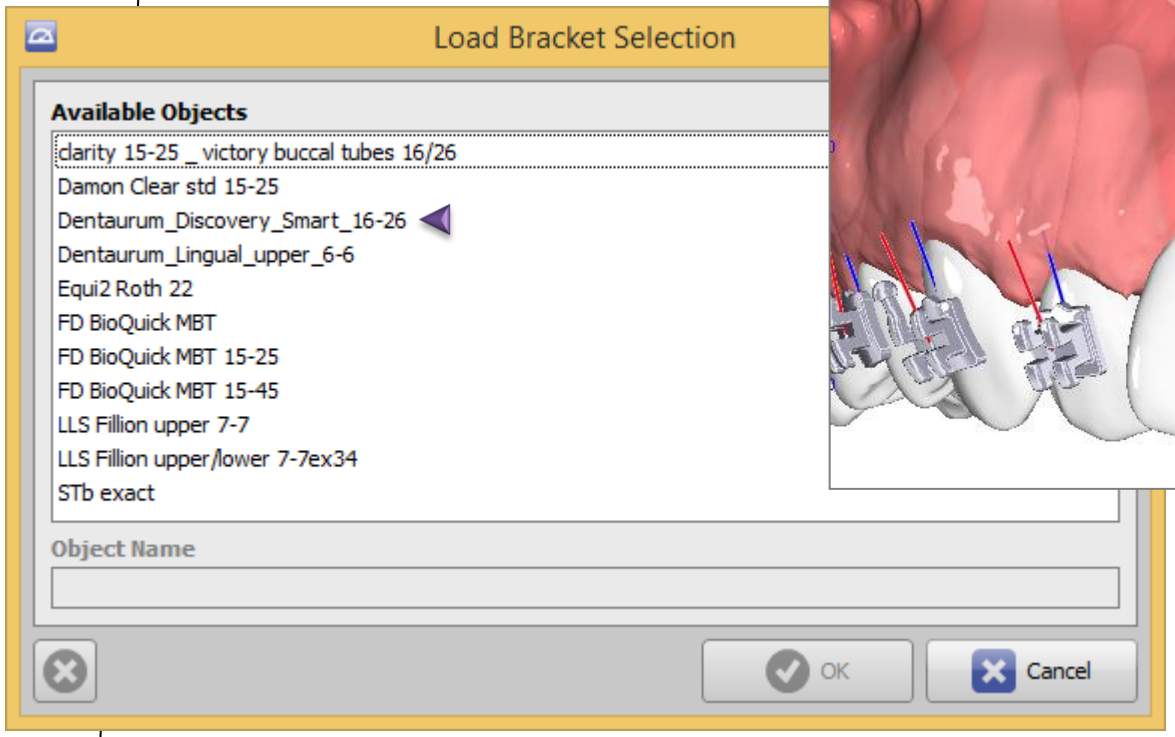
U7	U6	U5	U4	U3	U2	U1
2,0	3,0	4,0	4,5	5,0	4,5	5,0
L7	L6	L5	L4	L3	L2	L1
2,5	2,5	3,5	4,0	4,5	4,0	4,0

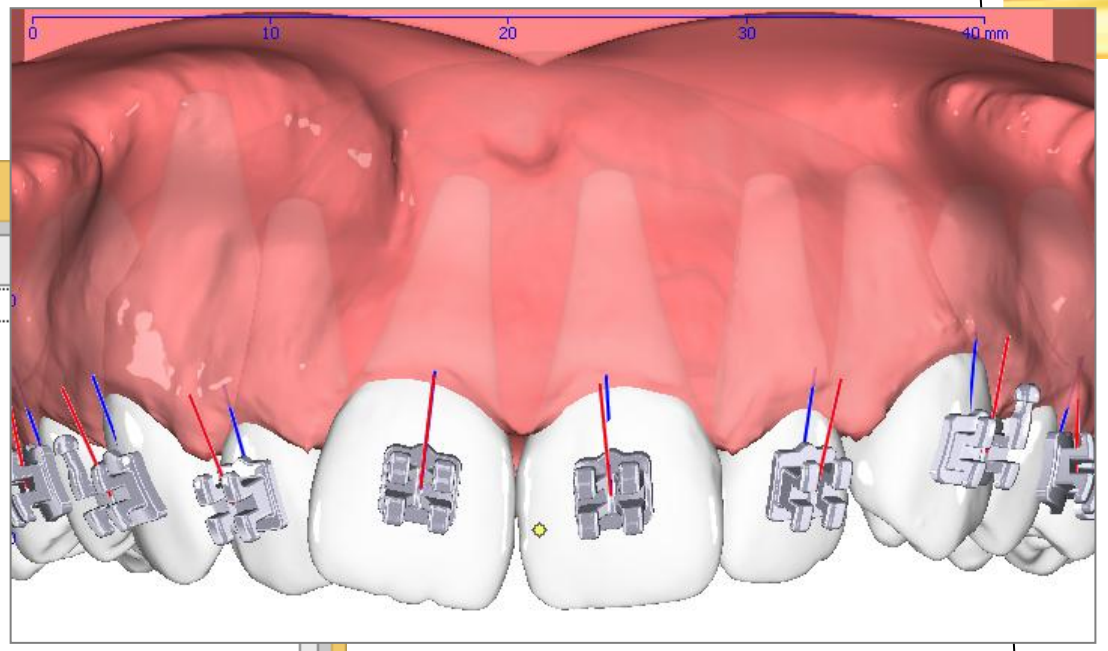
FA_Bonding



FA_Bonding: Bracket Library

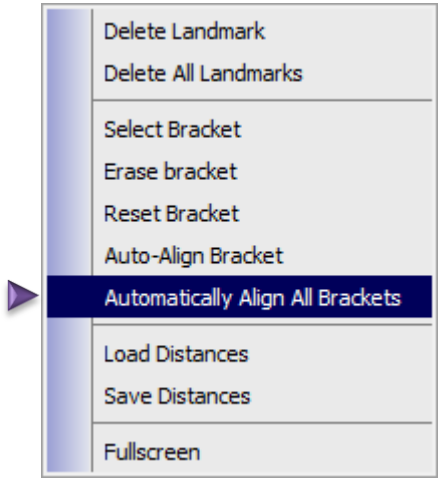
FA_Bonding

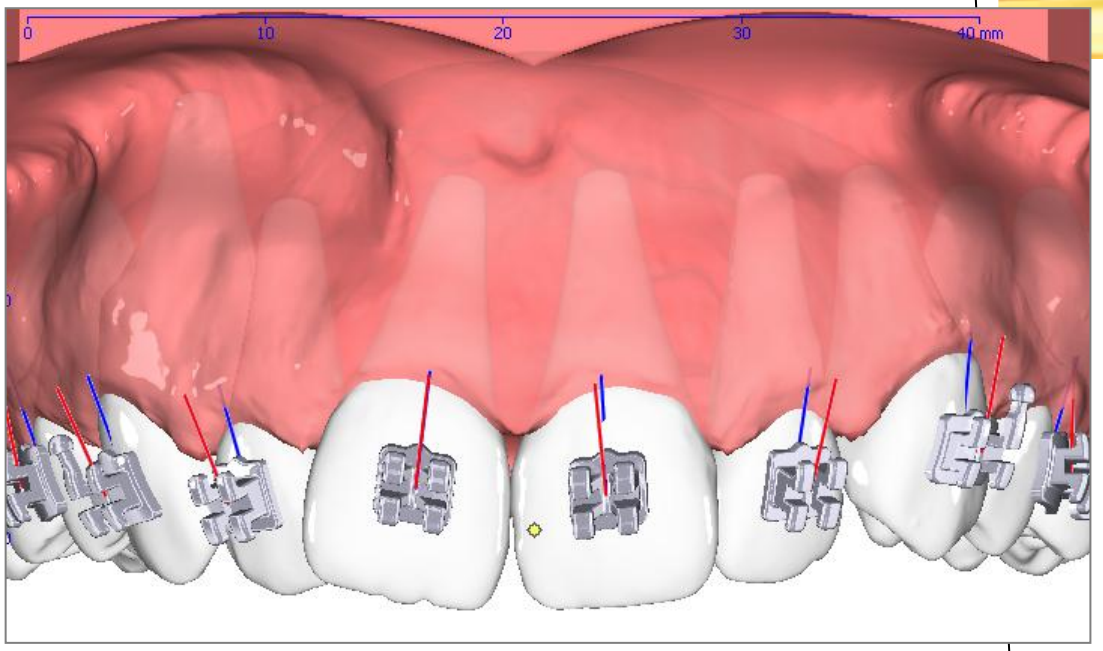




FA_Bonding: Bracket Groups

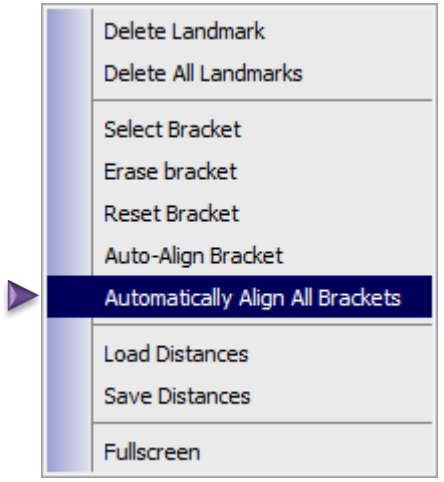
FA_Bonding

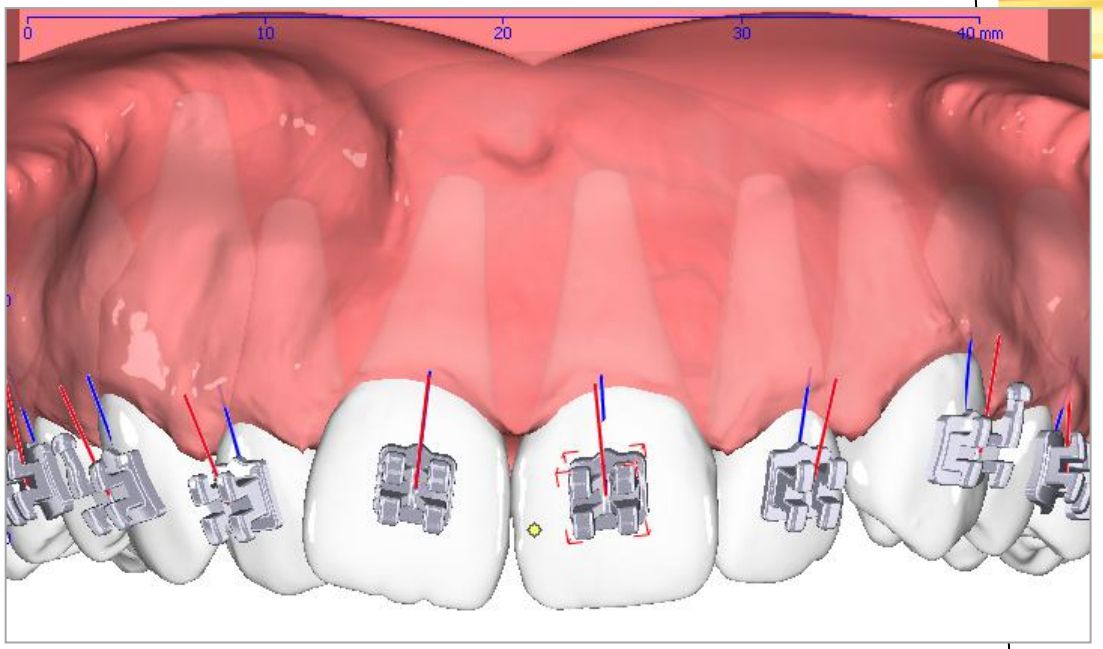




FA_Bonding: Auto Distance

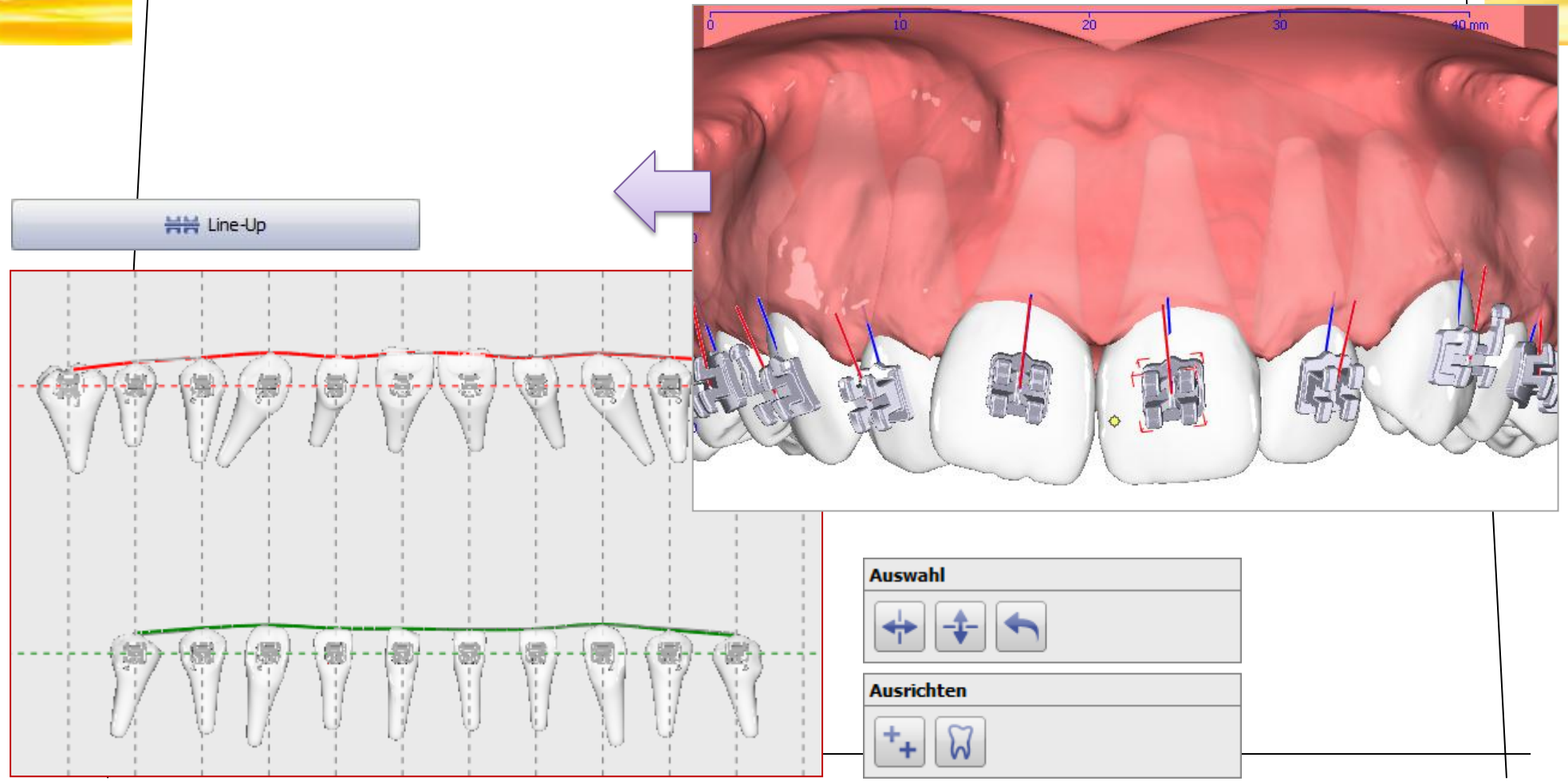
FA_Bonding





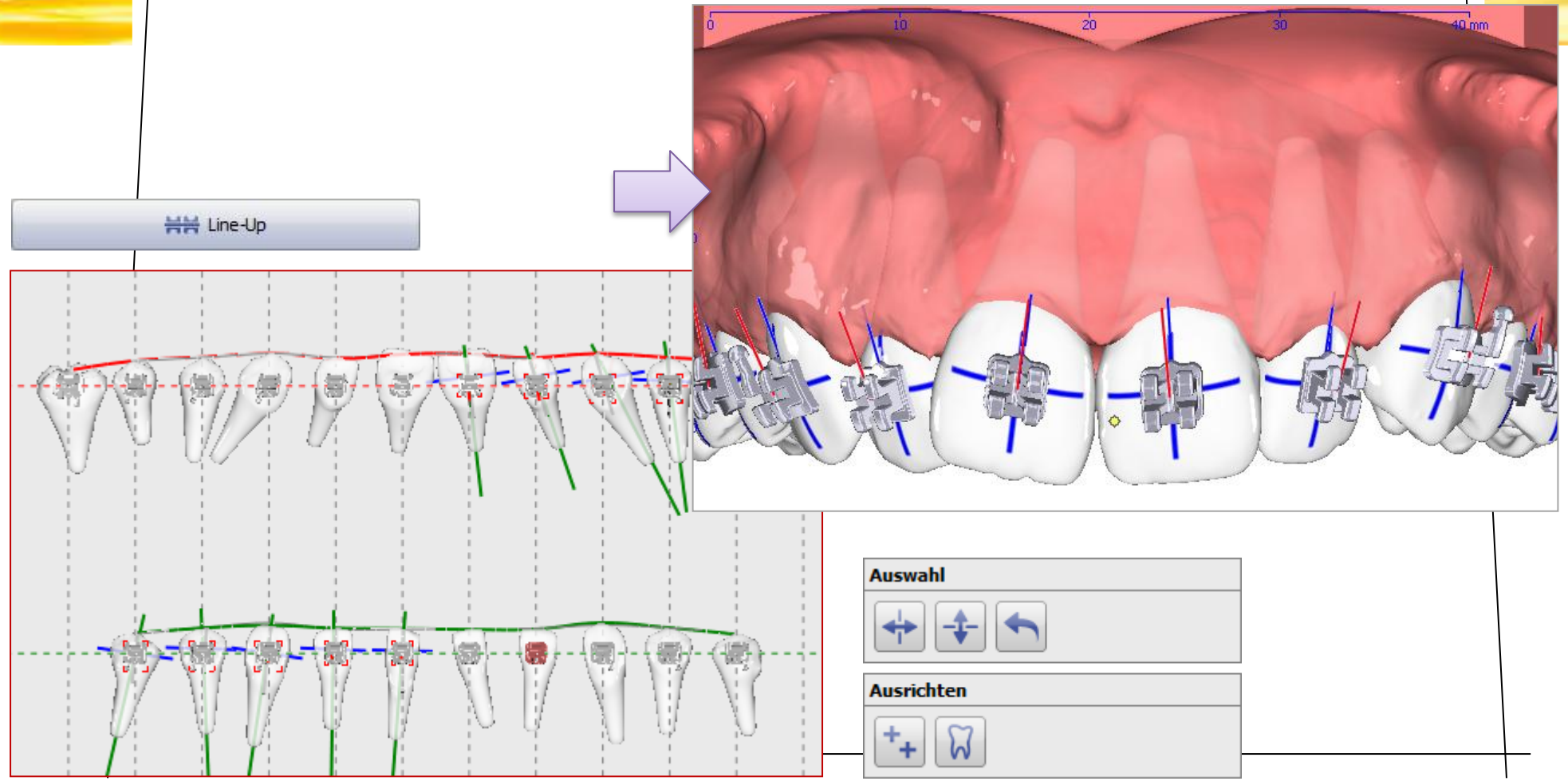
FA_Bonding: Auto Distance

FA_Bonding



FA_Bonding: Tooth/Arch/Crest Symmetry

FA_Bonding



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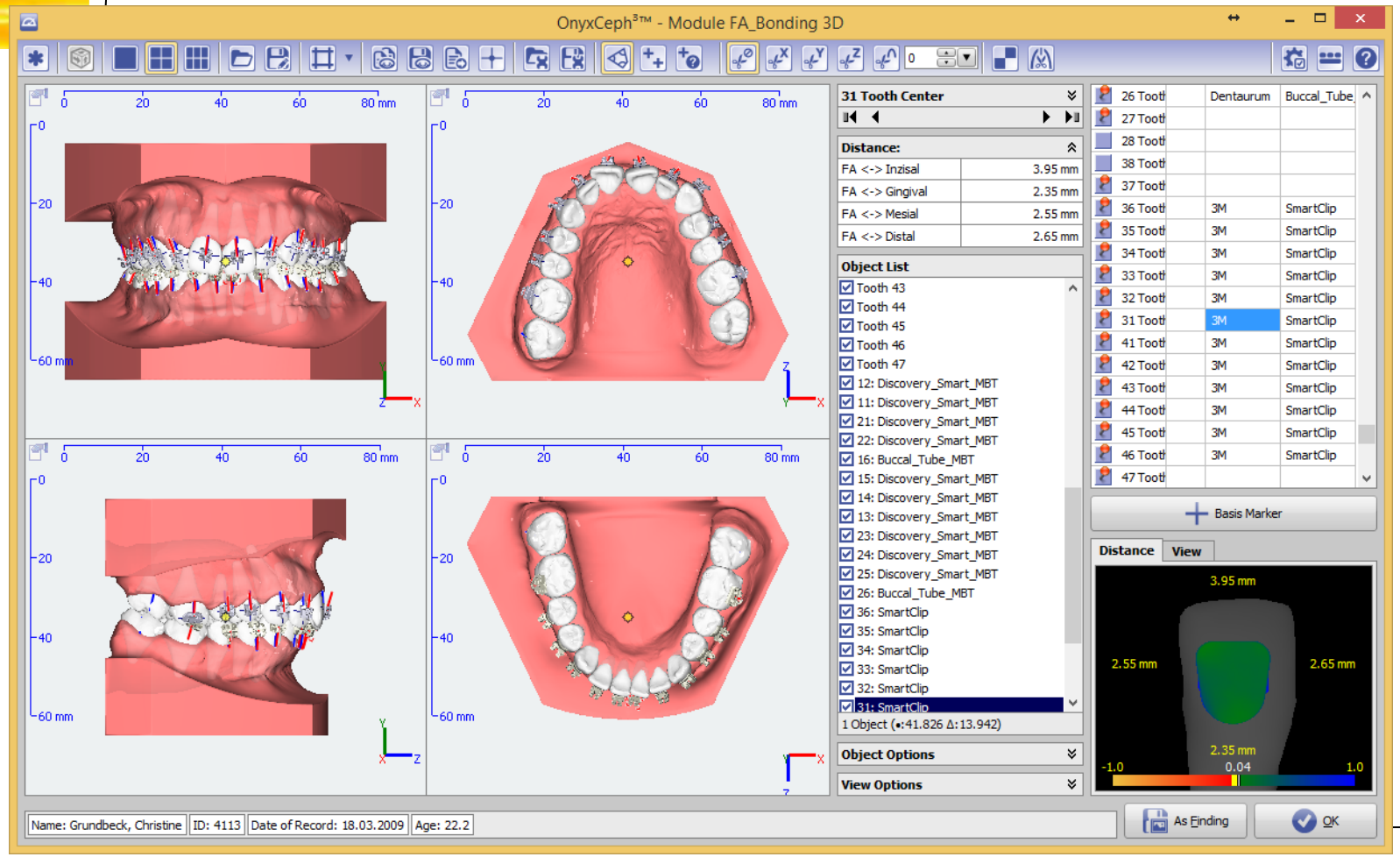
OnyxCeph³™ - Module FA_Bonding 3D
31 Tooth Center
Distance:
FA <-> Inzisal 3.95 mm
FA <-> Gingival 2.35 mm
FA <-> Mesial 2.55 mm
FA <-> Distal 2.65 mm
Object List
Tooth 43
Tooth 44
Tooth 45
Tooth 46
Tooth 47
12: Discovery_Smart_MBT
11: Discovery_Smart_MBT
21: Discovery_Smart_MBT
22: Discovery_Smart_MBT
16: Buccal_Tube_MBT
15: Discovery_Smart_MBT
14: Discovery_Smart_MBT
13: Discovery_Smart_MBT
23: Discovery_Smart_MBT
24: Discovery_Smart_MBT
25: Discovery_Smart_MBT
26: Buccal_Tube_MBT
36: SmartClip
35: SmartClip
34: SmartClip
33: SmartClip
32: SmartClip
31: SmartClip
1 Object (•:41.826 Δ:13.942)
Object Options
View Options
Basis Marker
Distance
View
3.95 mm
2.55 mm
2.65 mm
2.35 mm
-1.0
0.04
1.0
Name: Grundbeck, Christine
ID: 4113
Date of Record: 18.03.2009
Age: 22.2
As Finding
OK

FA_Bonding

Add Image
Adjust Image
Digitize
Combine
Mirror
Treatment Simulation 3D
Image Comparison
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Segmentation
FA_Bonding
V.T.O.3D
Wire Bonding
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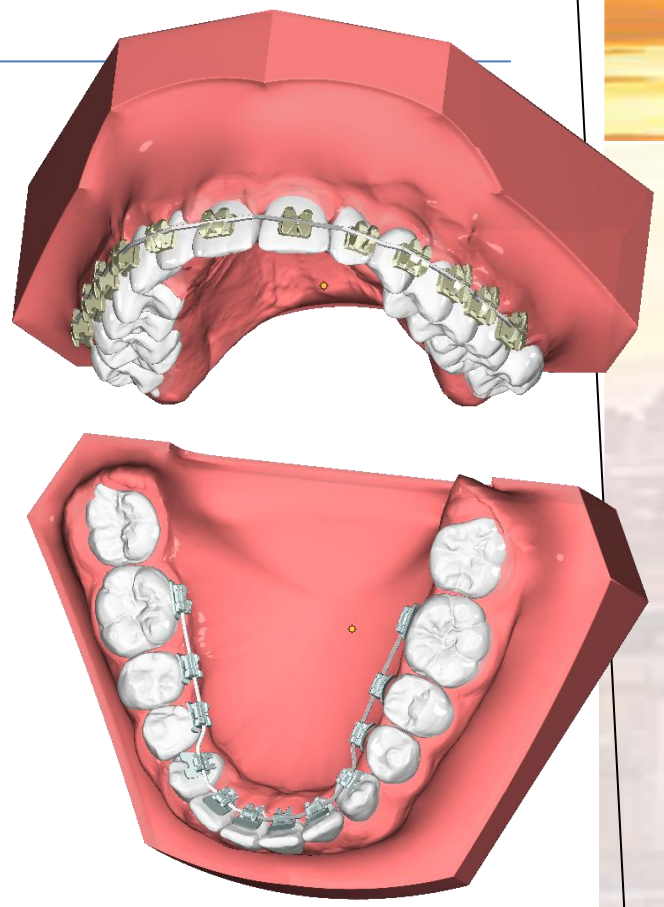
Splint 3D
Bracket Adapt
Aligner 3D
Retainer 3D
Waefer Creation 3D

FA_Bonding: Example

Digital i/d Bonding



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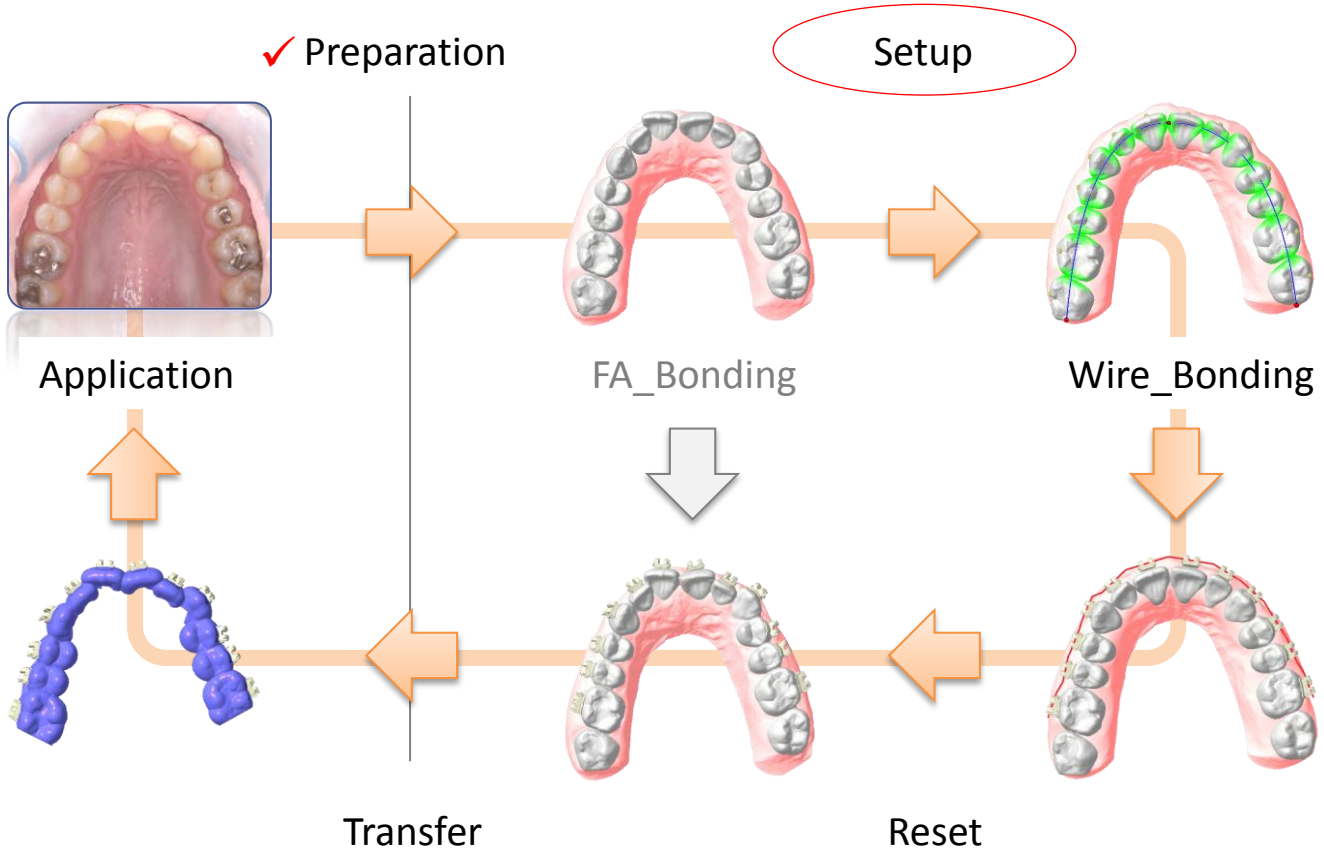

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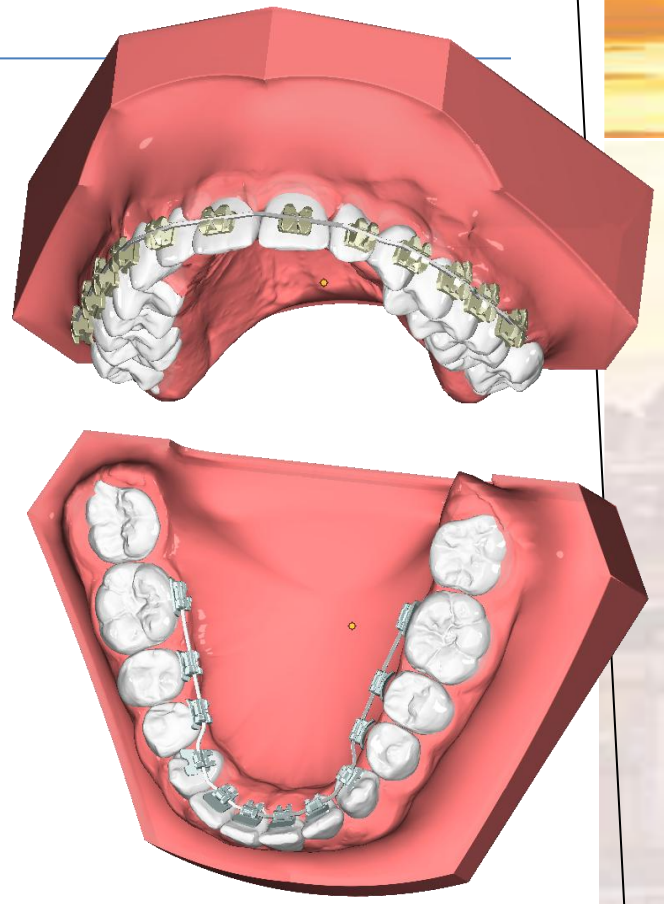

Virtual Setup

- Add Image
- Adjust Image
- Digitize
- Combine
- Mirror
- Treatment Simulation 3D
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- Cast Adjust
- Segmentation
- FA_Bonding
- **V.T.O.3D**
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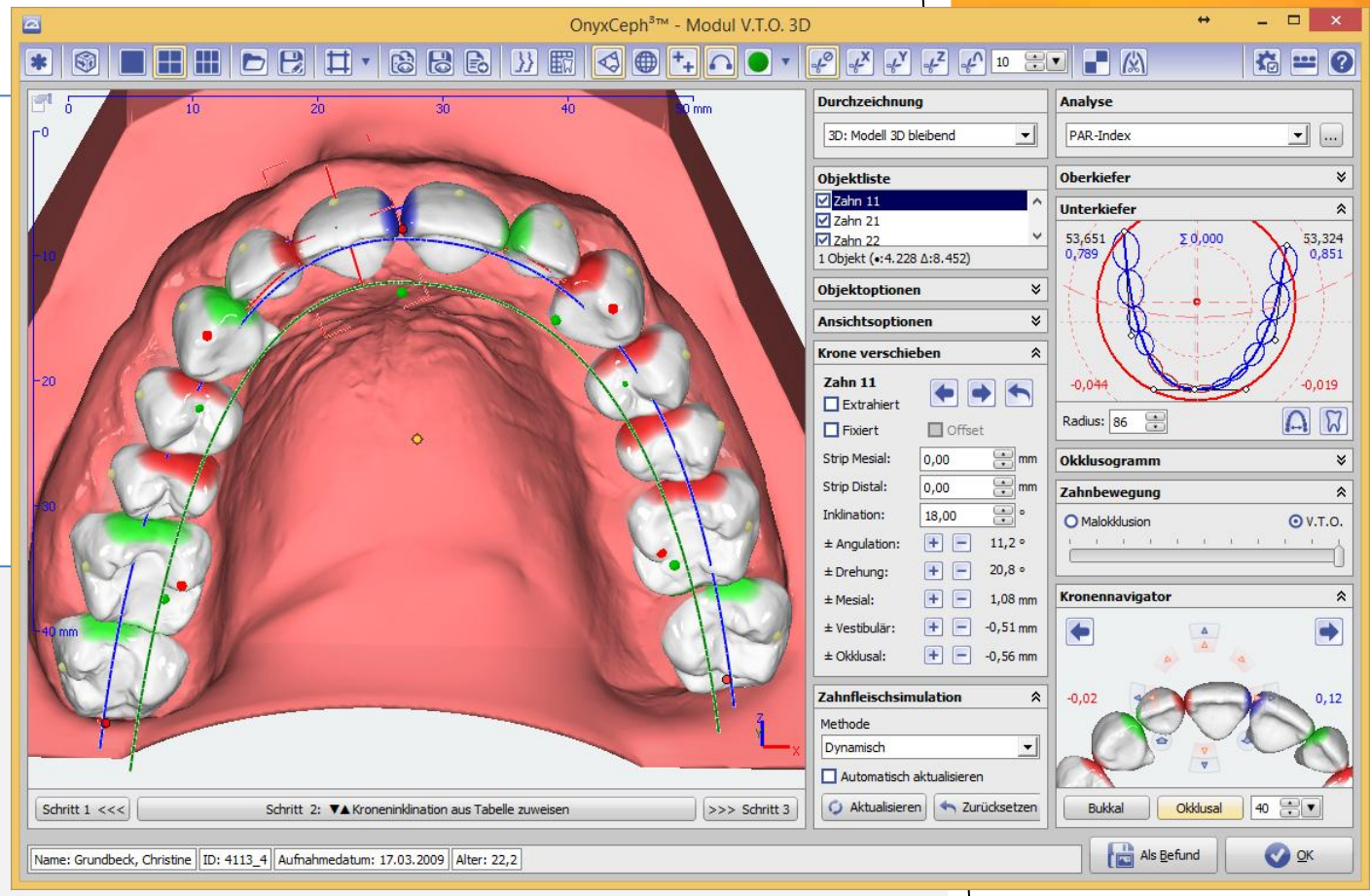
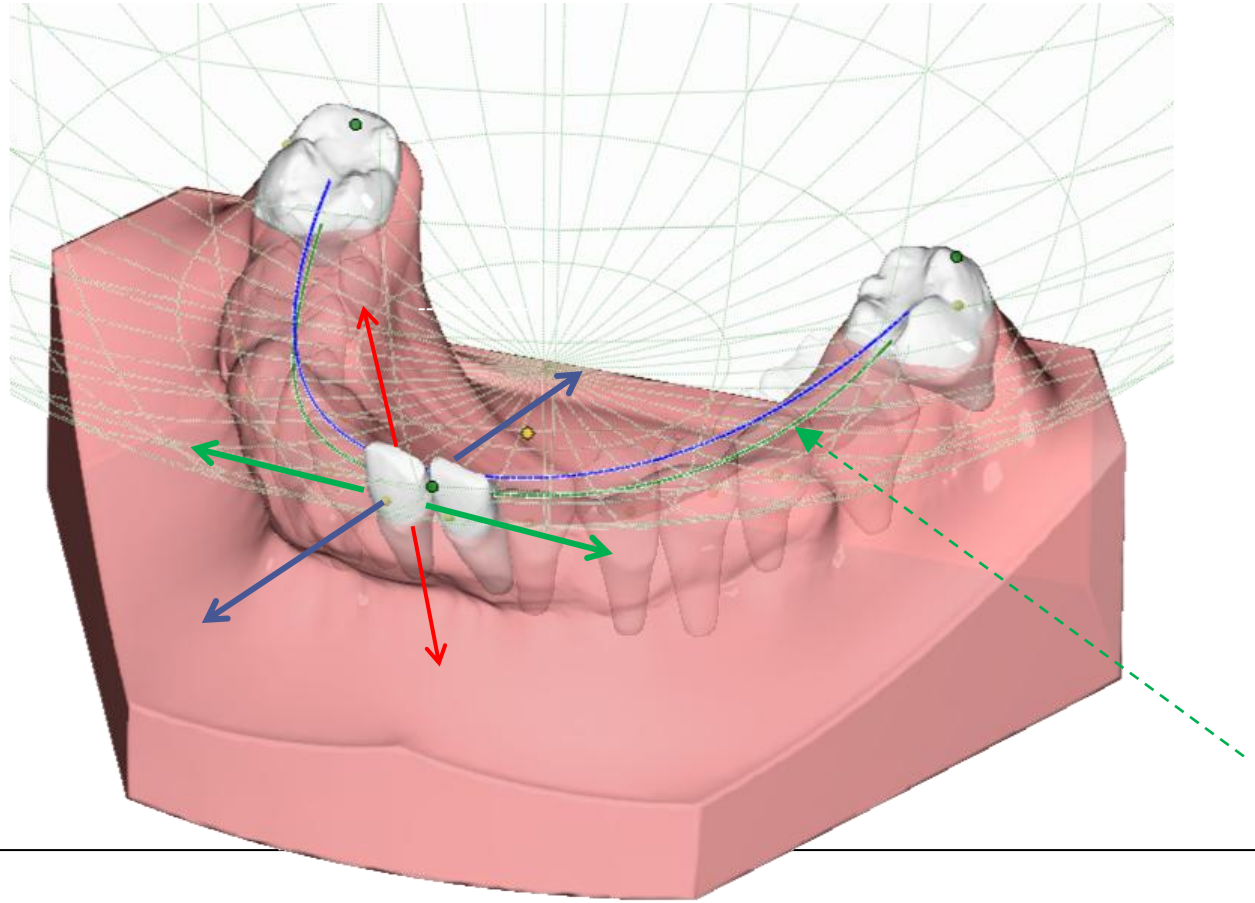
- Bonding Trays 3D
- Splint 3D
- Bracket Adapt
- Aligner 3D
- Retainer 3D
- Waefer Creation 3D



OnyxCeph³™

Virtual Setup



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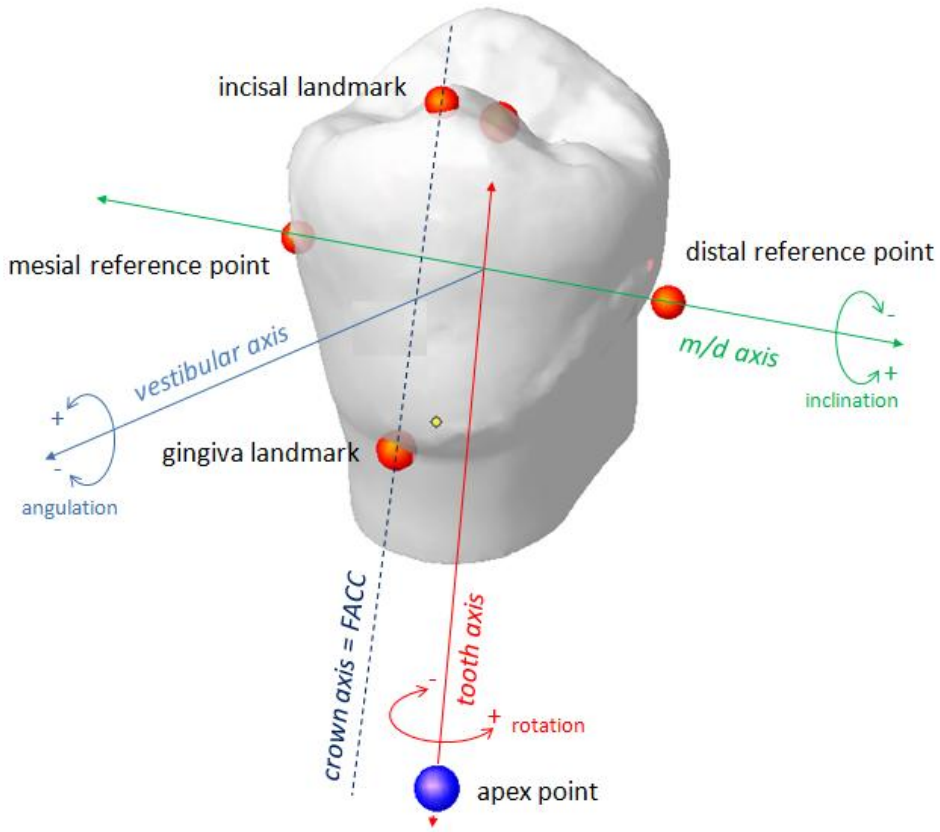

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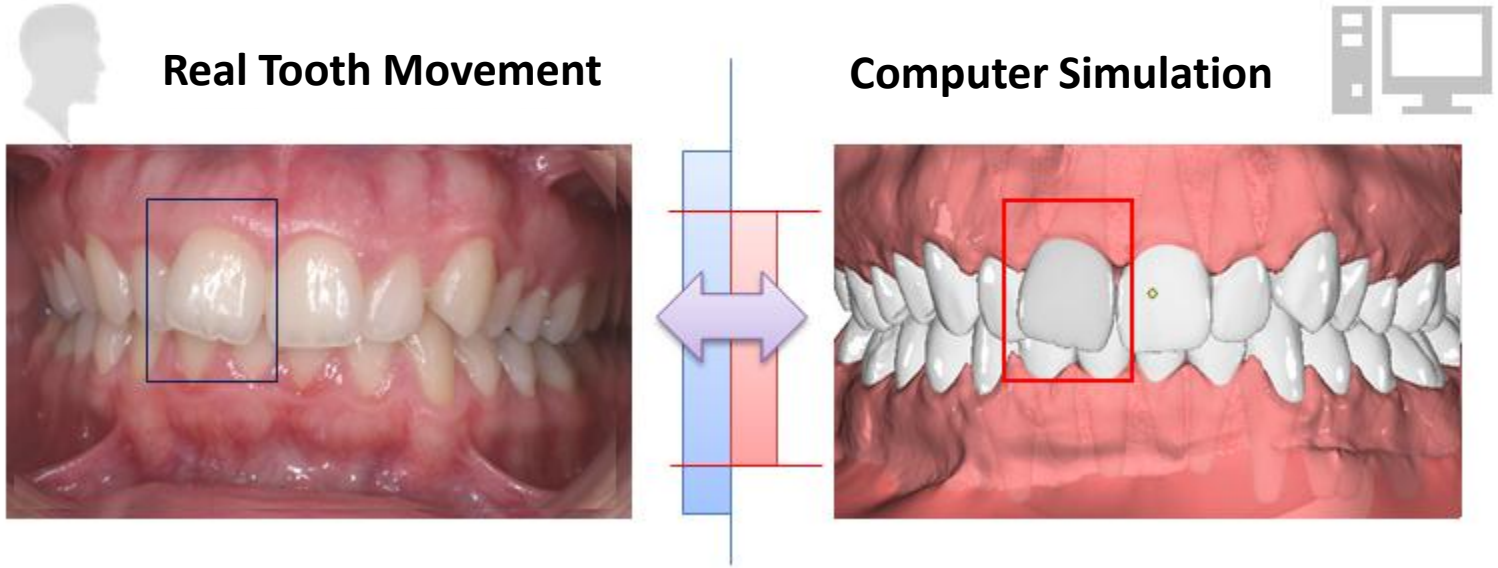

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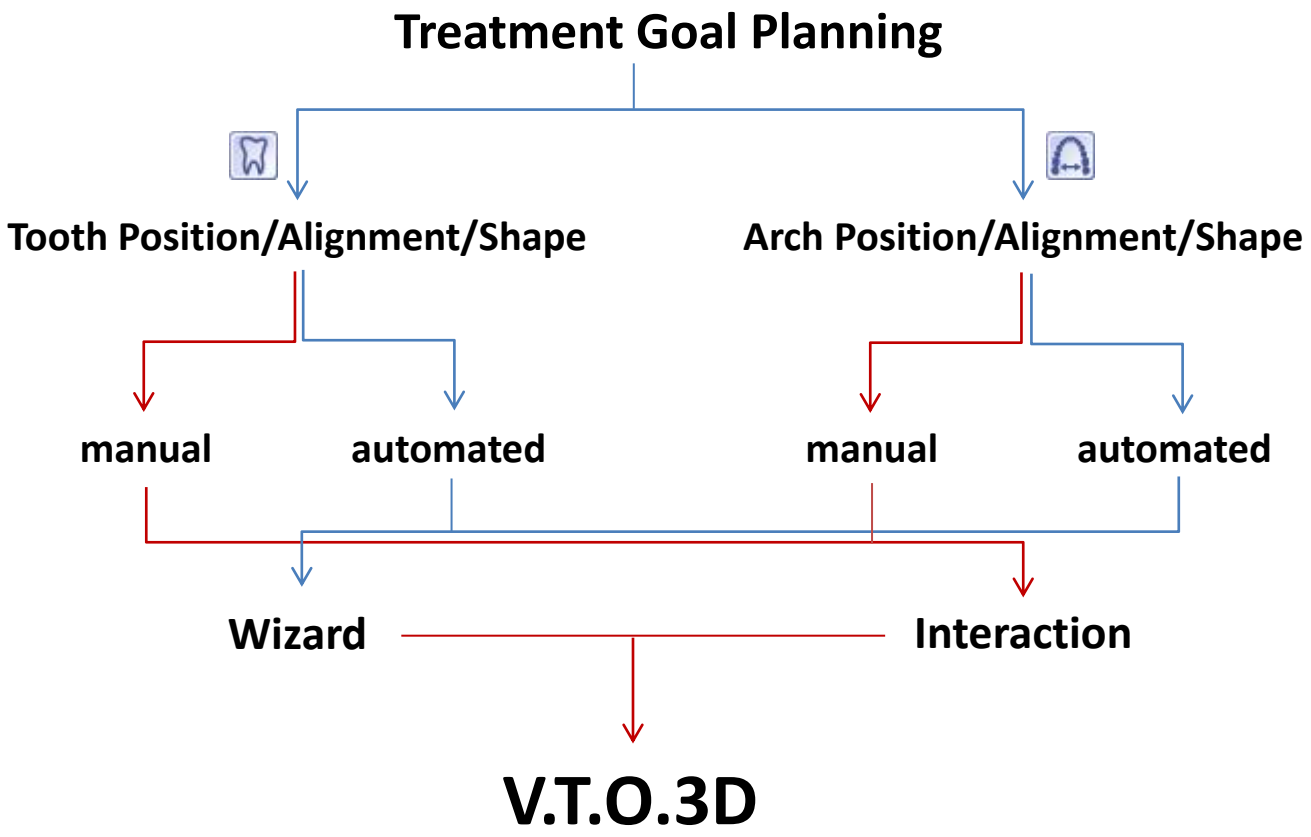

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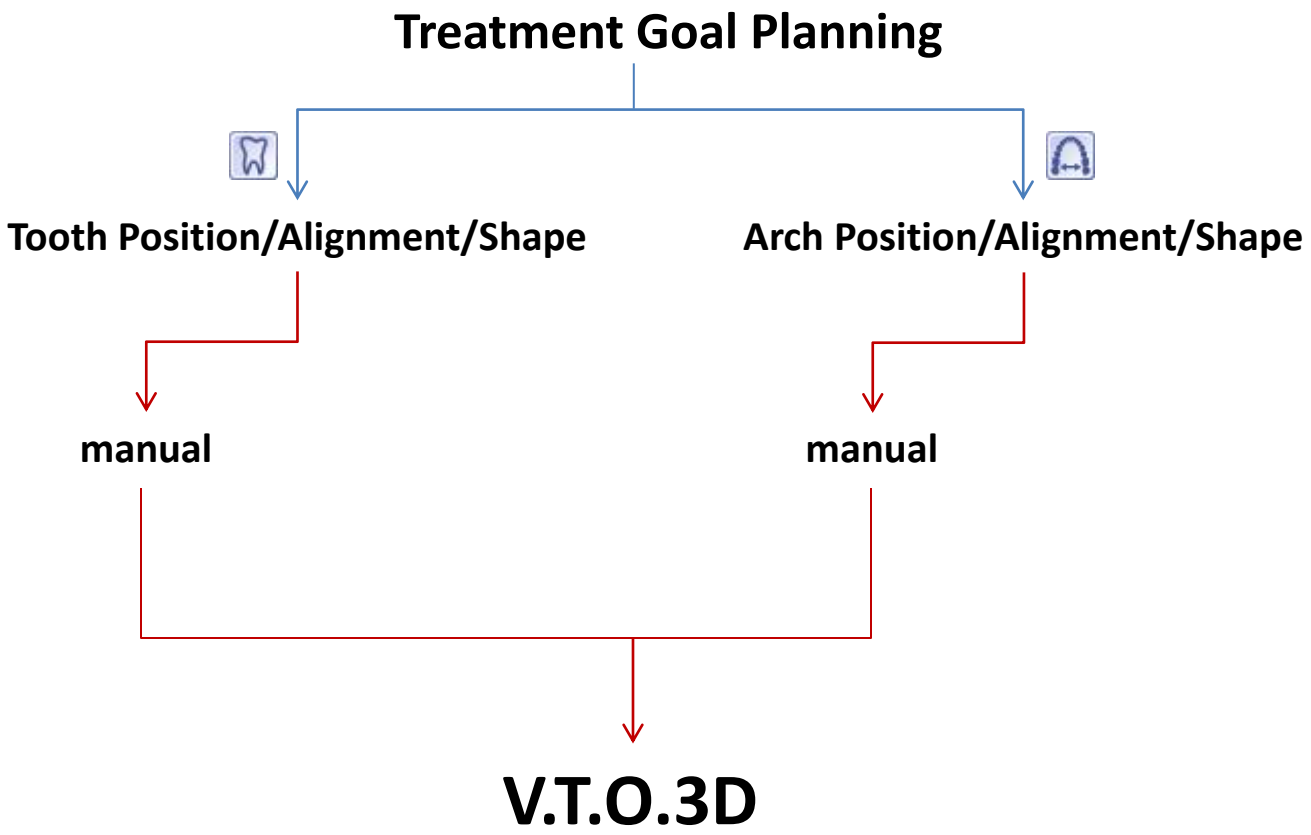
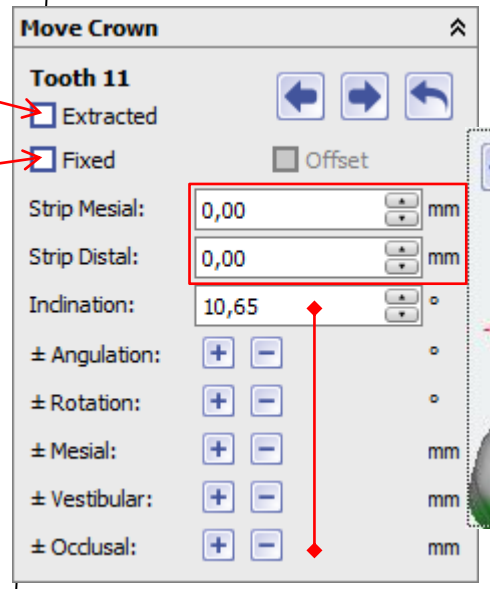
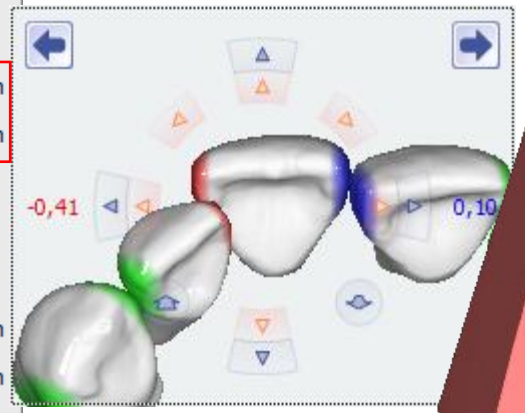


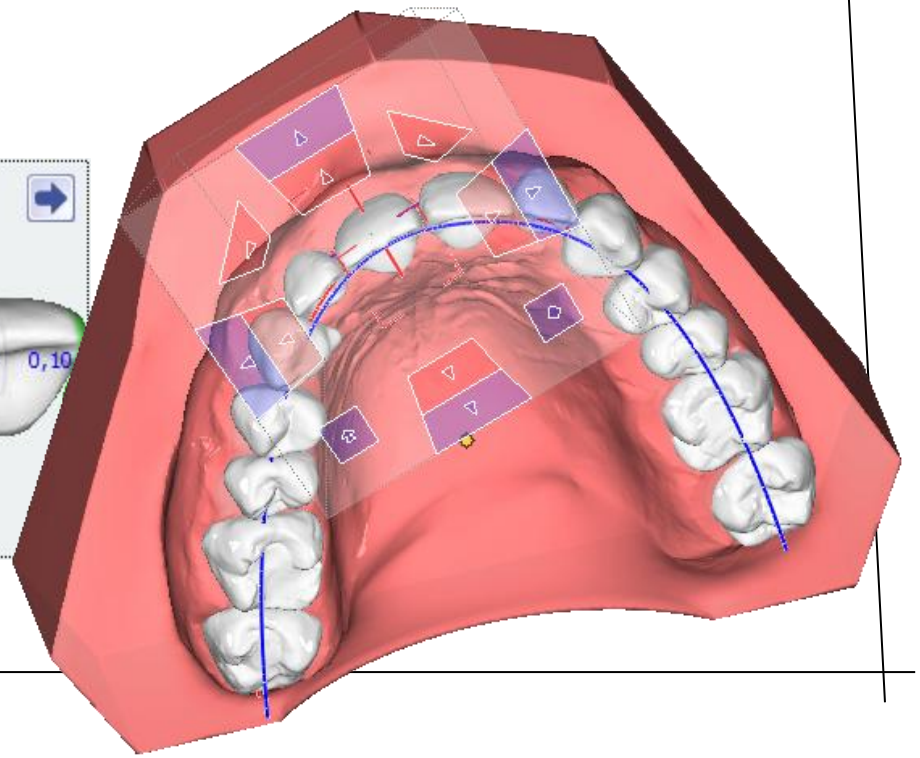
Virtual Setup

Treatment Goal Planning

Tooth Position/Alignment/Shape





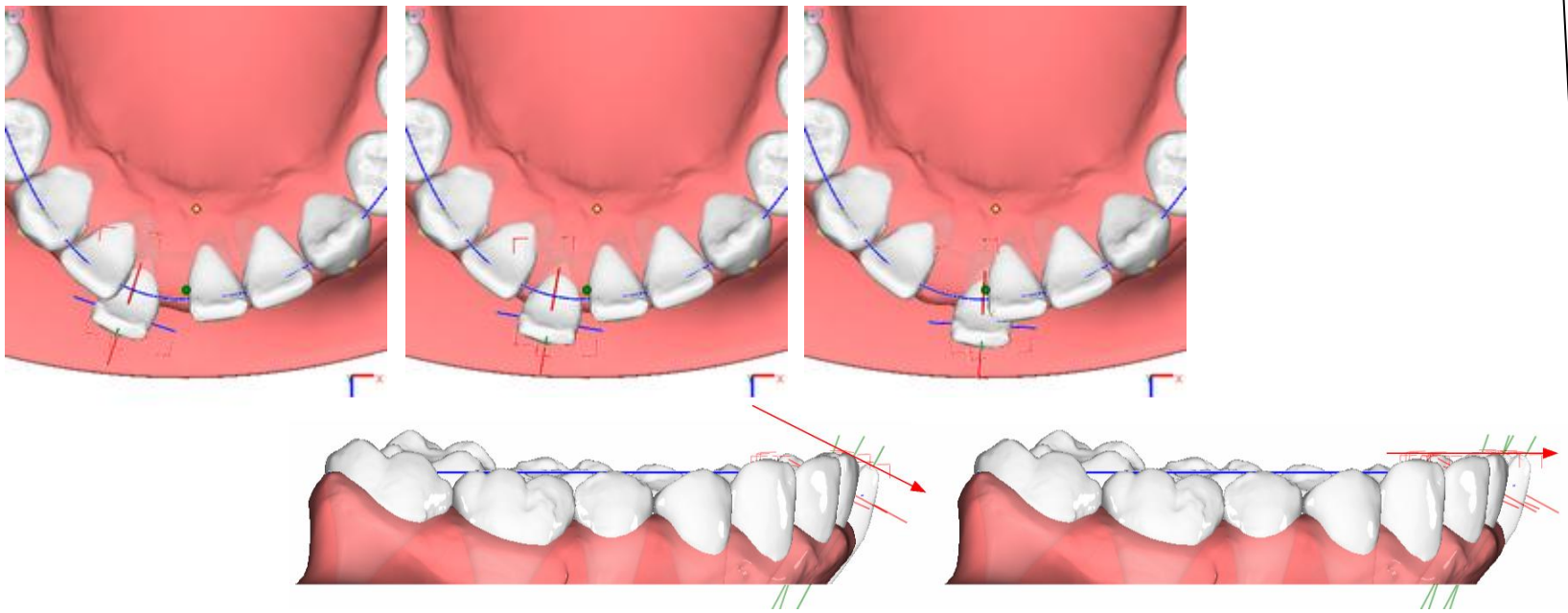


Module V.T.O.3D: **Manual** Controls **Tooth Position/Alignment**

Virtual Setup

Treatment Goal Planning

Tooth Position/Alignment/Shape

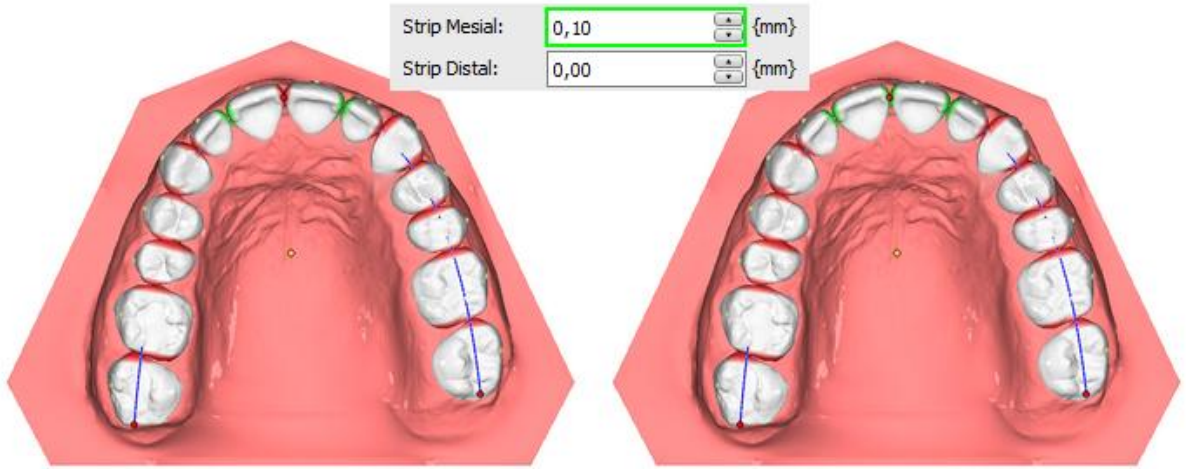


Module V.T.O.3D: **Manual** Controls **Tooth Position/Alignment**

Virtual Setup

Treatment Goal Planning

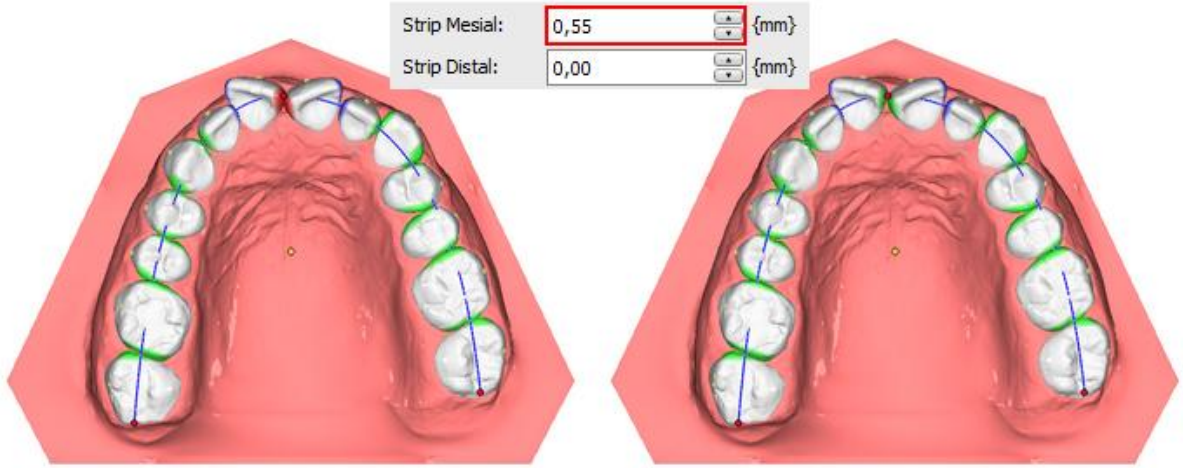
Tooth Position/Alignment/Shape



Virtual Setup

Treatment Goal Planning

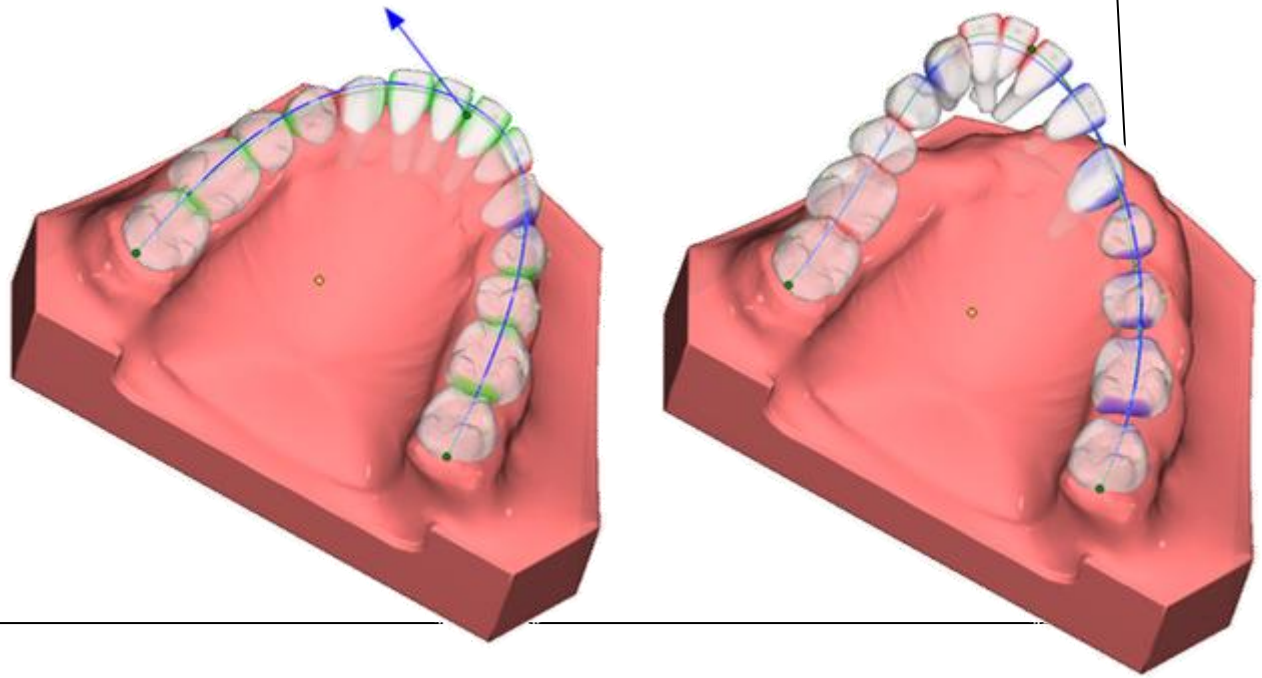
Tooth Position/Alignment/Shape



Virtual Setup

Treatment Goal Planning

Arch Position/Alignment/Shape

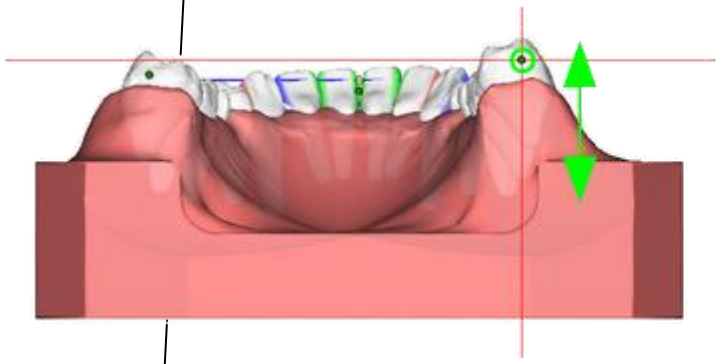


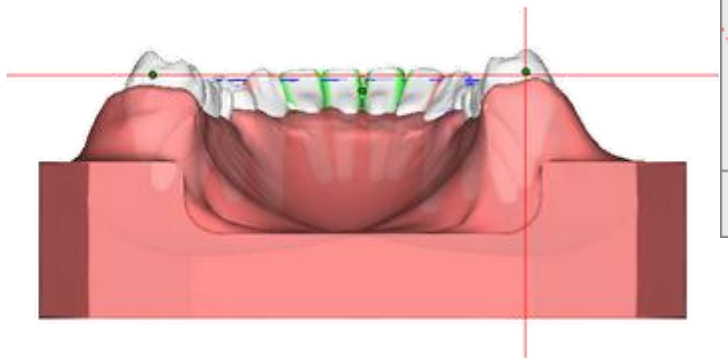
Module V.T.O.3D: **Manual** Controls **Arch Position/Alignment/Shape**

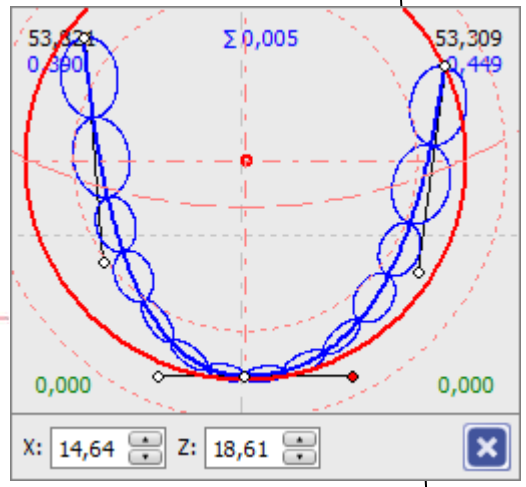
Virtual Setup

Treatment Goal Planning

Arch Position/Alignment/Shape

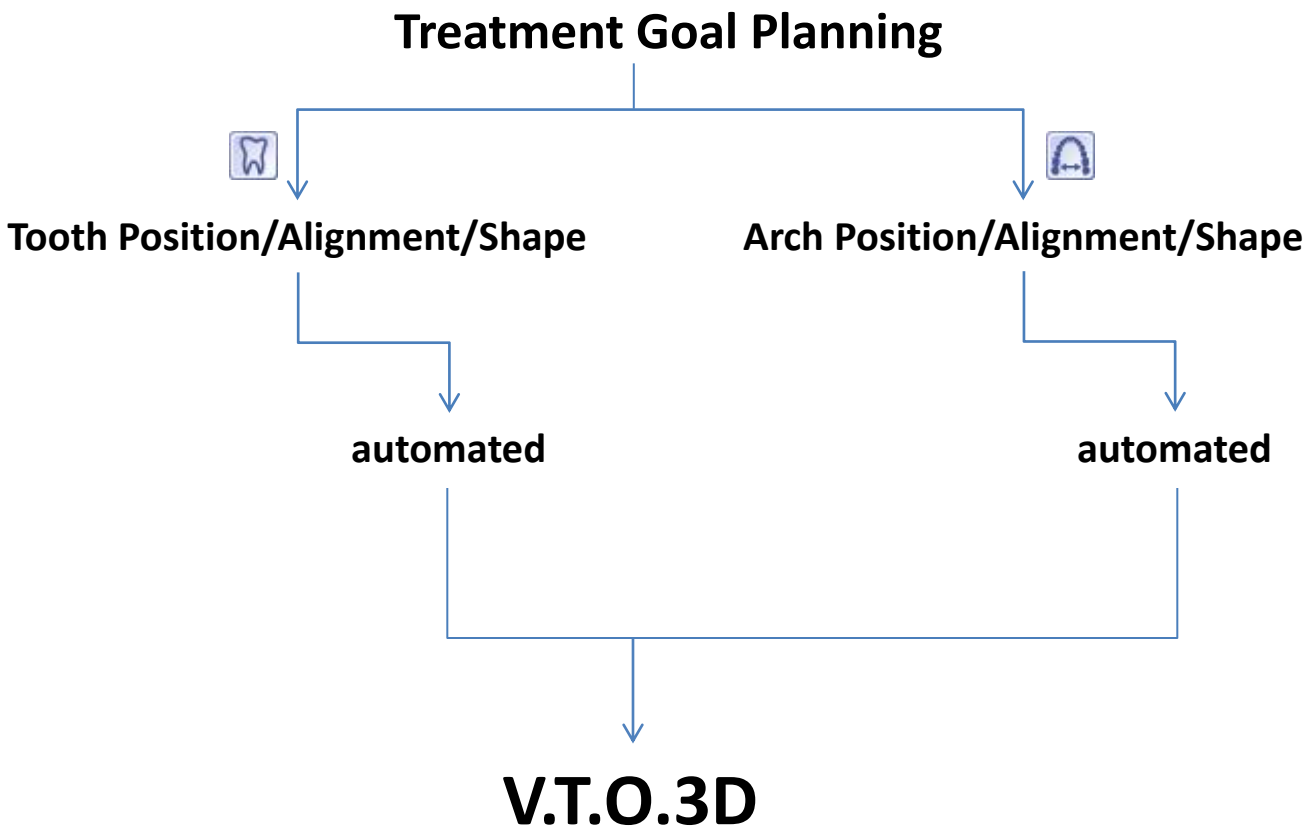






Module V.T.O.3D: **Manual** Controls **Arch Position/Alignment/Shape**

Virtual Setup

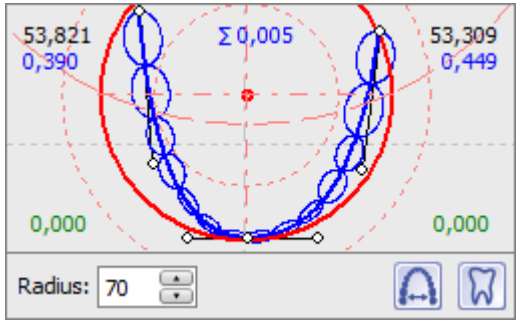


Virtual Setup

Treatment Goal Planning

Tooth Position/Alignment/Shape

Arch Position/Alignment/Shape



- Fit to Max. Arch
- Load inclination
- Harmonize Angulation
- Harmonize FA
- Set FA on Arch-Plane
- Compensate space discrepancy
- Compensate Collisions
- Settling

- Fit to Malocclusion
- Fit to Mandible
- Balanced in Y
- Balanced in XZ
- Balanced in XYZ
- Center Dental Midpoint

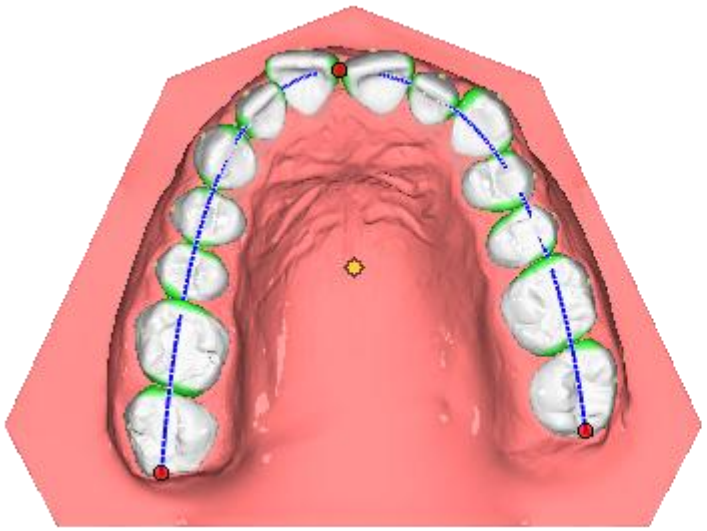
- Fit to Malocclusion
- Balanced in Y
- Balanced in XZ
- Balanced in XYZ
- Center Dental Midpoint
- Fit to WALA

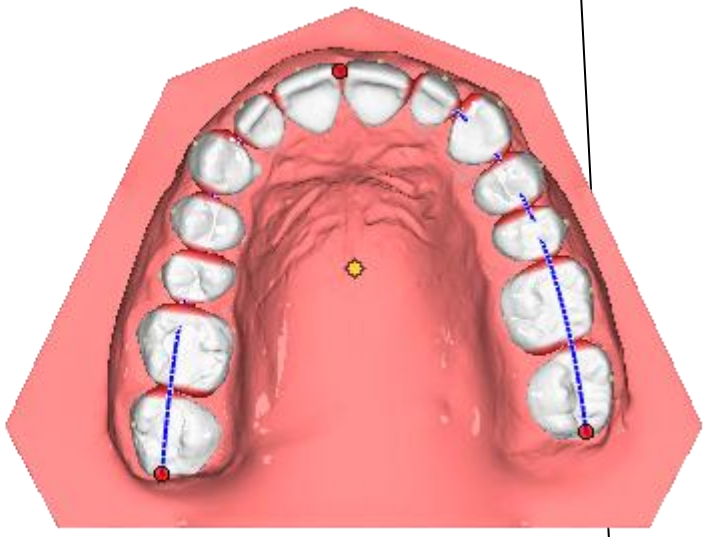
Virtual Setup

Treatment Goal Planning

Tooth Position/Alignment/Shape

- Fit to Max. Arch
- Load inclination
- Harmonize Angulation
- Harmonize FA
- Set FA on Arch-Plane
- Compensate space discrepancy
- Compensate Collisions
- Settling





Automated Controls **Tooth Position/Alignment**

Virtual Setup

Treatr

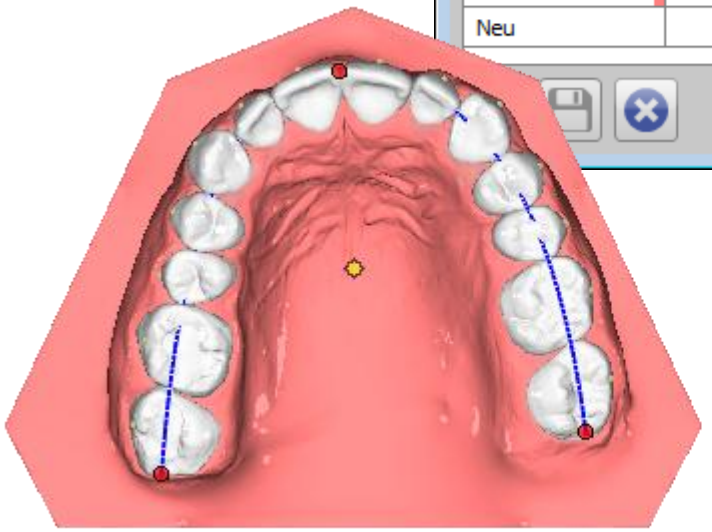
Tooth Position/Alignment/Sh

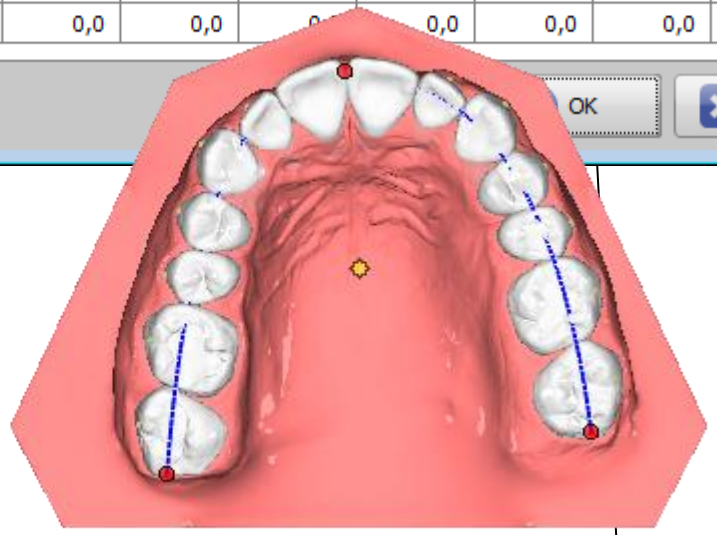
Inklination (Maxilla)

# Zahn	1	2	3	4	5	6	7	8
Keine Änderung								
Sampermans	16,0	9,0	0,0	-8,0	-8,0	-17,0	-17,0	
Gianelli	12,0	8,0	0,0	0,0	0,0	0,0	0,0	
Cetlin	24,0	16,0	0,0	-7,0	-7,0	-14,0	-14,0	
Roncone	18,0	10,0	0,0	-10,0	-10,0	-20,0	-20,0	
MBT	17,0	10,0	-7,0	-7,0	-7,0	-14,0	-14,0	
Roth	12,0	8,0	-2,0	-7,0	-7,0	-14,0	-14,0	
Andrews SWA	7,0	3,0	-7,0	-7,0	-7,0	-9,0	-9,0	
Neu	0,0	0,0	0,0	[illegible]	0,0	0,0	0,0	

OK Abbrechen

- Fit to Max. Arch
- Load inclination
- Harmonize Angulation
- Harmonize FA
- Set FA on Arch-Plane
- Compensate space discrepancy
- Compensate Collisions
- Settling



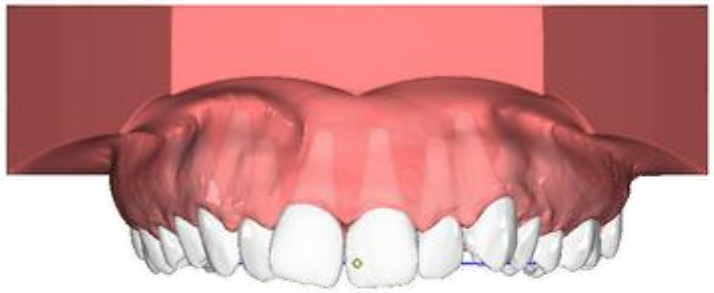


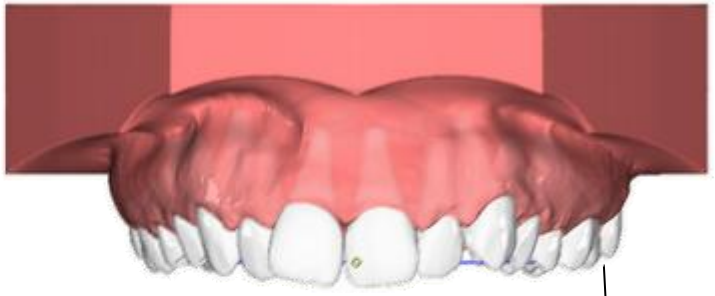
Automated Controls **Tooth Position/Alignment**

Virtual Setup

Treatment Goal Planning

Tooth Position/Alignment/Shape





- Fit to Max. Arch
- Load inclination
- Harmonize Angulation
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- Set FA on Arch-Plane
- Compensate space discrepancy
- Compensate Collisions
- Settling

Zahn 11		Zahn 21	
Breite:	8,57mm	Breite:	8,64mm
Strip Mesial:	0,00mm	Strip Mesial:	0,00mm
Strip Distal:	0,00mm	Strip Distal:	0,00mm
Inklination:	11° (±0°)	Inklination:	7° (±0°)
Angulation:	-11° (±0°)	Angulation:	-4° (±0°)
Drehung	-1° (±0°)	Drehung	-11° (±0°)

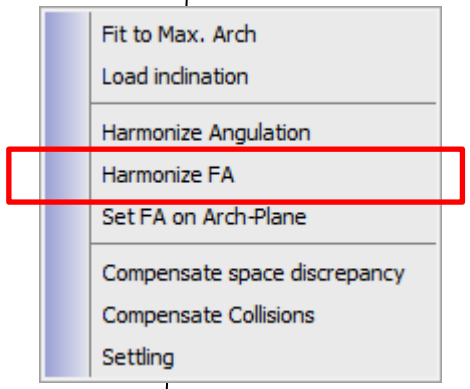
Zahn 11		Zahn 21	
Breite:	8,57mm	Breite:	8,64mm
Strip Mesial:	0,00mm	Strip Mesial:	0,00mm
Strip Distal:	0,00mm	Strip Distal:	0,00mm
Inklination:	11° (±0°)	Inklination:	7° (±0°)
Angulation:	-7° (+3°)	Angulation:	-7° (-3°)
Drehung	-2° (-1°)	Drehung	-10° (+1°)

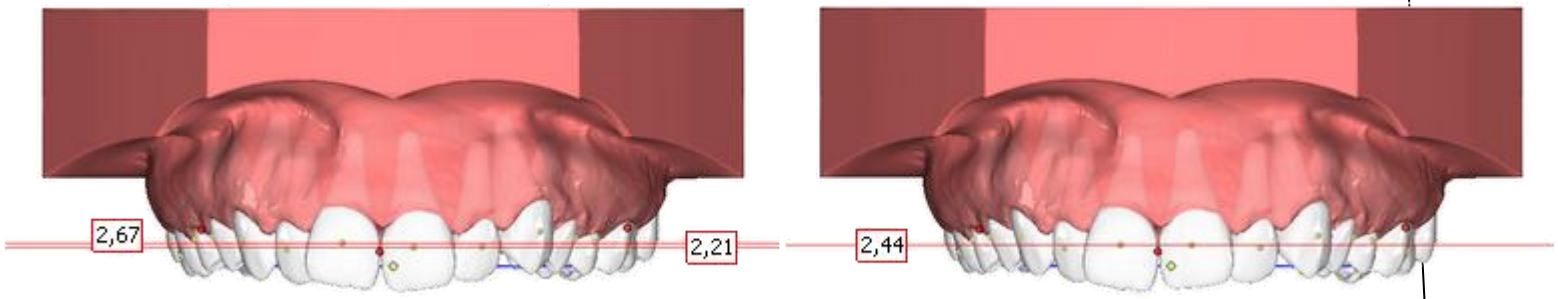
Automated Controls **Tooth Position/Alignment**

Virtual Setup

Treatment Goal Planning

Tooth Position/Alignment/Shape



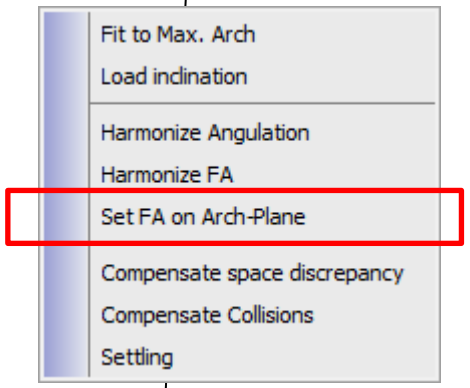


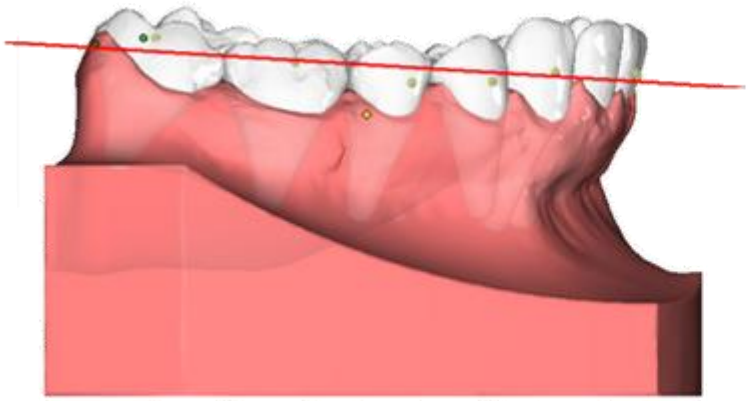
Automated Controls **Tooth Position/Alignment**

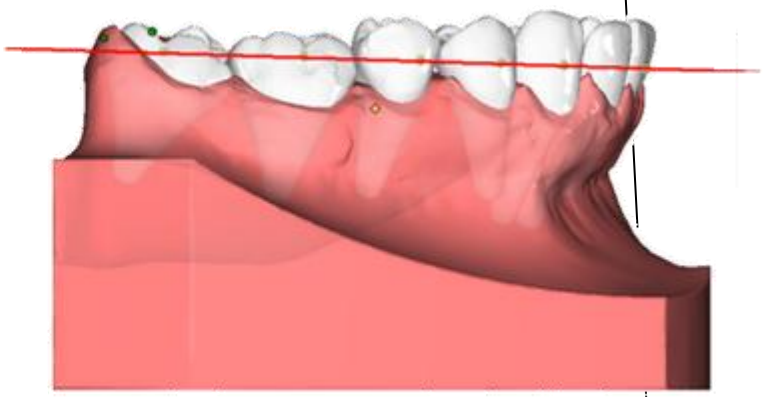
Virtual Setup

Treatment Goal Planning

Tooth Position/Alignment/Shape





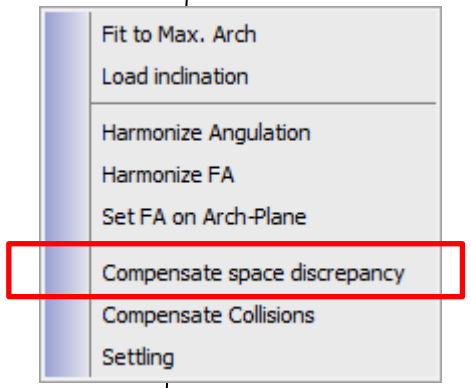


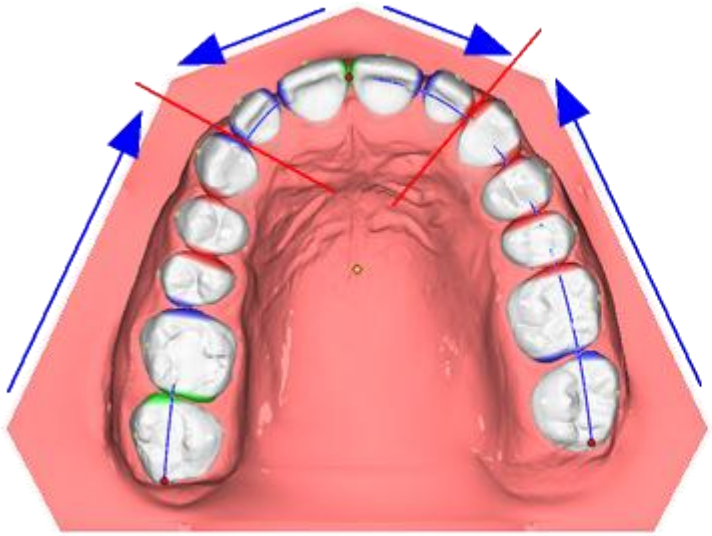
Automated Controls **Tooth Position/Alignment**

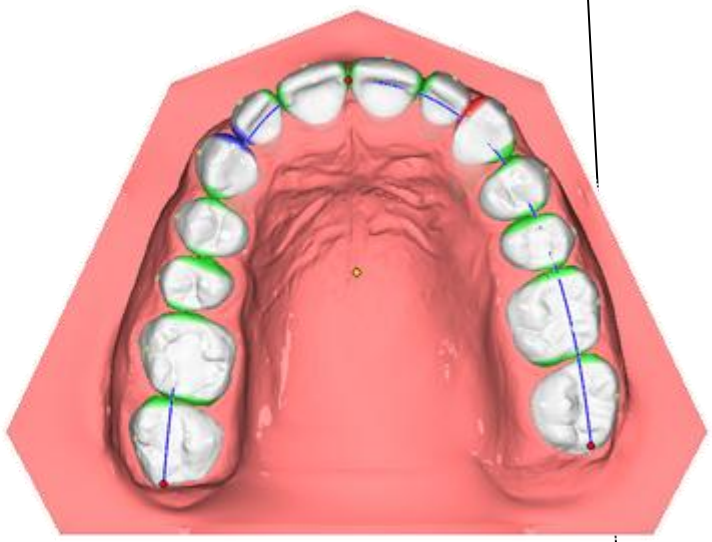
Virtual Setup

Treatment Goal Planning

Tooth Position/Alignment/Shape





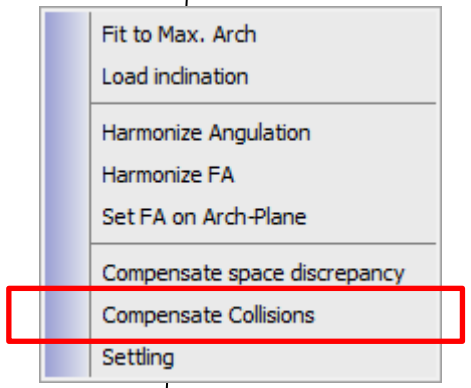


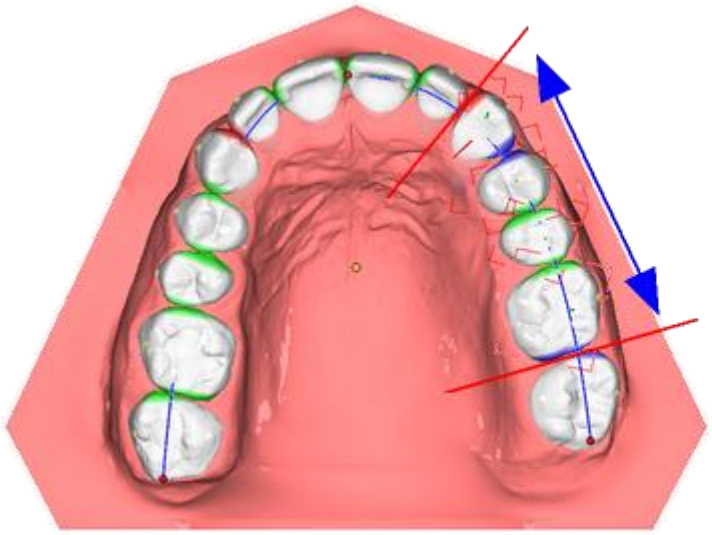
Automated Controls **Tooth Position/Alignment**

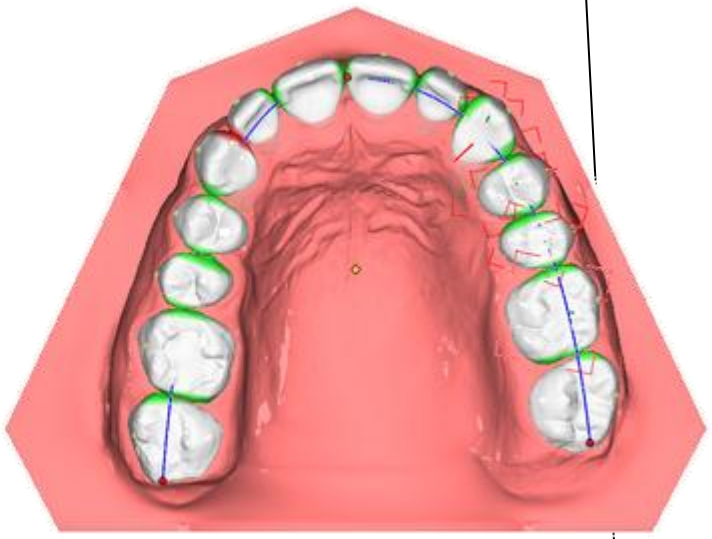
Virtual Setup

Treatment Goal Planning

Tooth Position/Alignment/Shape





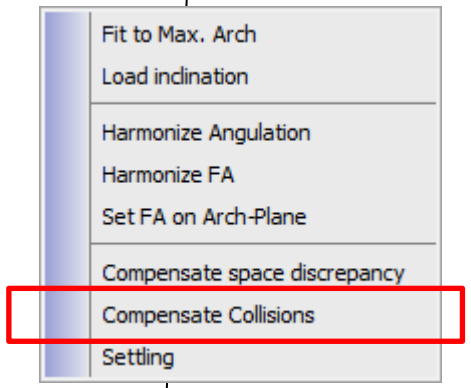


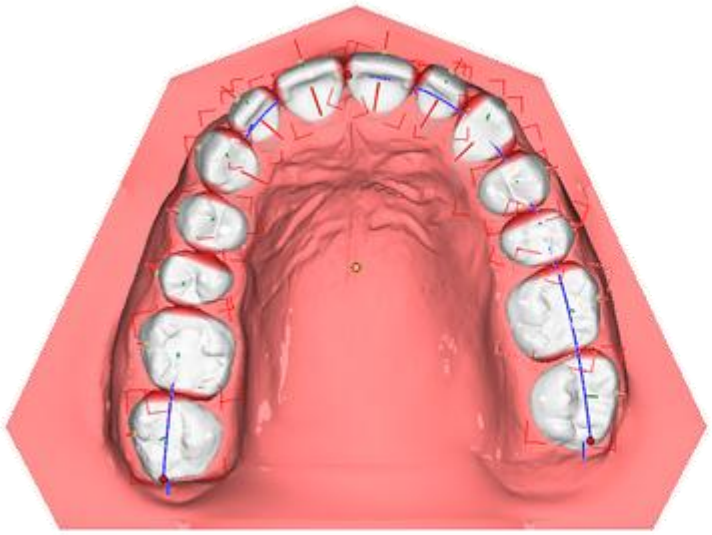
Automated Controls **Tooth Position/Alignment**

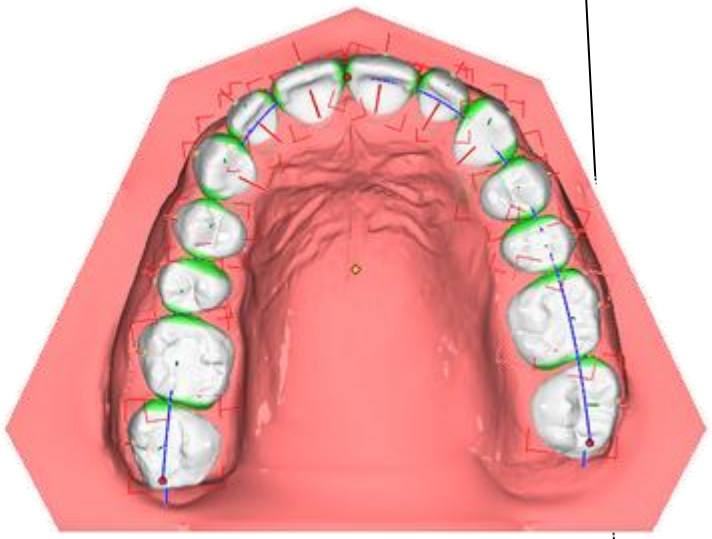
Virtual Setup

Treatment Goal Planning

Tooth Position/Alignment/Shape





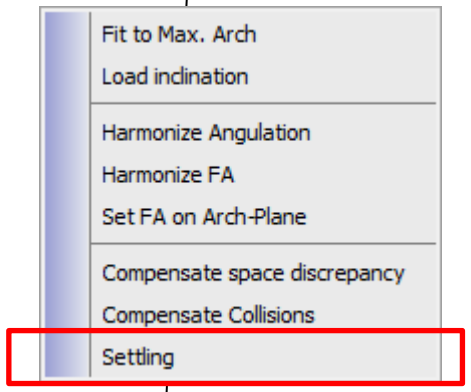


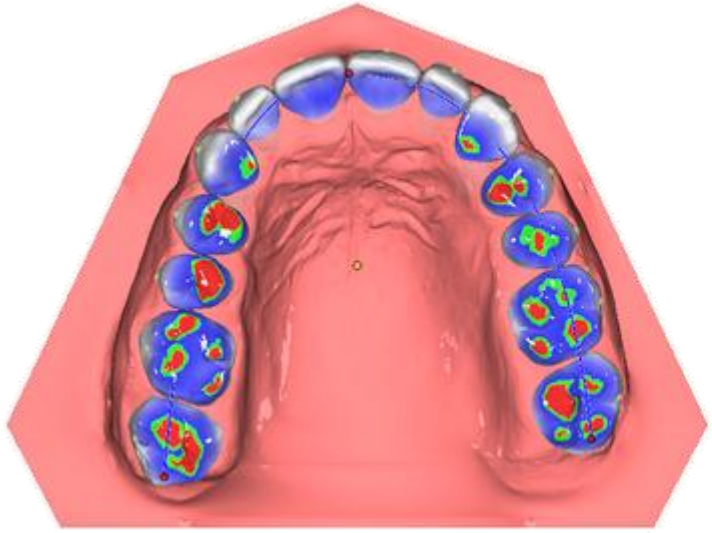
Automated Controls **Tooth Position/Alignment**

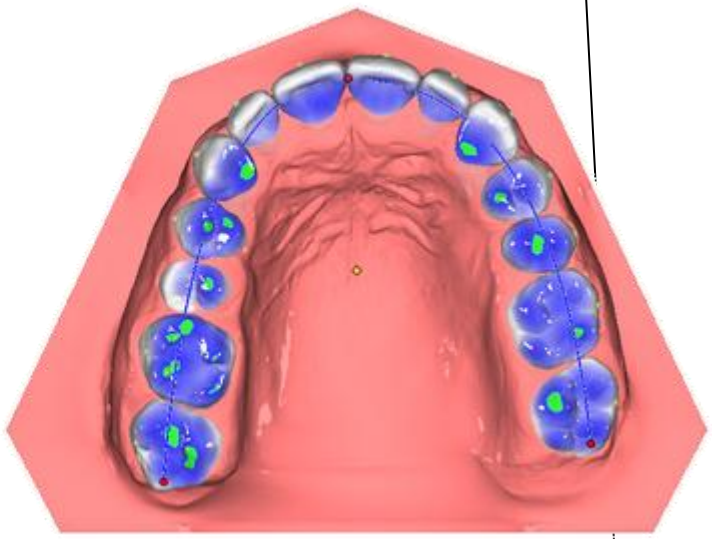
Virtual Setup

Treatment Goal Planning

Tooth Position/Alignment/Shape





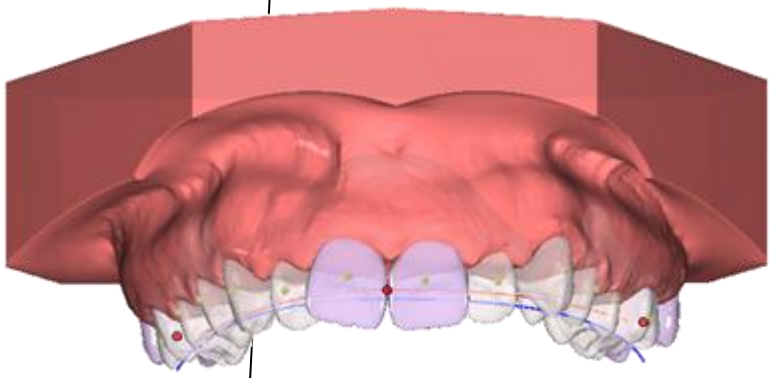


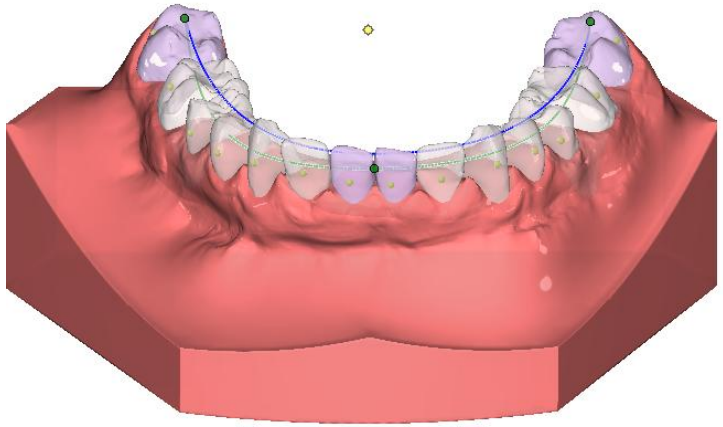
Automated Controls **Tooth Position/Alignment**

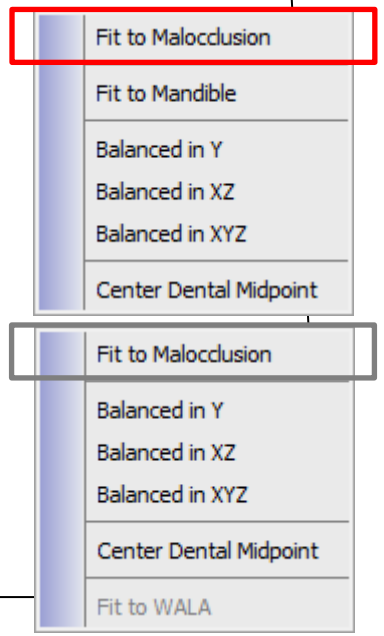
Virtual Setup

Treatment Goal Planning

Arch Position/Alignment/Shape



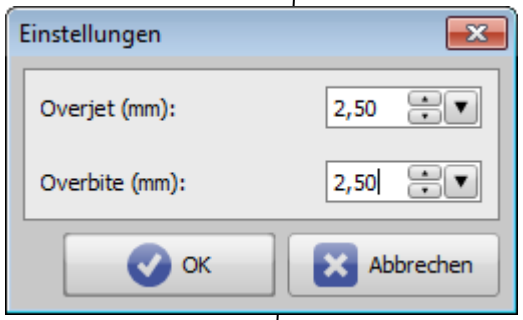




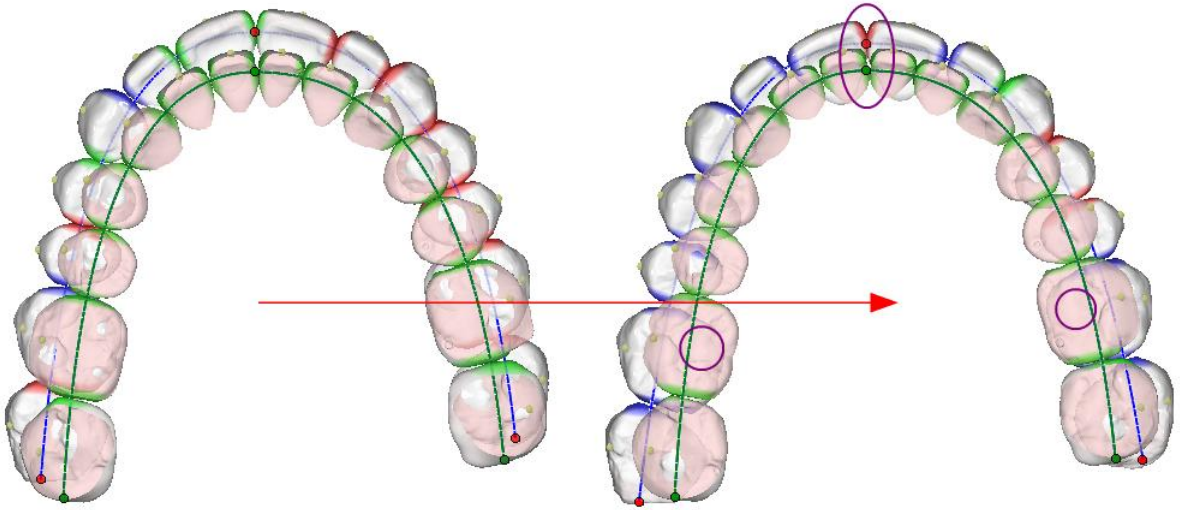
Automated Controls **Arch Position/Alignment/Shape**

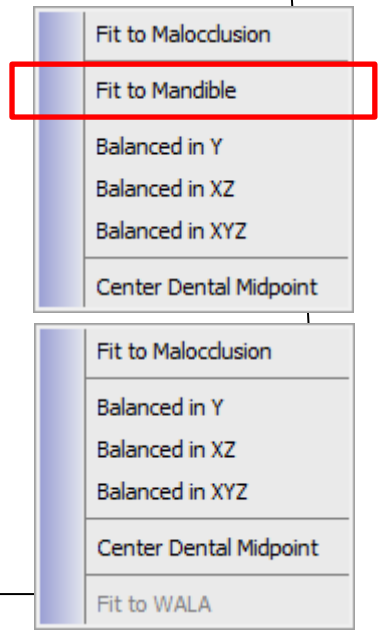
Virtual Setup

Treatment Goal Planning



Arch Position/Alignment/Shape



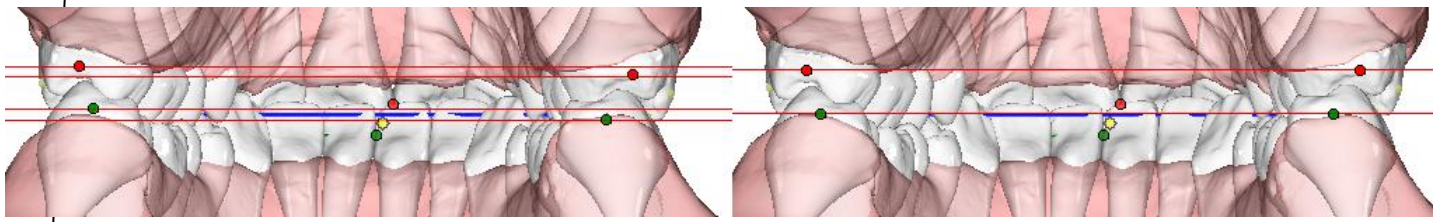


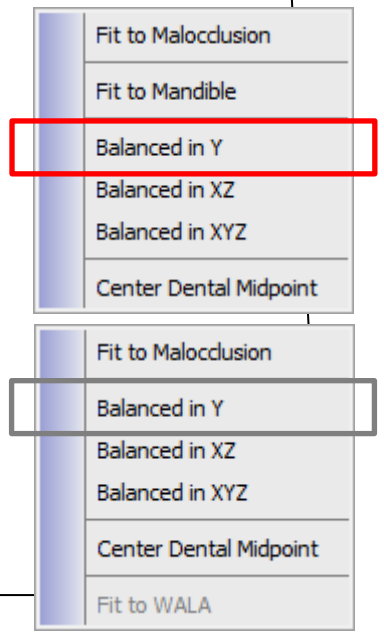
Automated Controls **Arch Position/Alignment/Shape**

Virtual Setup

Treatment Goal Planning

Arch Position/Alignment/Shape



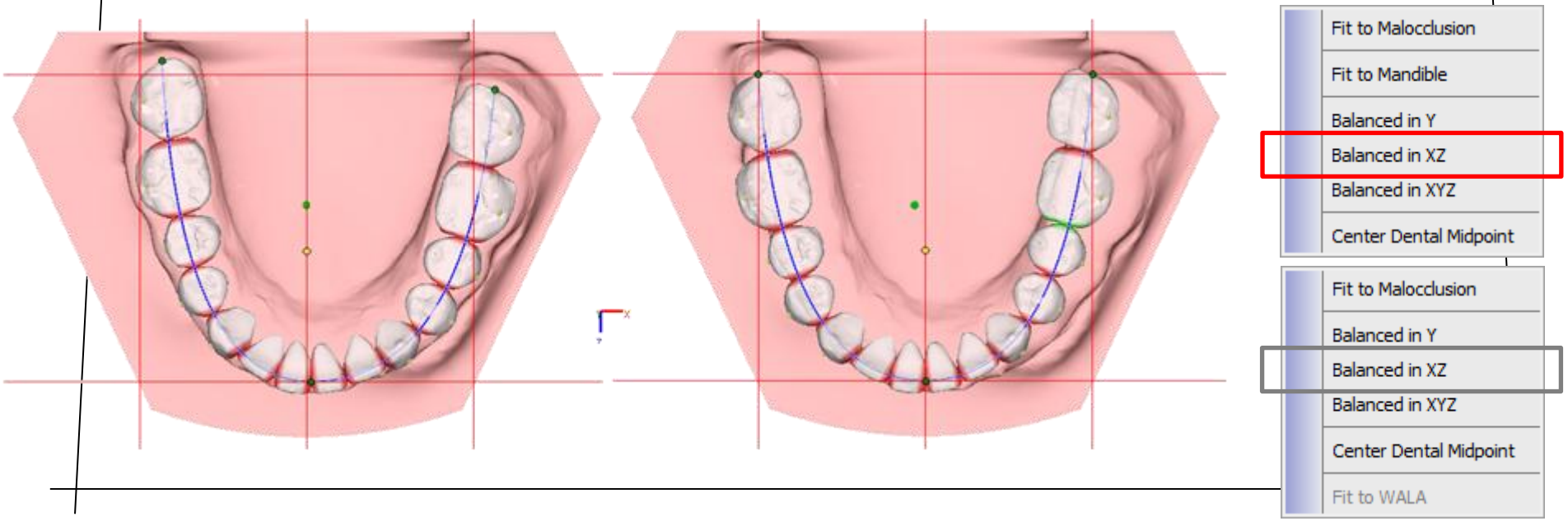


Automated Controls **Arch Position/Alignment/Shape**

Virtual Setup

Treatment Goal Planning

Arch Position/Alignment/Shape

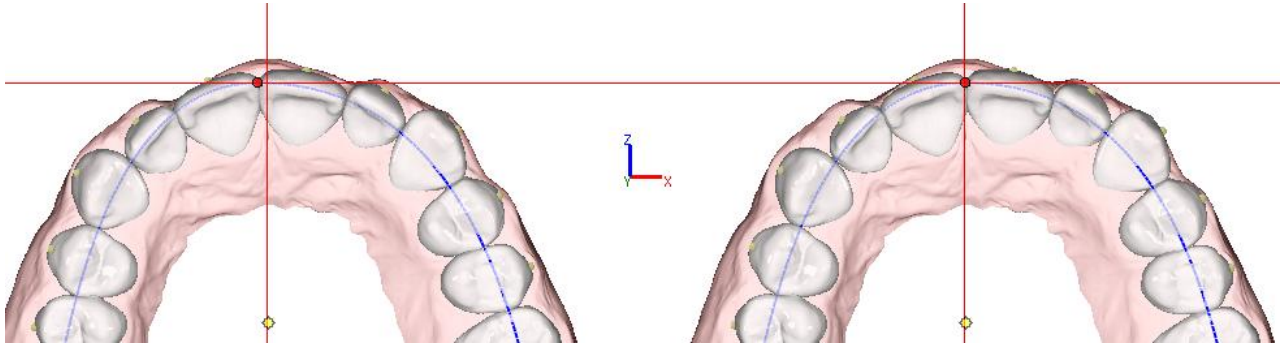


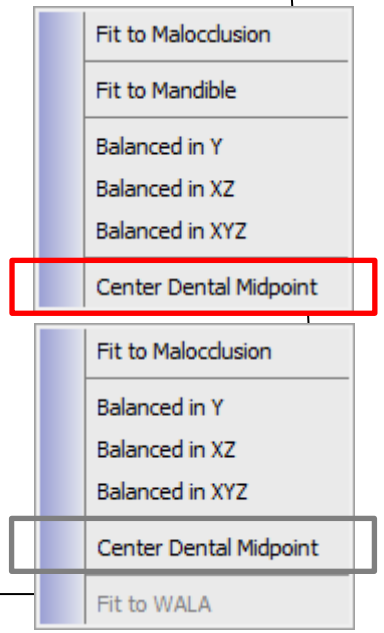
Automated Controls **Arch Position/Alignment/Shape**

Virtual Setup

Treatment Goal Planning

Arch Position/Alignment/Shape



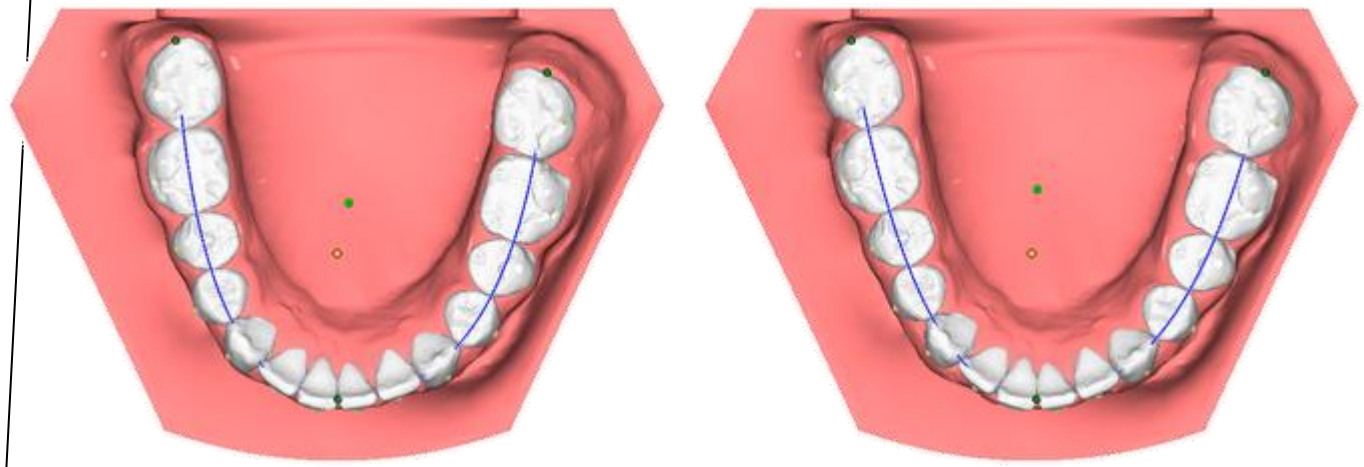


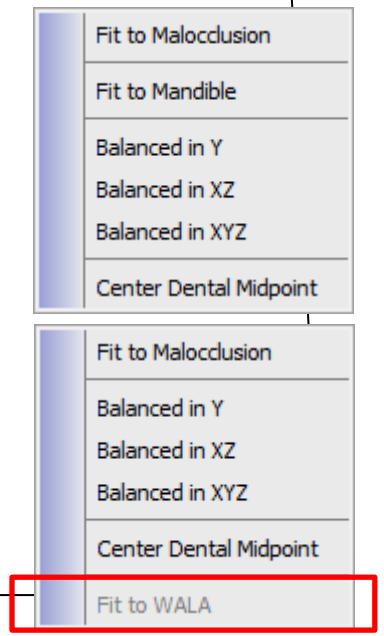
Automated Controls **Arch Position/Alignment/Shape**

Virtual Setup

Treatment Goal Planning

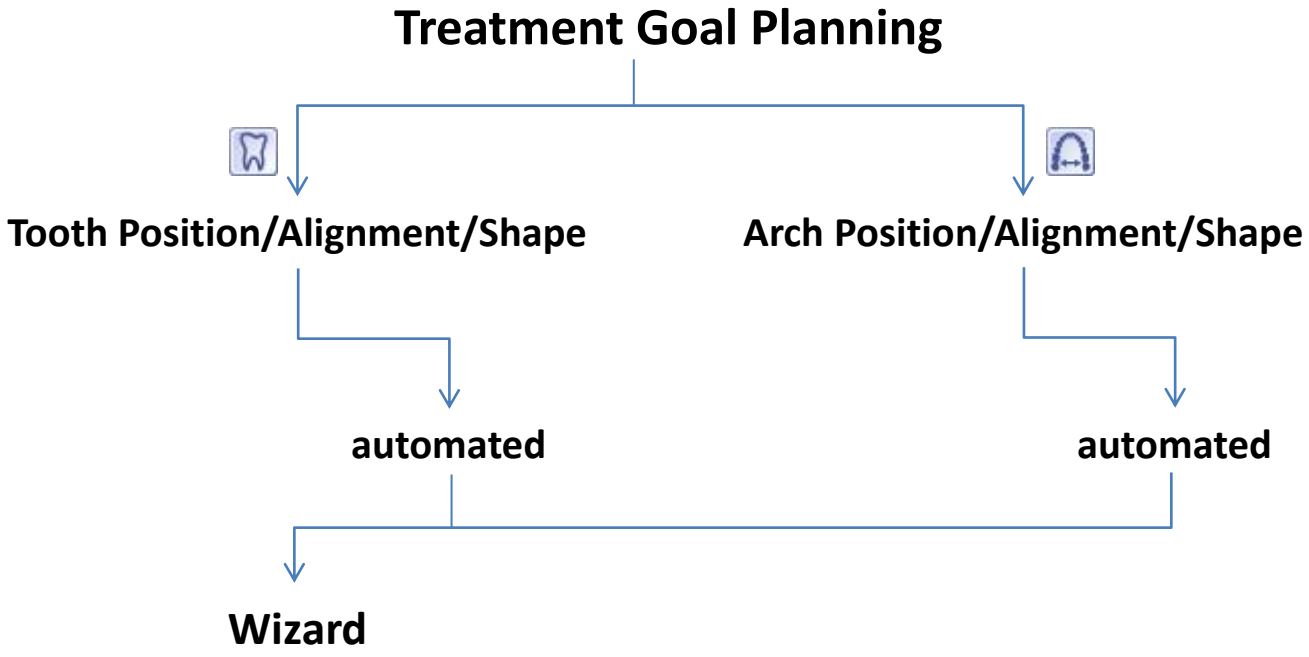
Arch Position/Alignment/Shape

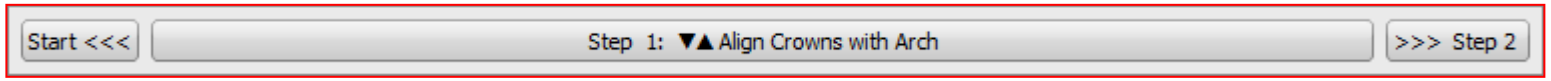




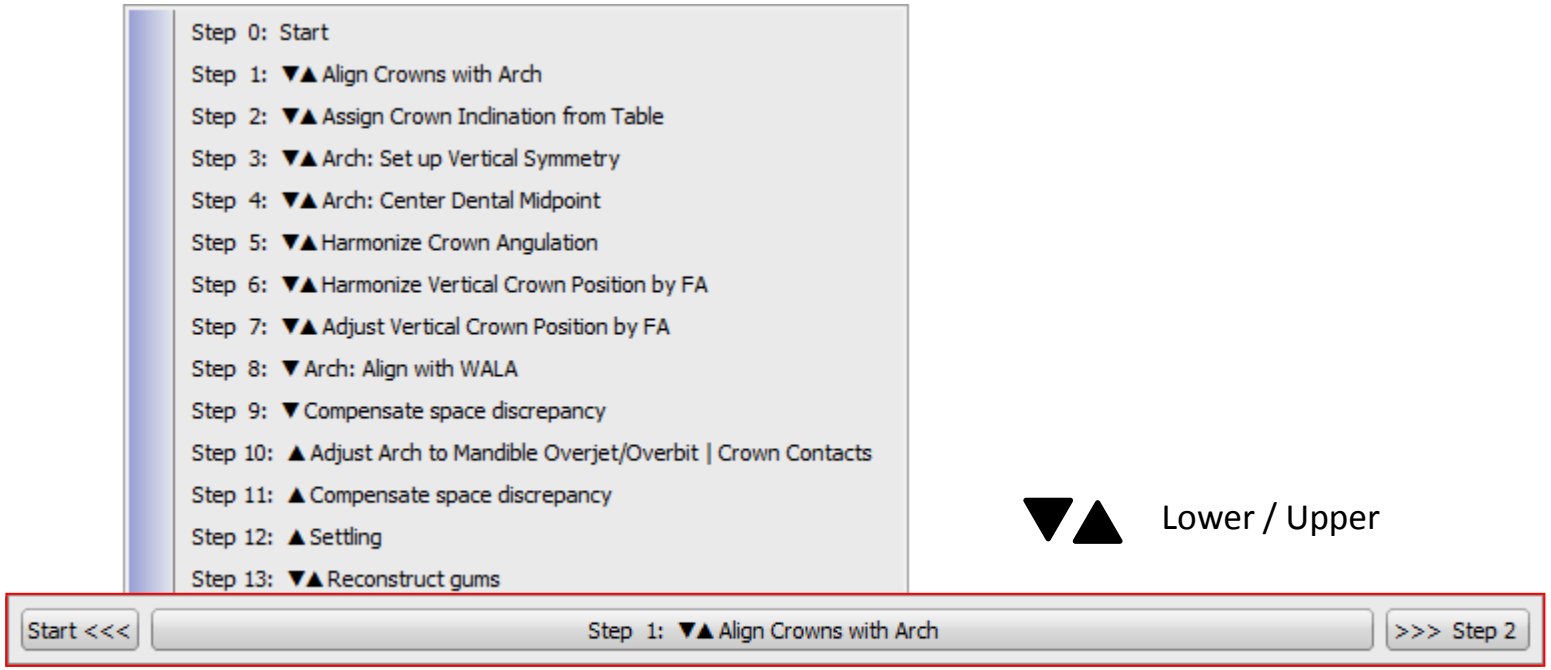
Automated Controls **Arch Position/Alignment/Shape**

Virtual Setup



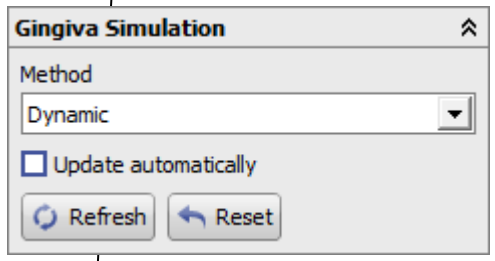


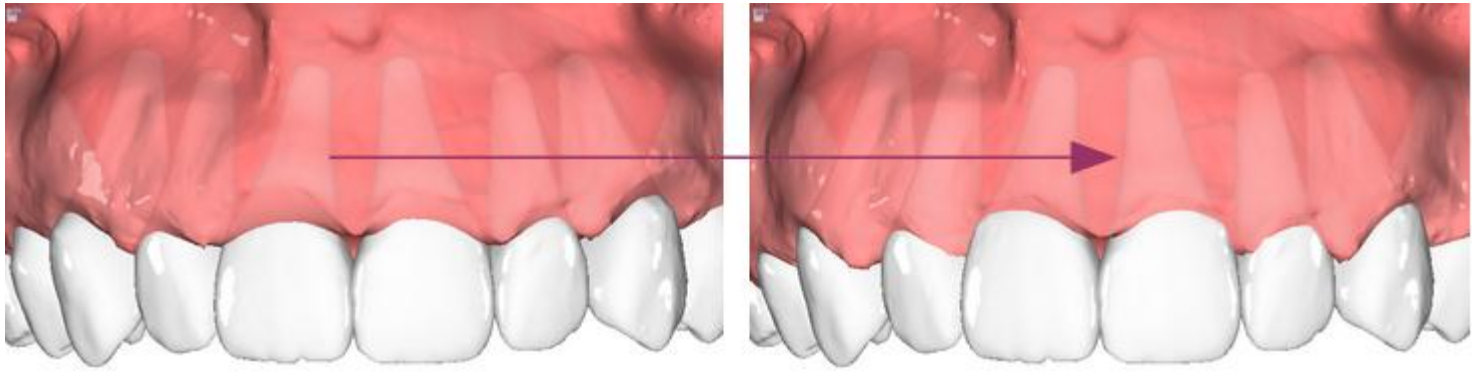
Virtual Setup



▼▲ Lower / Upper

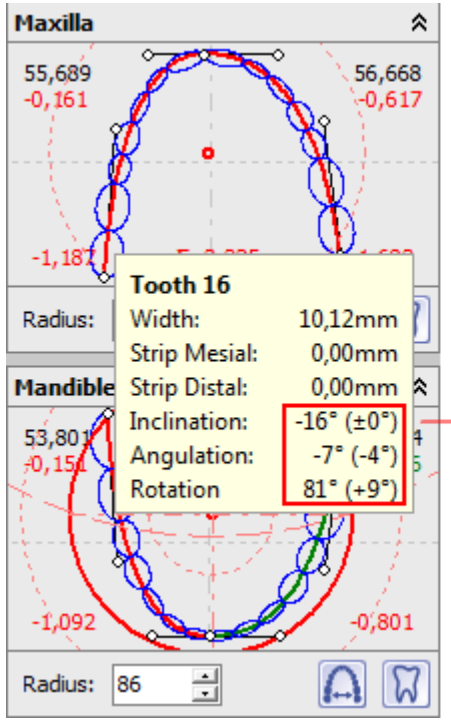
Virtual Setup





Controls: Gingiva Simulation

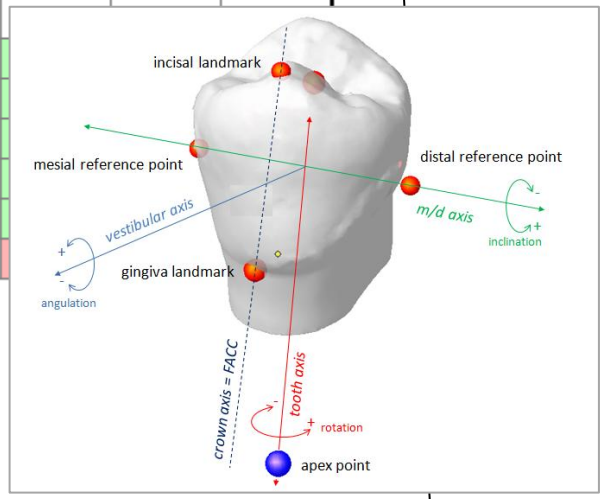
Virtual Setup



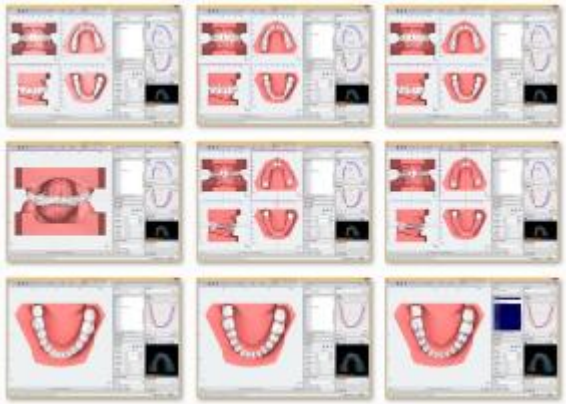
Current Tooth Movement

Maxilla								
Tooth	18	17	16	15	14	13	12	11
ASR mesial [mm]		0,00	0,00	0,00	0,00	0,00	0,00	0,00
ASR distal [mm]		0,00	0,00	0,00	0,00			
Inklination +/- [°]		0,3	0,2	0,0	0,1			
Angulation +/- [°]		-2,2	-3,9	-16,7	-5,1			
Rotation +/- [°]		[illegible]	8,9	15,3	-5,0			
Mesial +/- [mm]		-0,02	-0,21	-0,37	-0,67			
Vestibulär +/- [mm]		-0,44	-0,50	-0,81	0,20			
Okklusal +/- [mm]		0,10	0,17	1,27	1,72			

Limitation

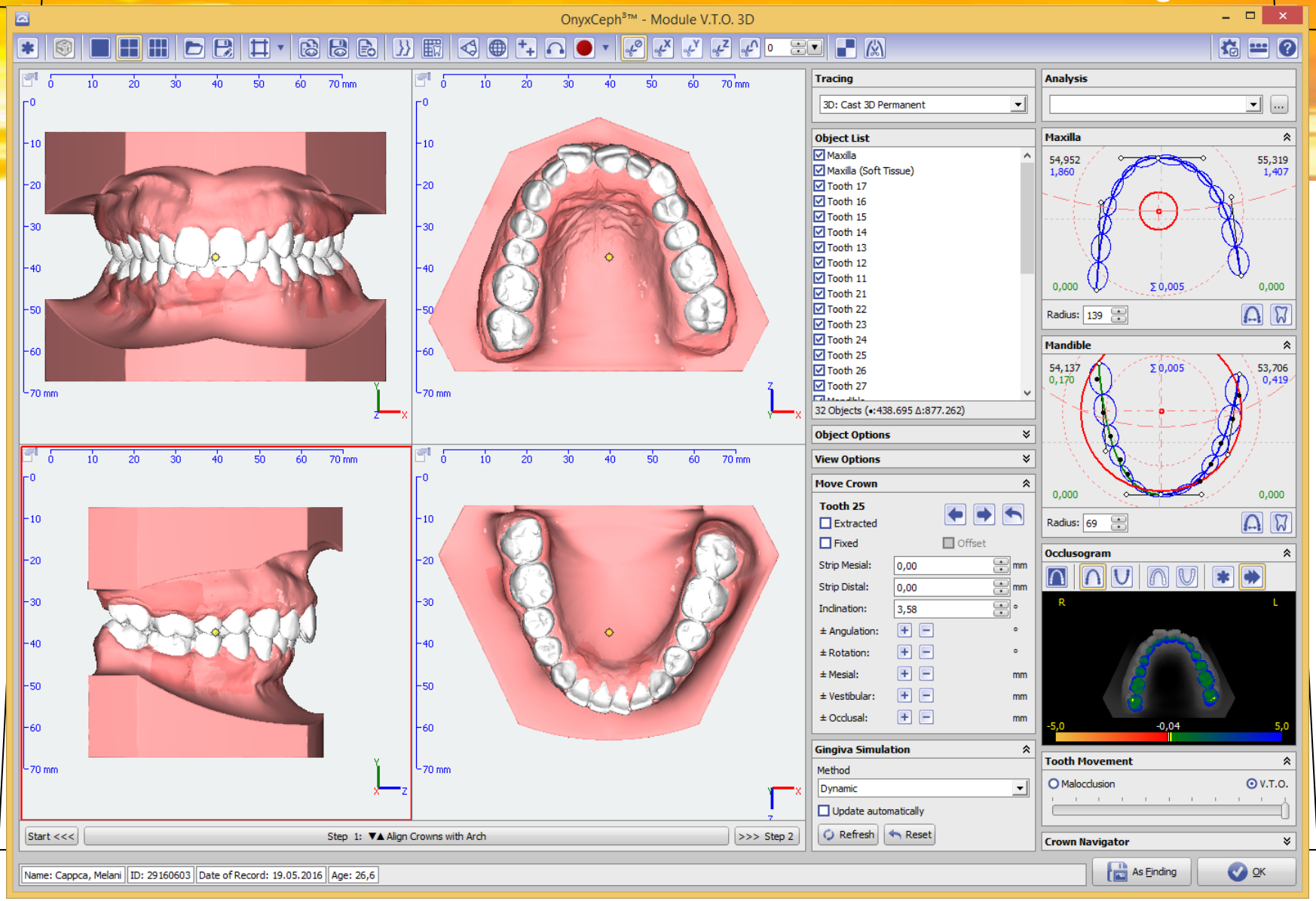


Virtual Setup

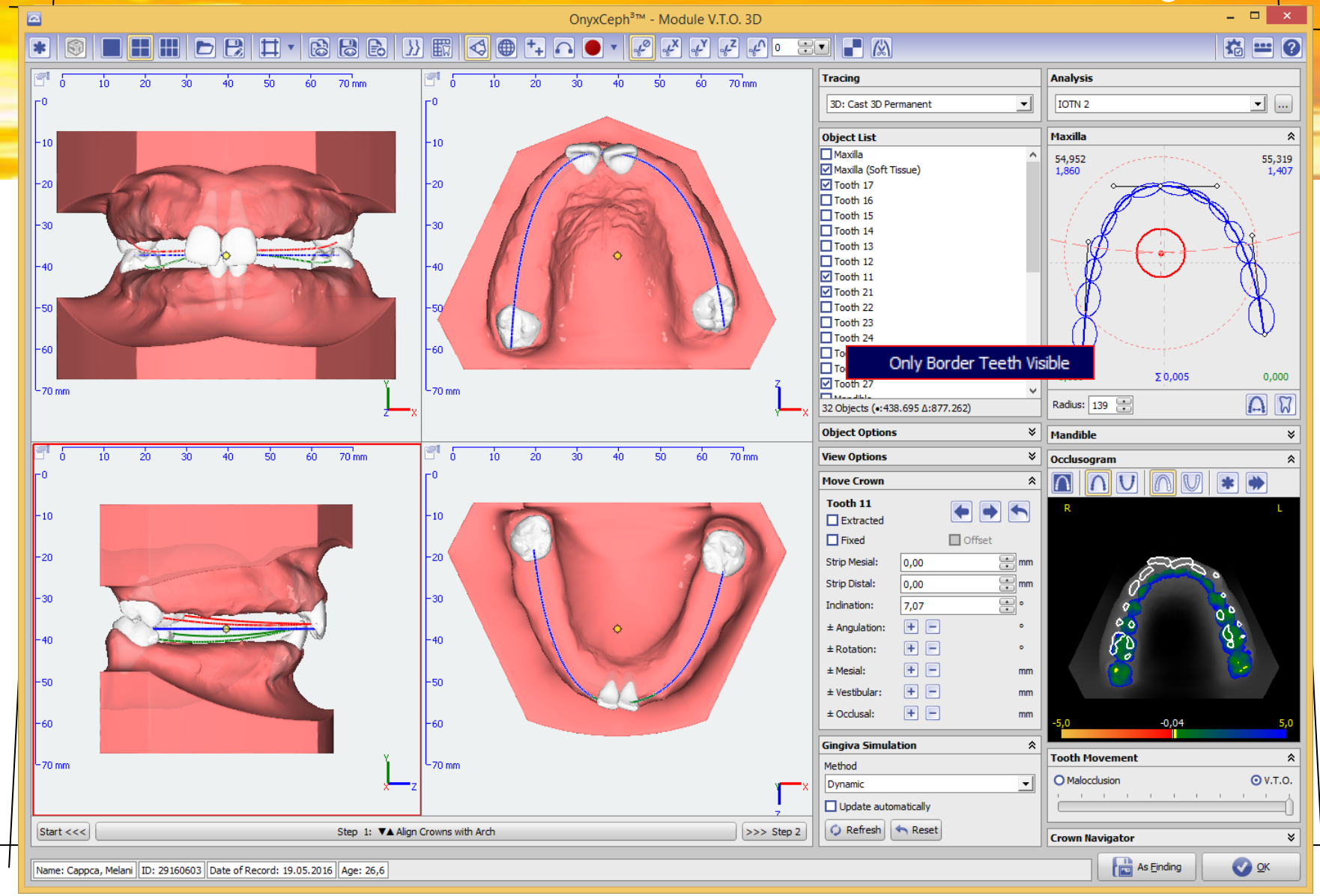


Add Image
Adjust Image
Digitize
Combine
Mirror
Image Comparison
Treatment Simulation 3D
Waefer Creation 3D
Cast Adjust
Segmentation
FA_Bonding
V.T.O.3D
Wire Bonding
Kylix 3D
Splint 3D
Aligner 3D
Bonding Trays 3D
Bracket Adapt
Retainer 3D

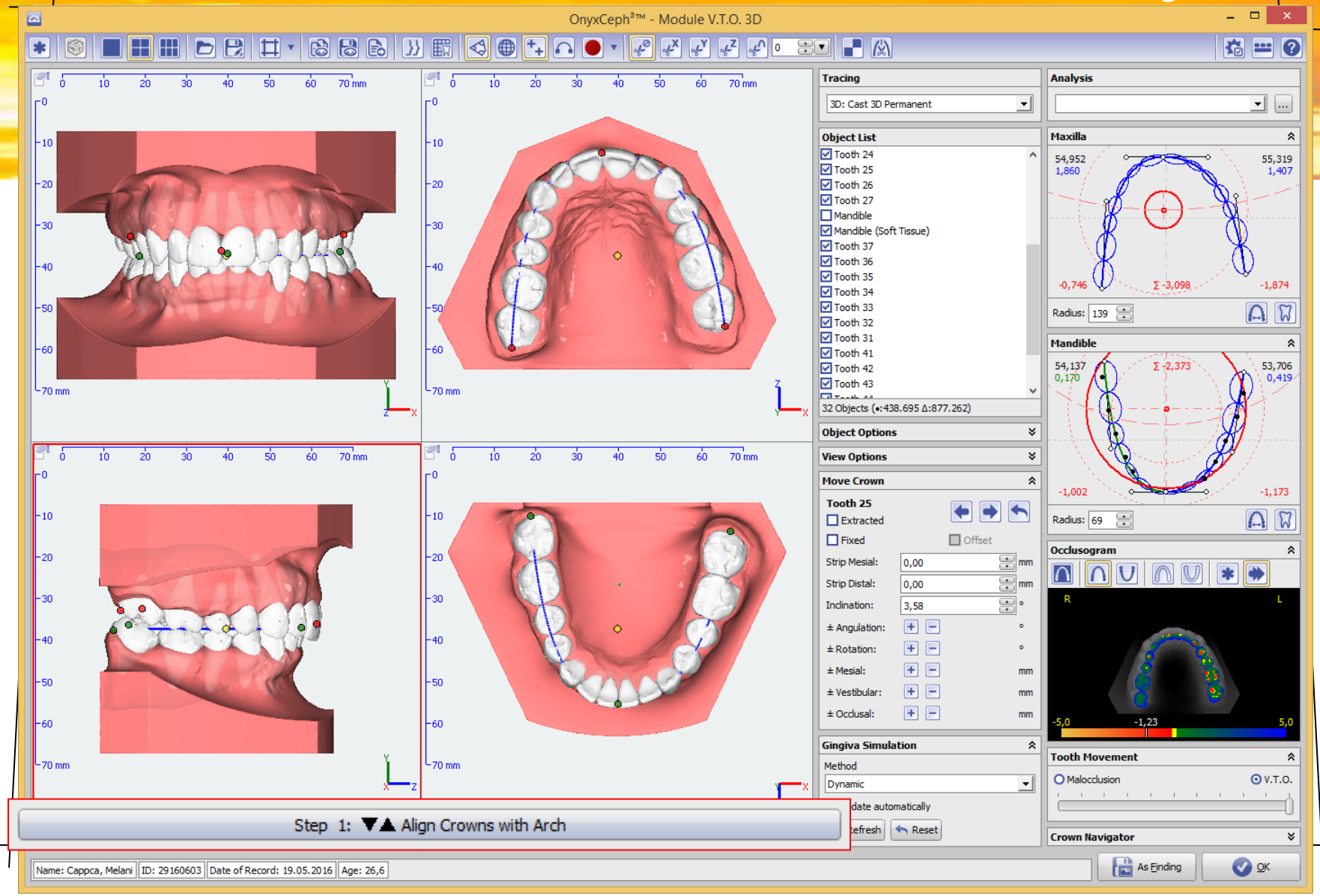
Virtual Setup: Example



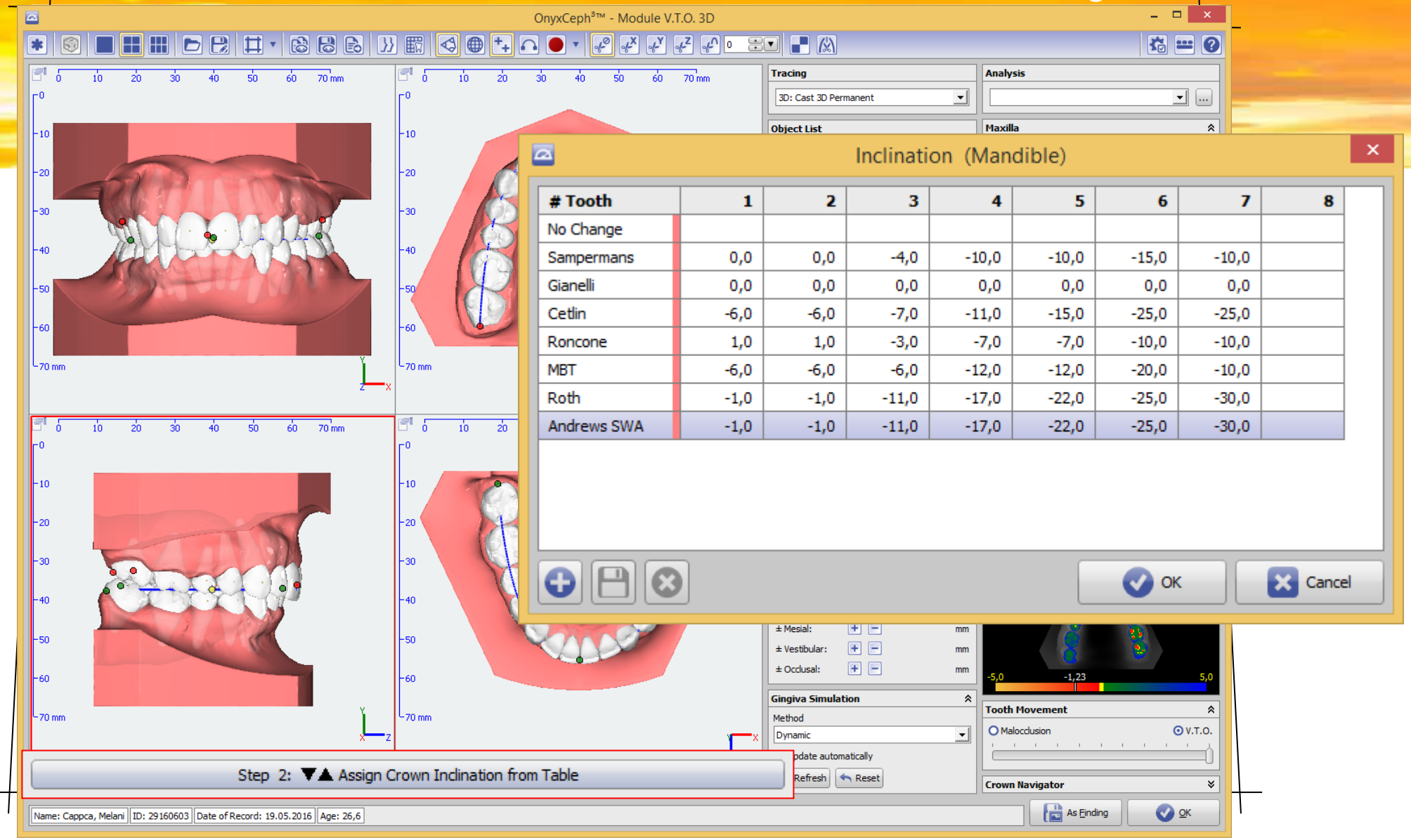
V.T.O.3D – Wizard: Start Situation



V.T.O.3D – Wizard: Start Situation – **Only Border Teeth Visible**

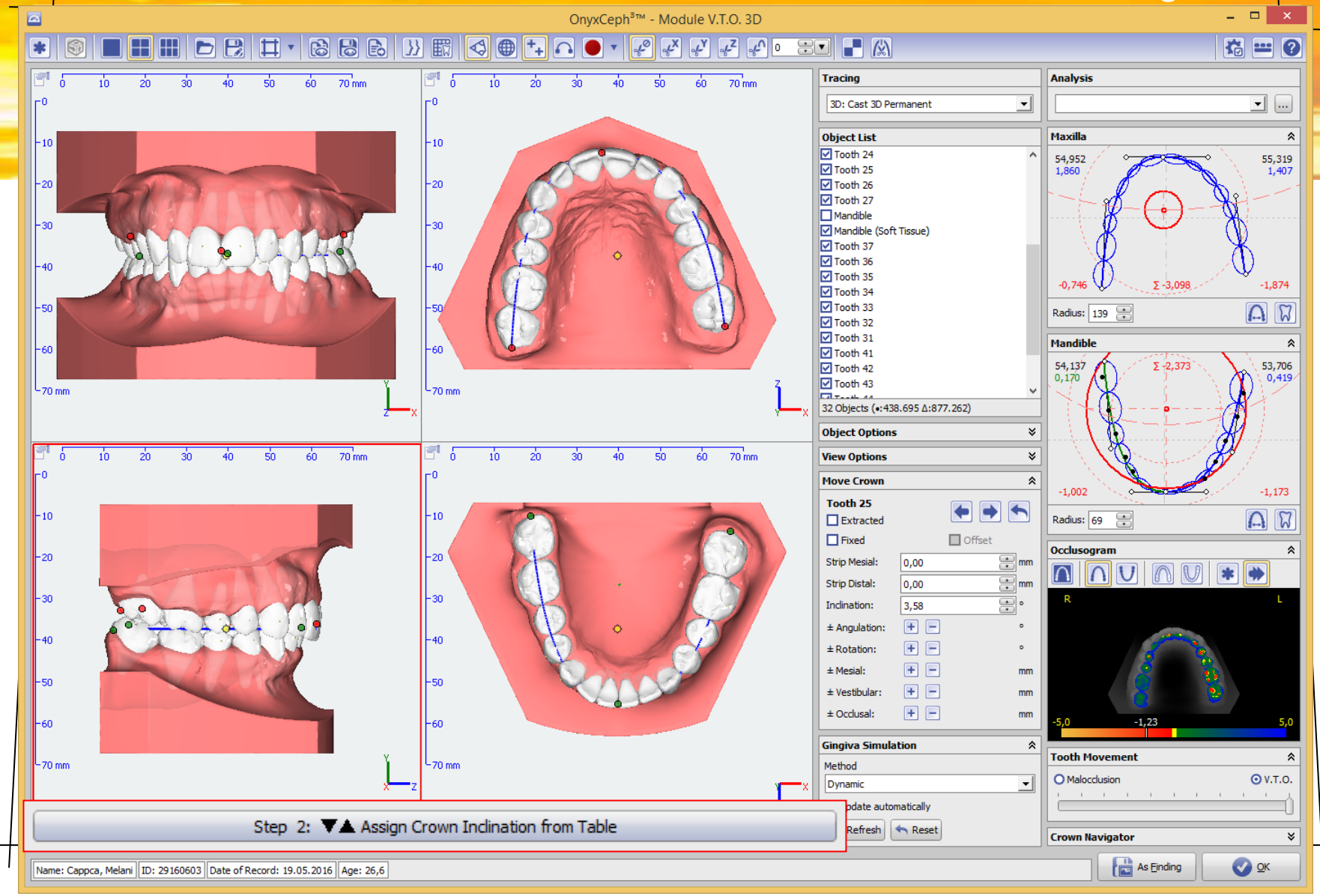


V.T.O.3D – Wizard: Step 1: ▼▲ **Align Crown with Arch**

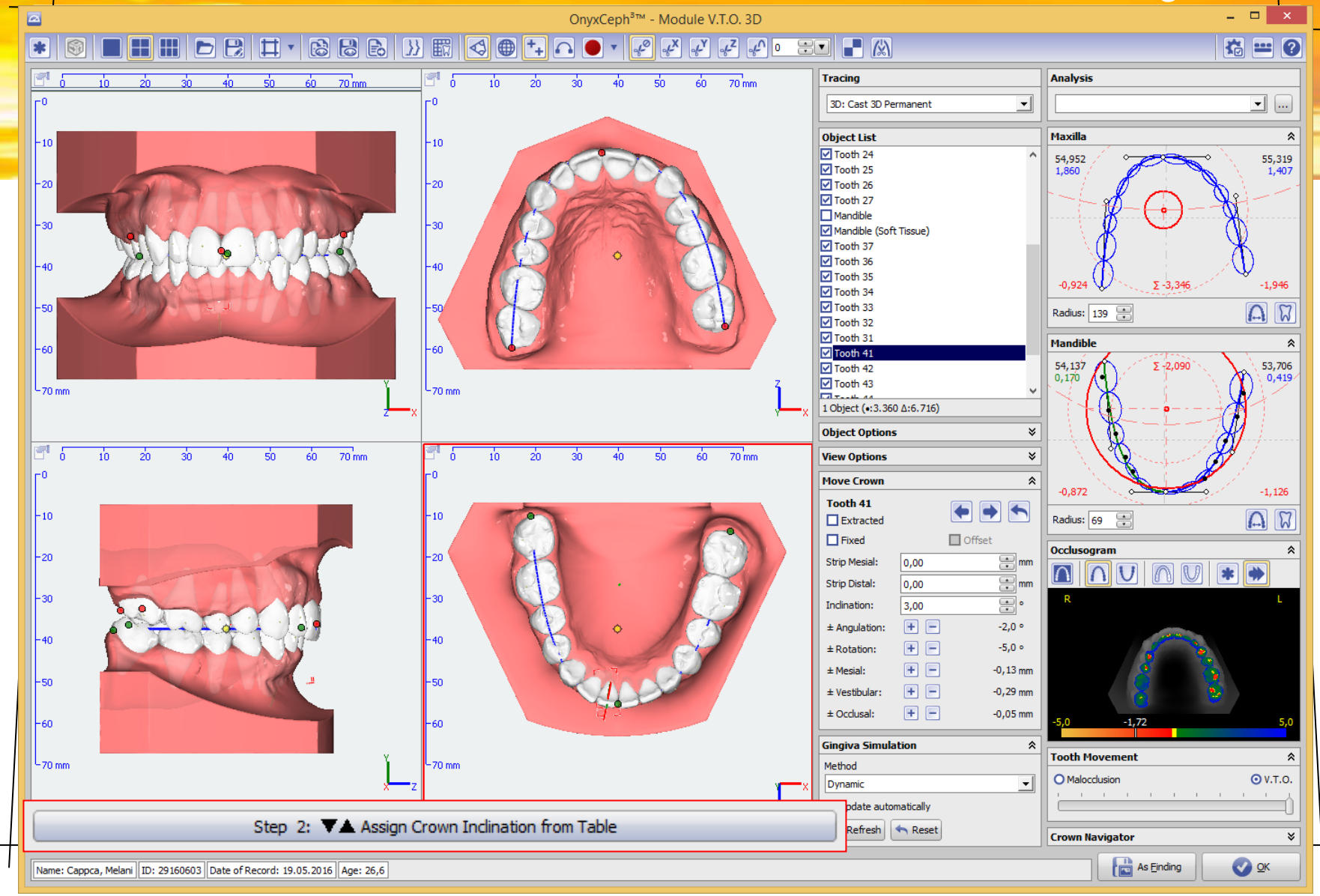


# Tooth	1	2	3	4	5	6	7	8
No Change								
Sampermans	0,0	0,0	-4,0	-10,0	-10,0	-15,0	-10,0	
Gianelli	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
Cetlin	-6,0	-6,0	-7,0	-11,0	-15,0	-25,0	-25,0	
Roncone	1,0	1,0	-3,0	-7,0	-7,0	-10,0	-10,0	
MBT	-6,0	-6,0	-6,0	-12,0	-12,0	-20,0	-10,0	
Roth	-1,0	-1,0	-11,0	-17,0	-22,0	-25,0	-30,0	
Andrews SWA	-1,0	-1,0	-11,0	-17,0	-22,0	-25,0	-30,0	

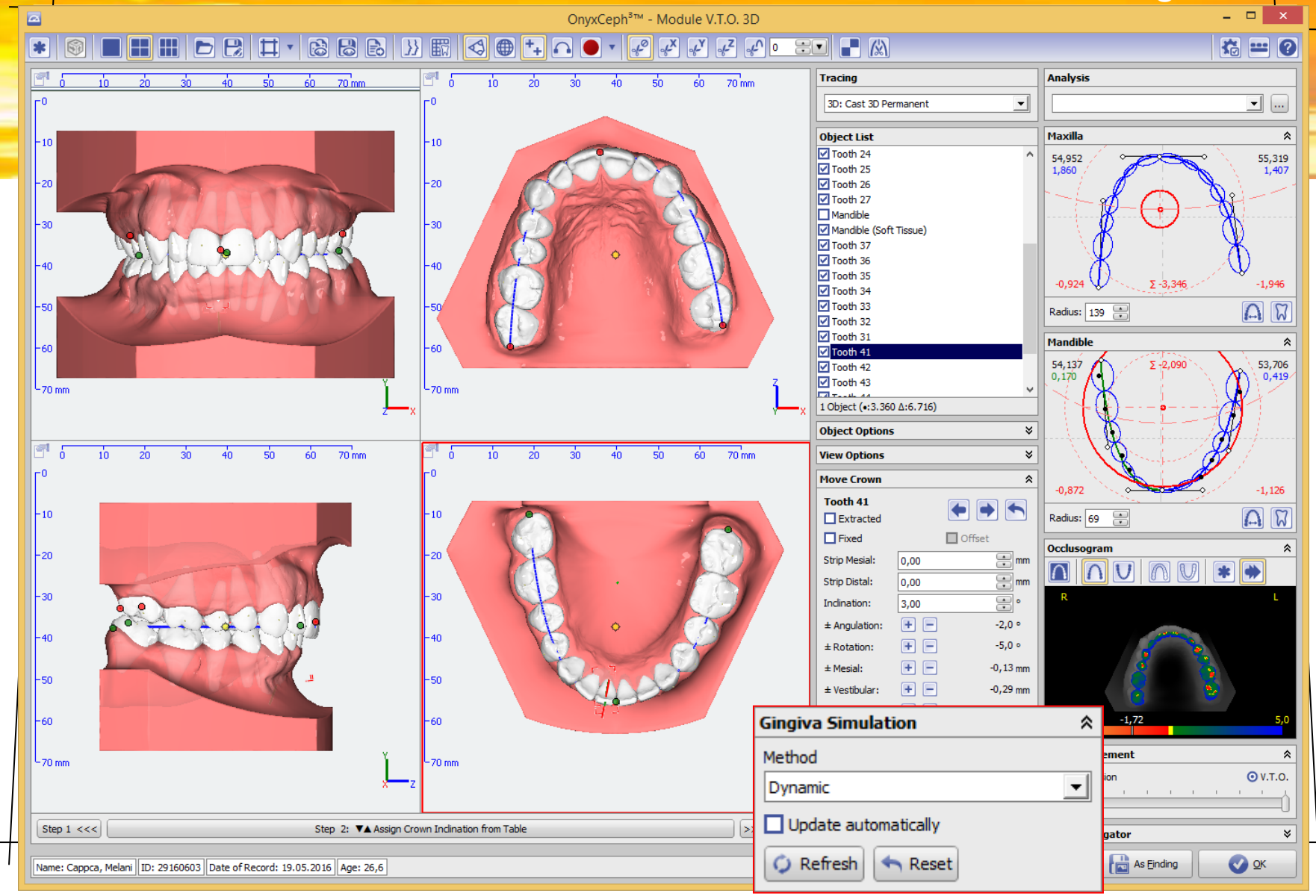
V.T.O.3D – Wizard: Step 2 : ▼▲ **Assign Crown Inclination from Table**



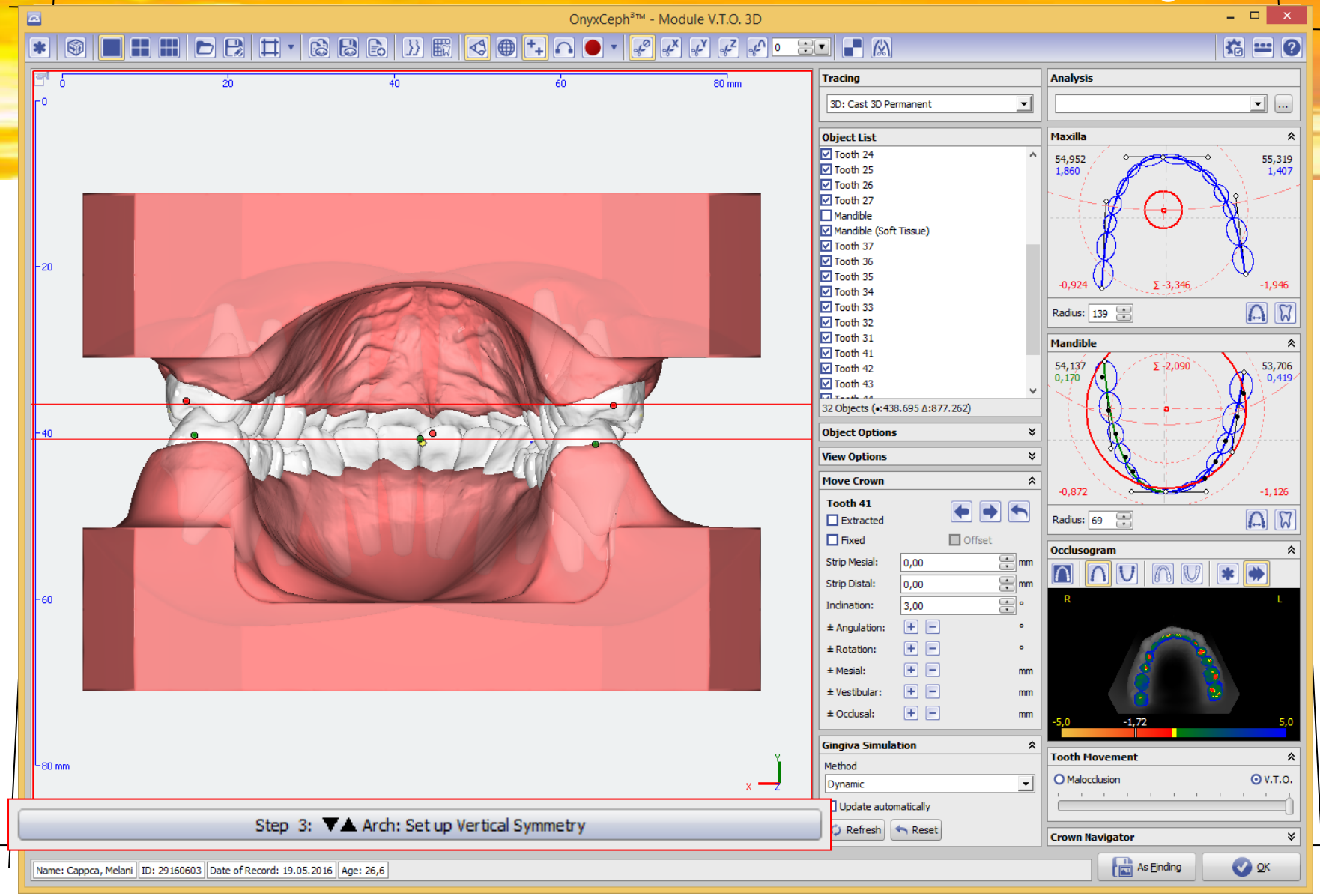
V.T.O.3D – Wizard: Step 2 : ▼▲ **Assign Crown Inclination from Table**



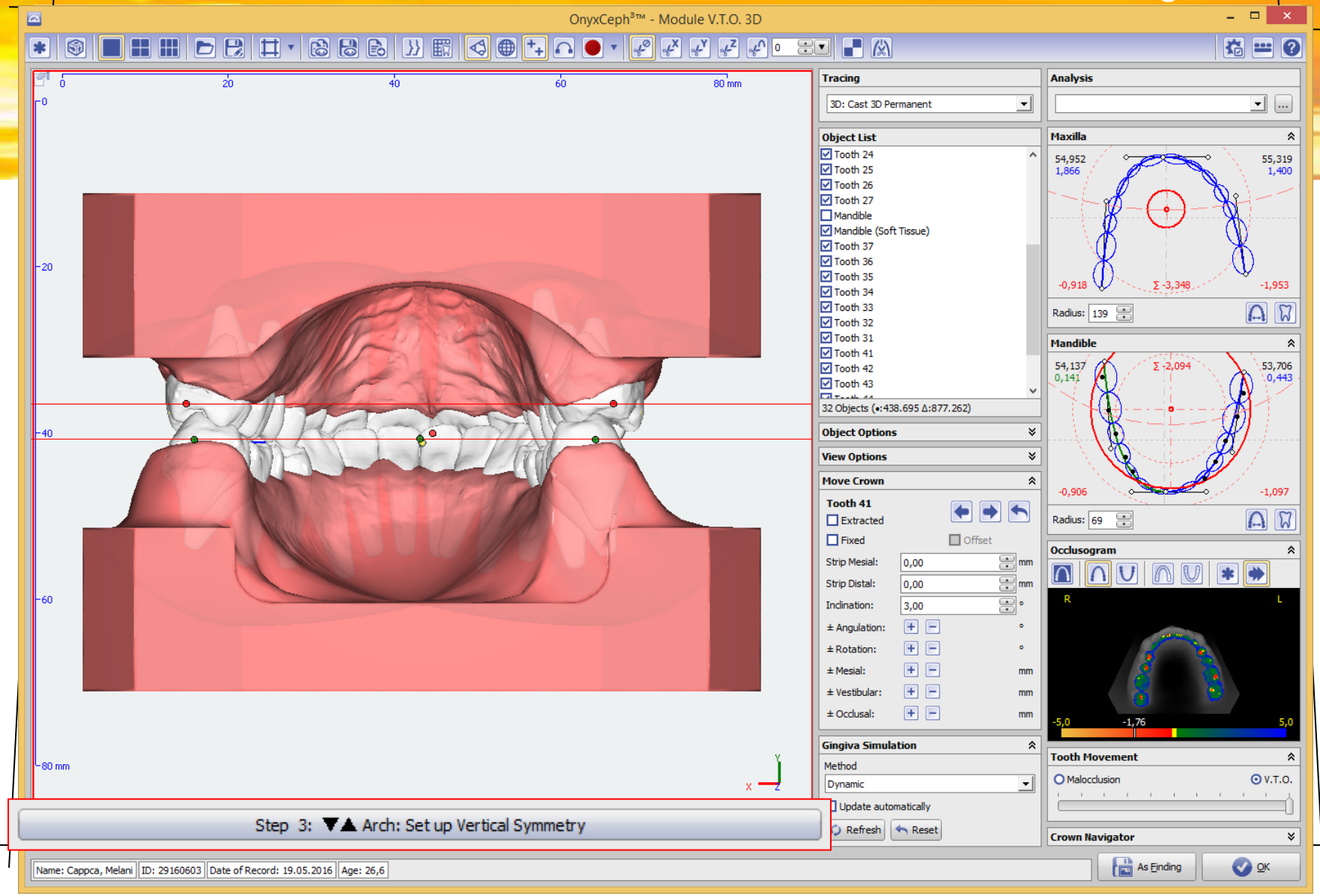
V.T.O.3D – Wizard: Step 2 : ▼▲ **Assign Crown Inclination from Table**



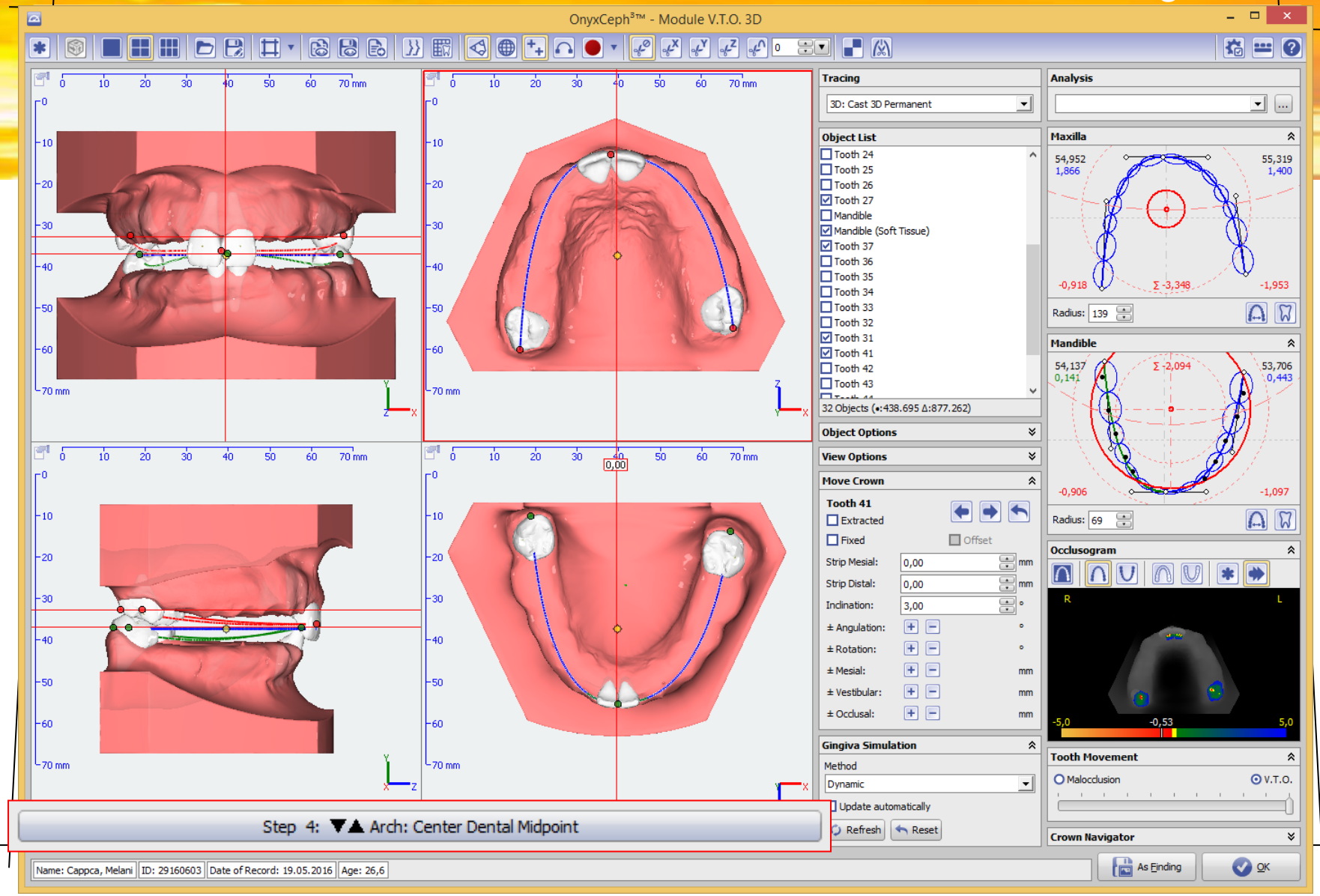
V.T.O.3D – Wizard: **Gingiva Simulation**



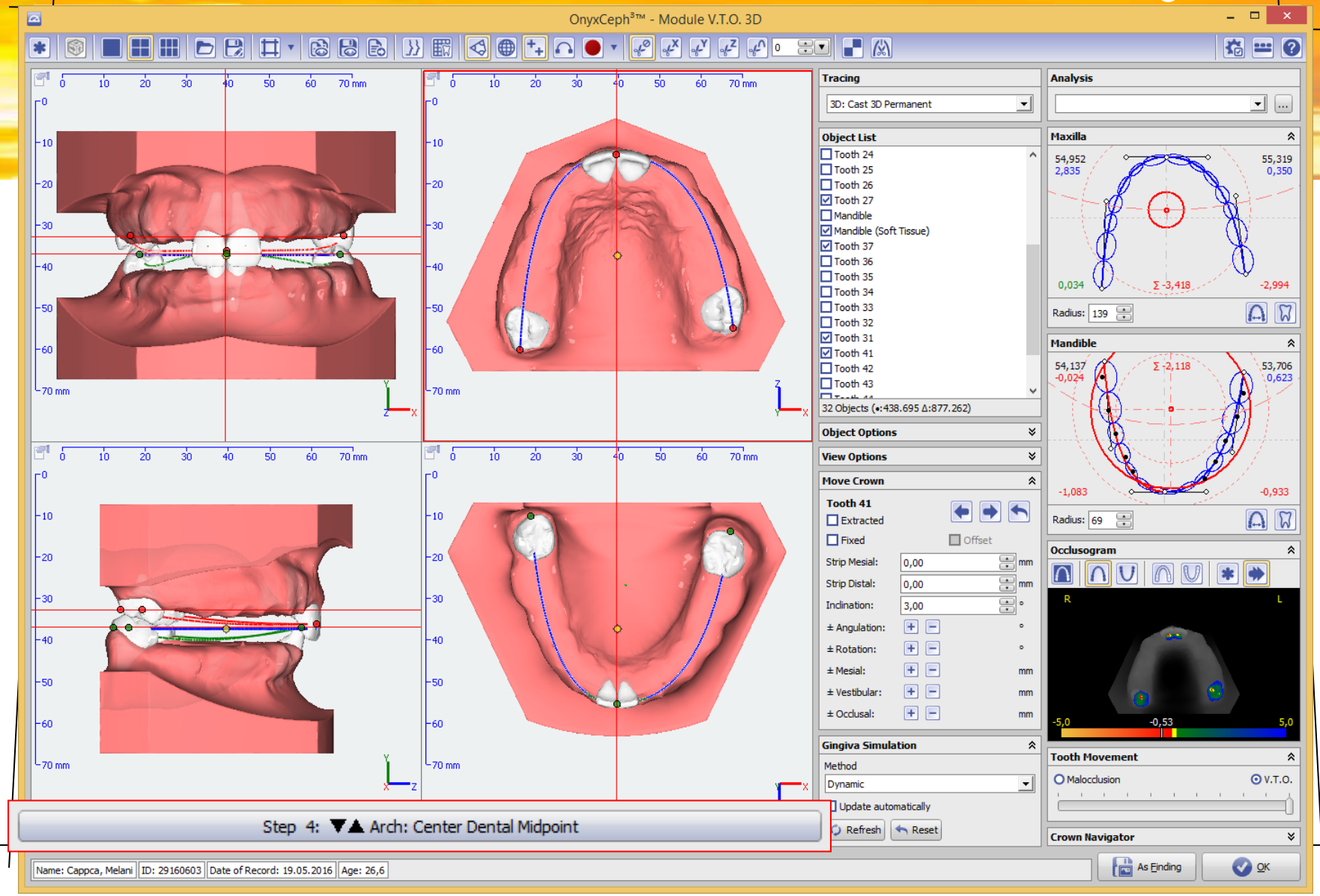
V.T.O.3D – Wizard: Step 3 : ▼▲ **Arch: Set up Vertical Symmetry**



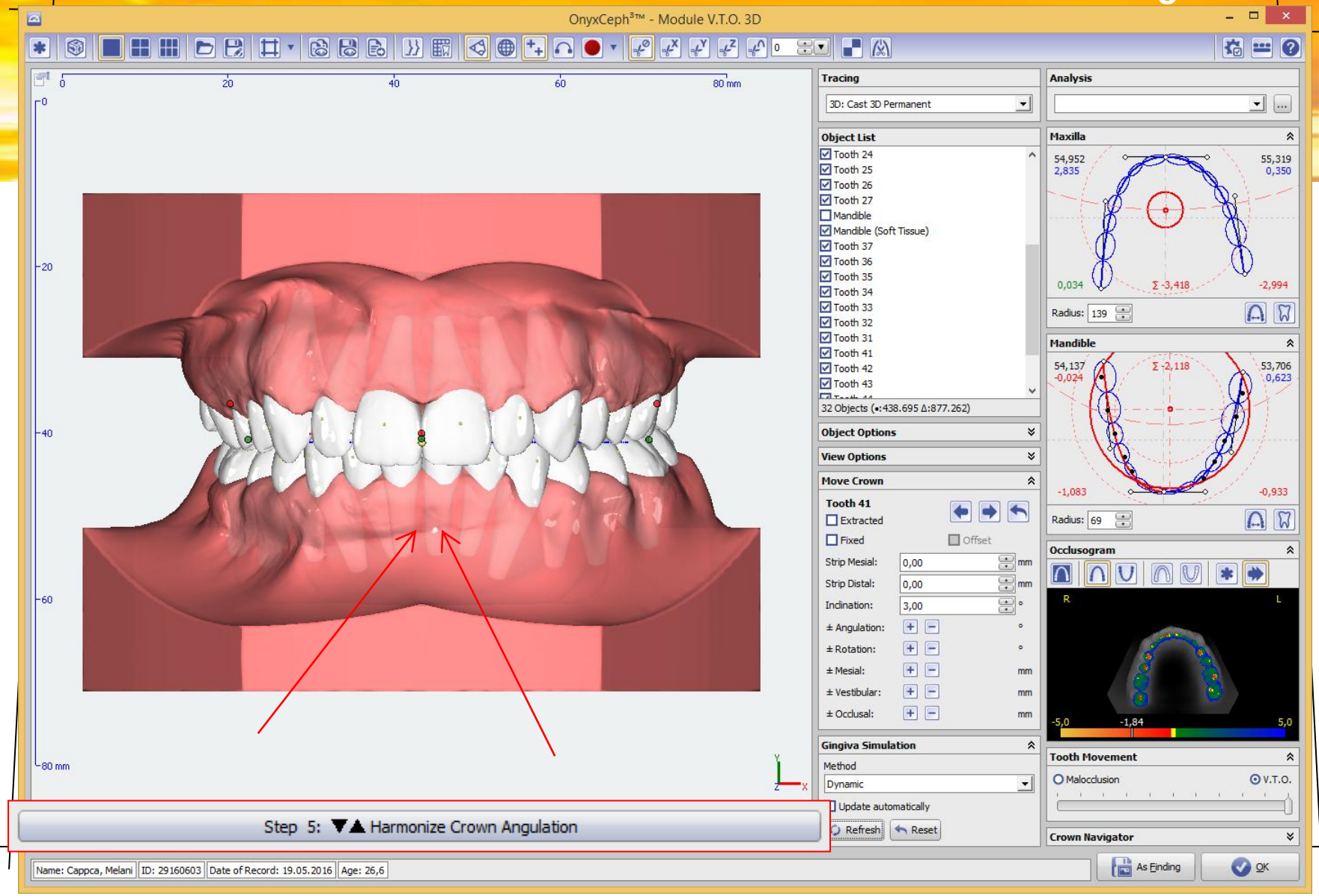
V.T.O.3D – Wizard: Step 3 : ▼▲ **Arch: Set up Vertical Symmetry**



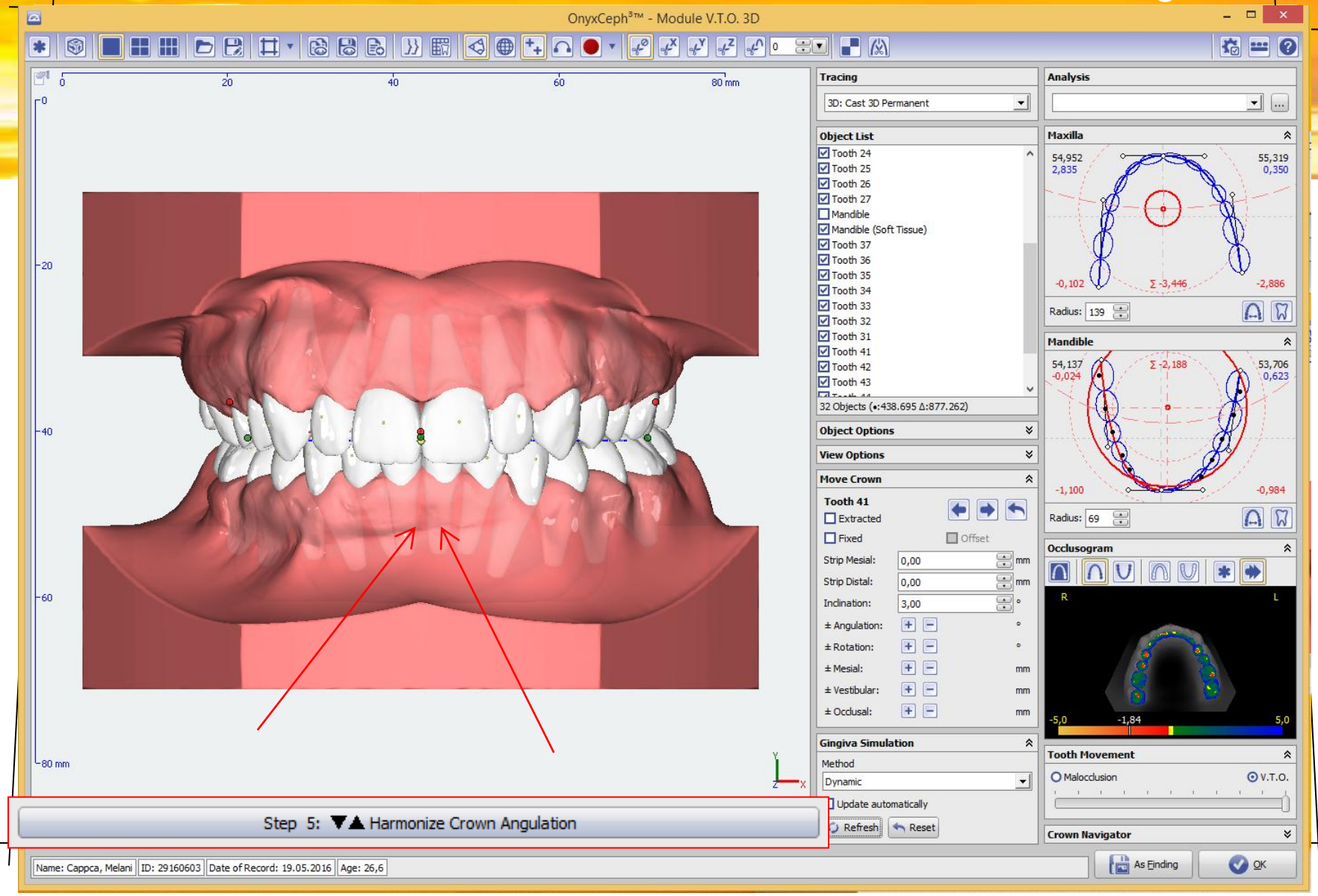
V.T.O.3D – Wizard: Step 4 : ▼▲ **Arch: Center Dental Midpoint**



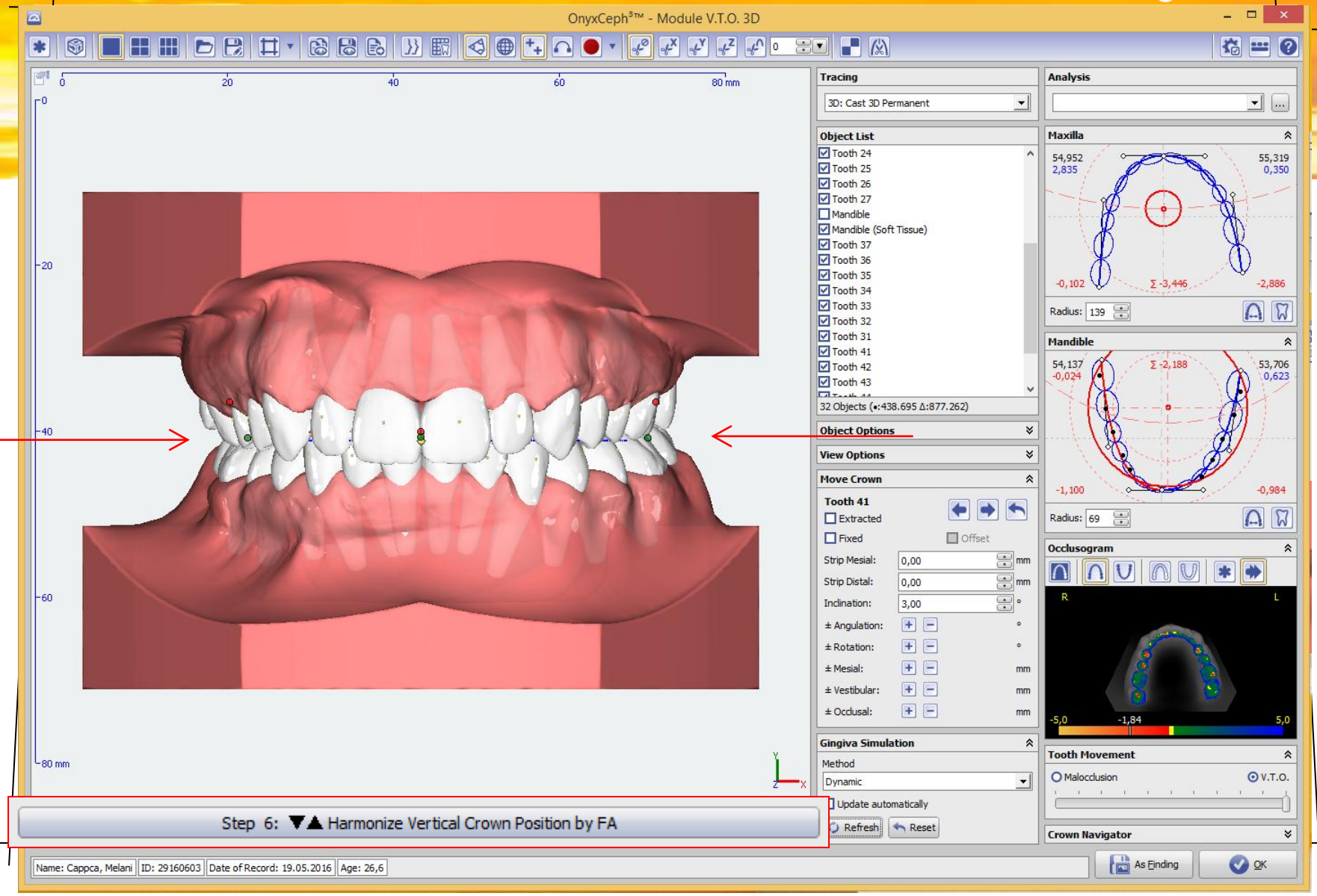
V.T.O.3D – Wizard: Step 4 : ▼▲ **Arch: Center Dental Midpoint**



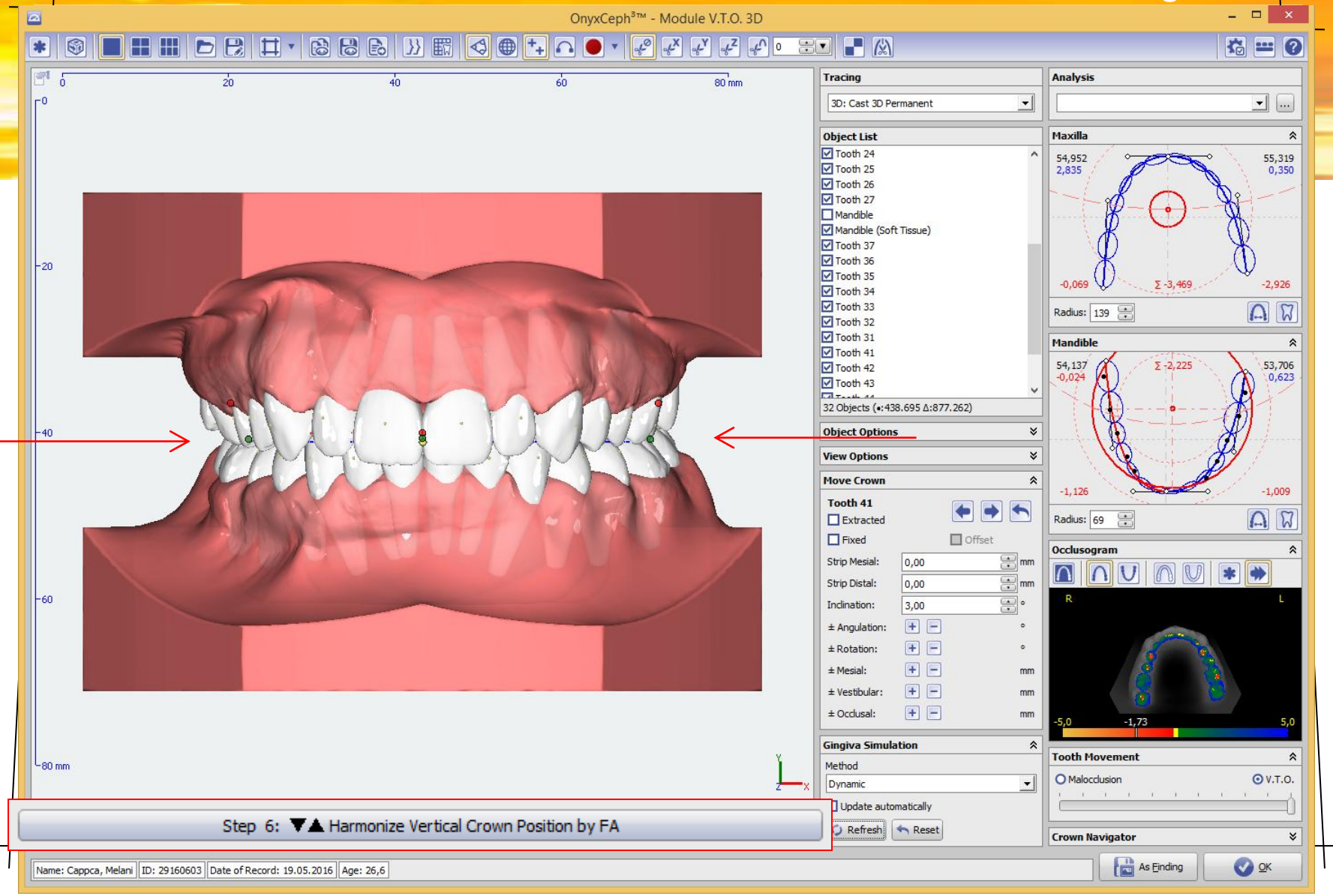
V.T.O.3D – Wizard: Step 5 : ▼▲ **Harmonize Crown Angulation**



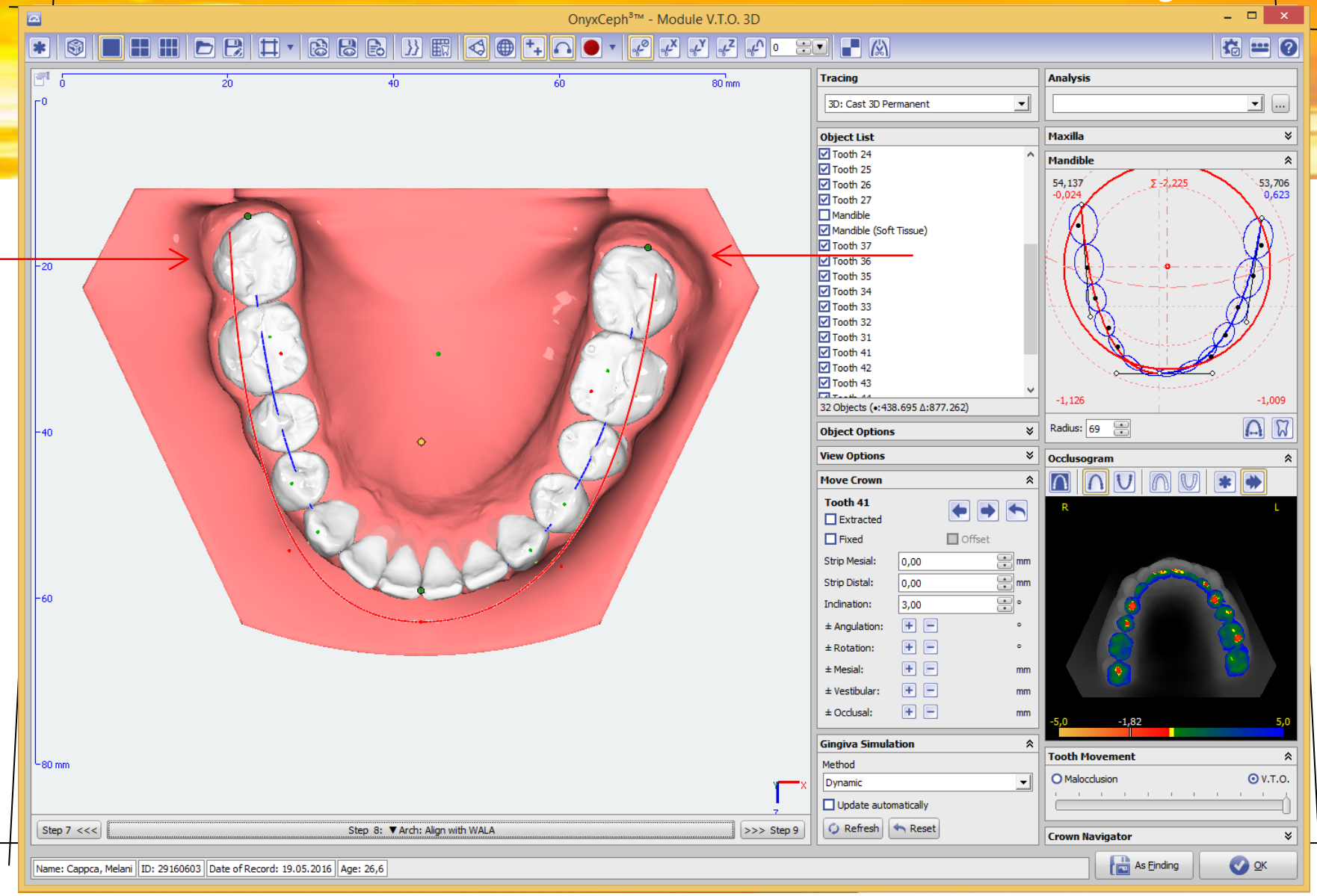
V.T.O.3D – Wizard: Step 5 : ▼▲ **Harmonize Crown Angulation**



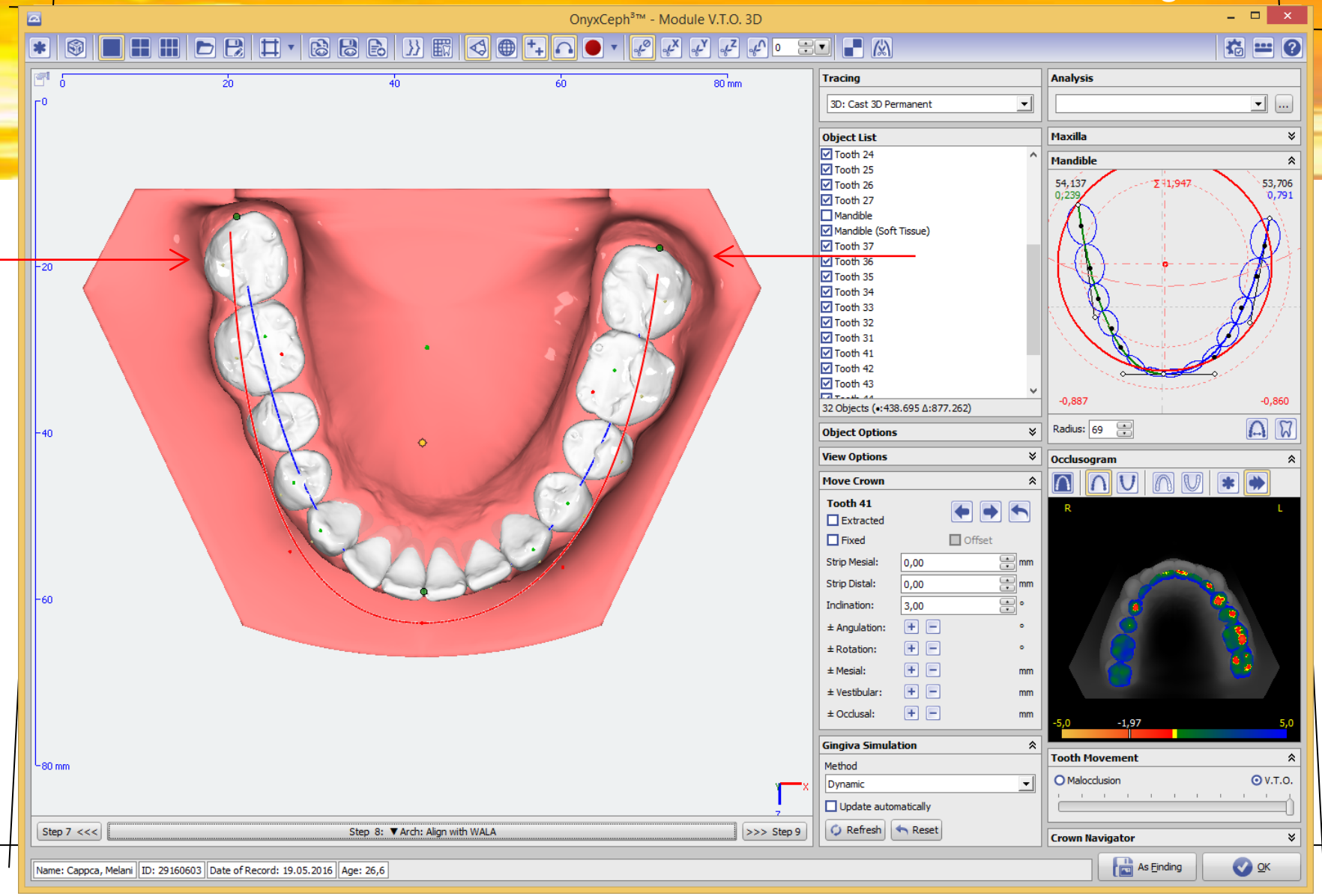
V.T.O.3D – Wizard: Step 6 : ▼▲ **Harmonize Vertical Crown Position by FA**



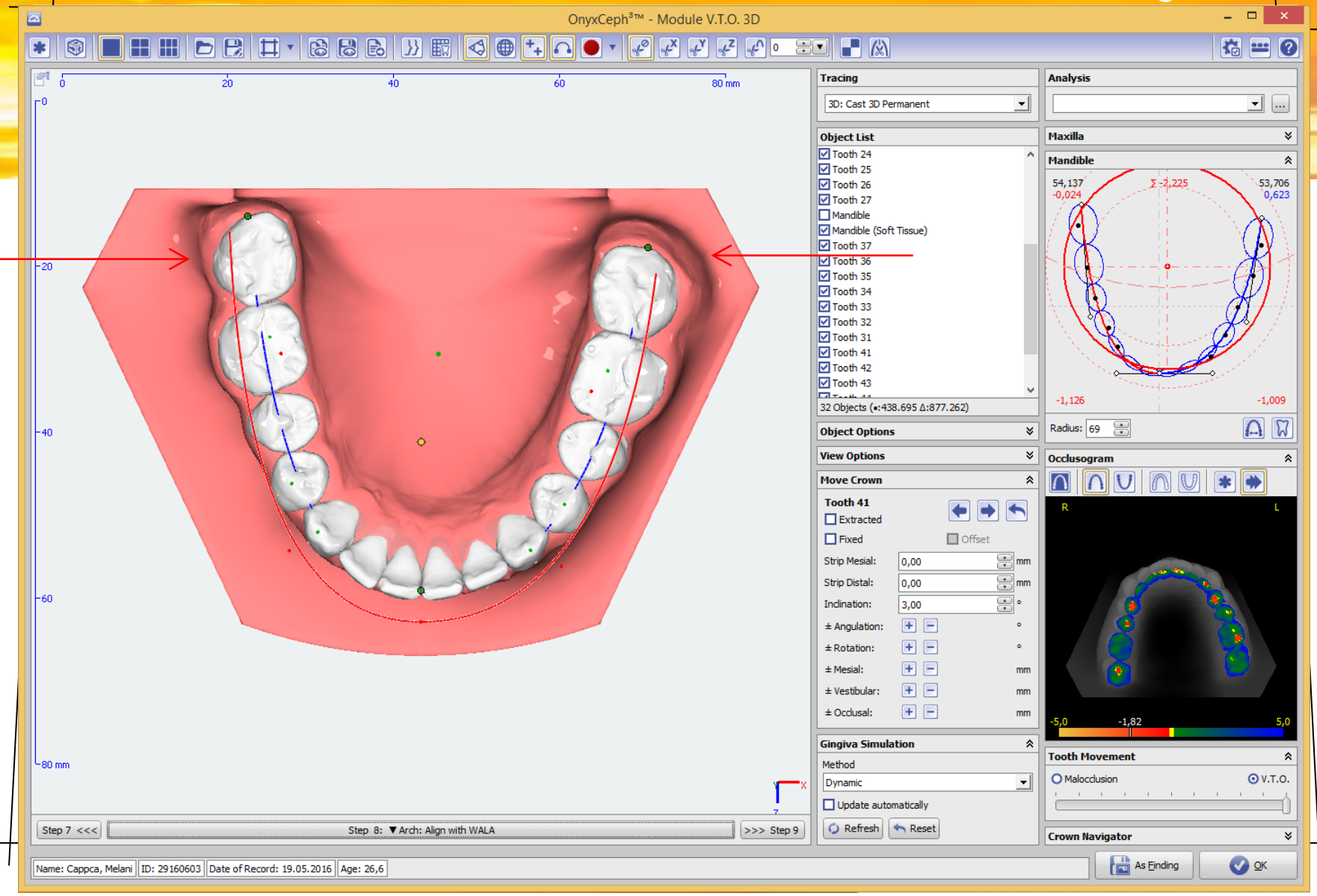
V.T.O.3D – Wizard: Step 6 : ▼▲ **Harmonize Vertical Crown Position by FA**



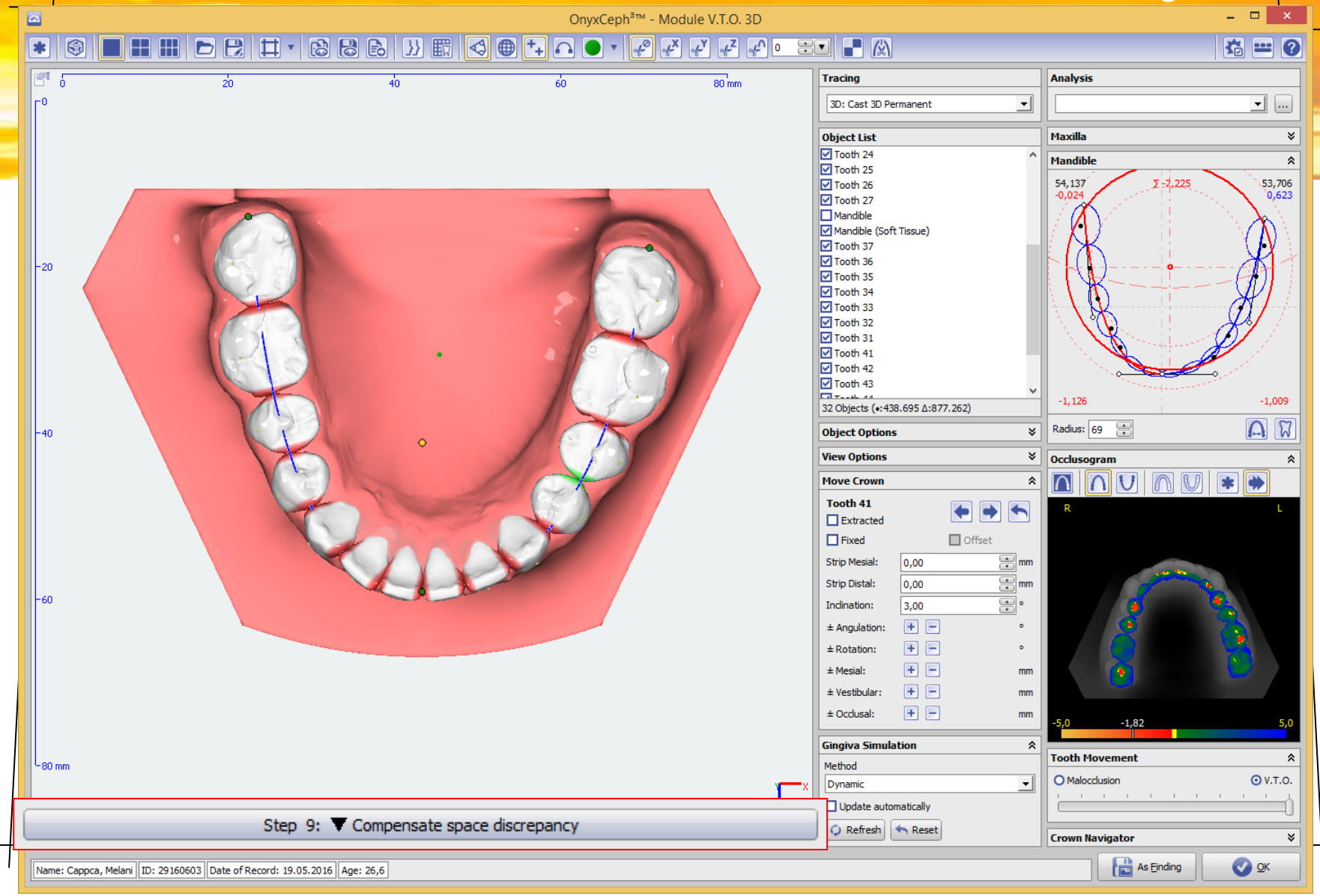
V.T.O.3D – Wizard: Step 8 : ▼ **Arch: Align with WALA**



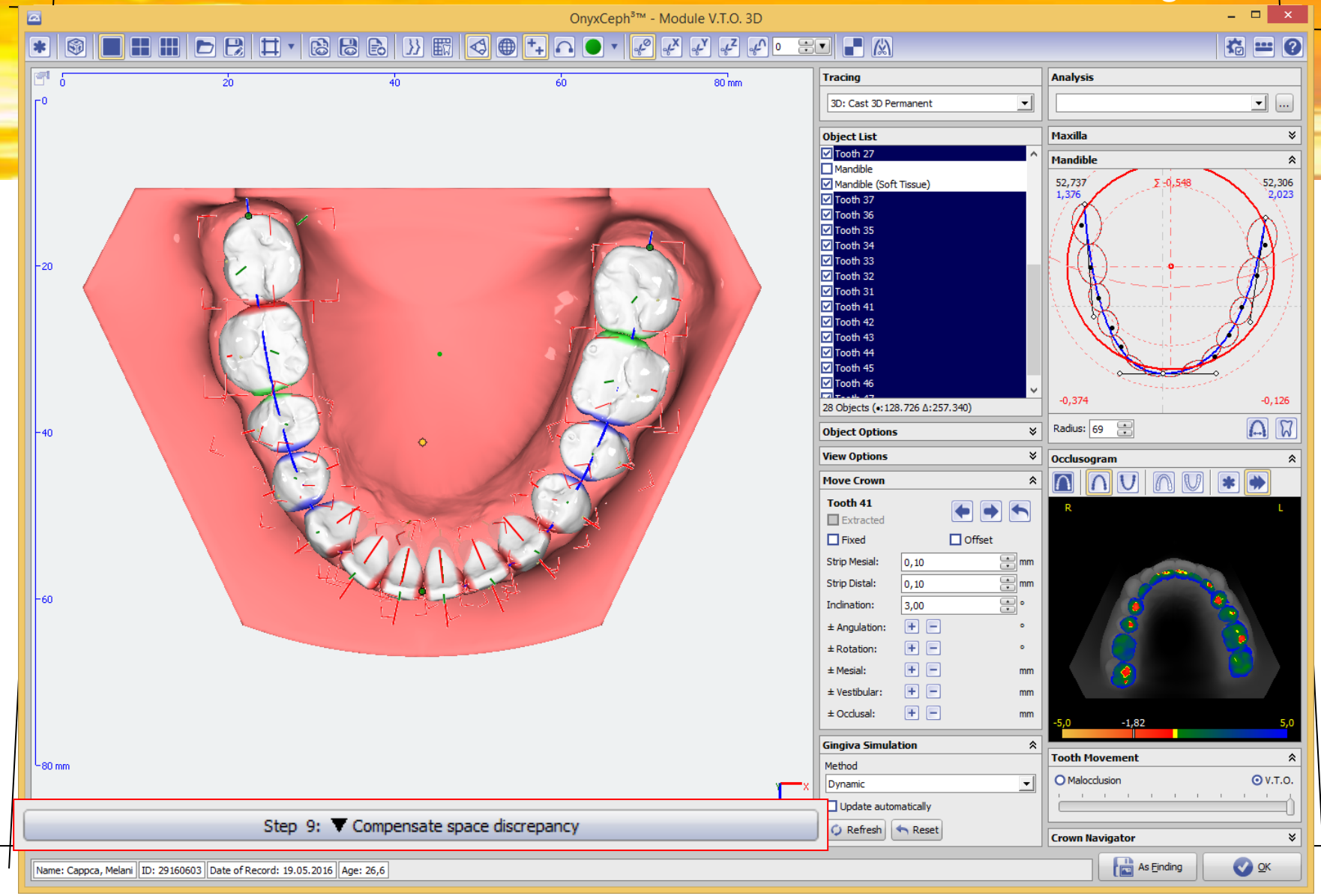
V.T.O.3D – Wizard: Step 8 : ▼ **Arch: Align with WALA**



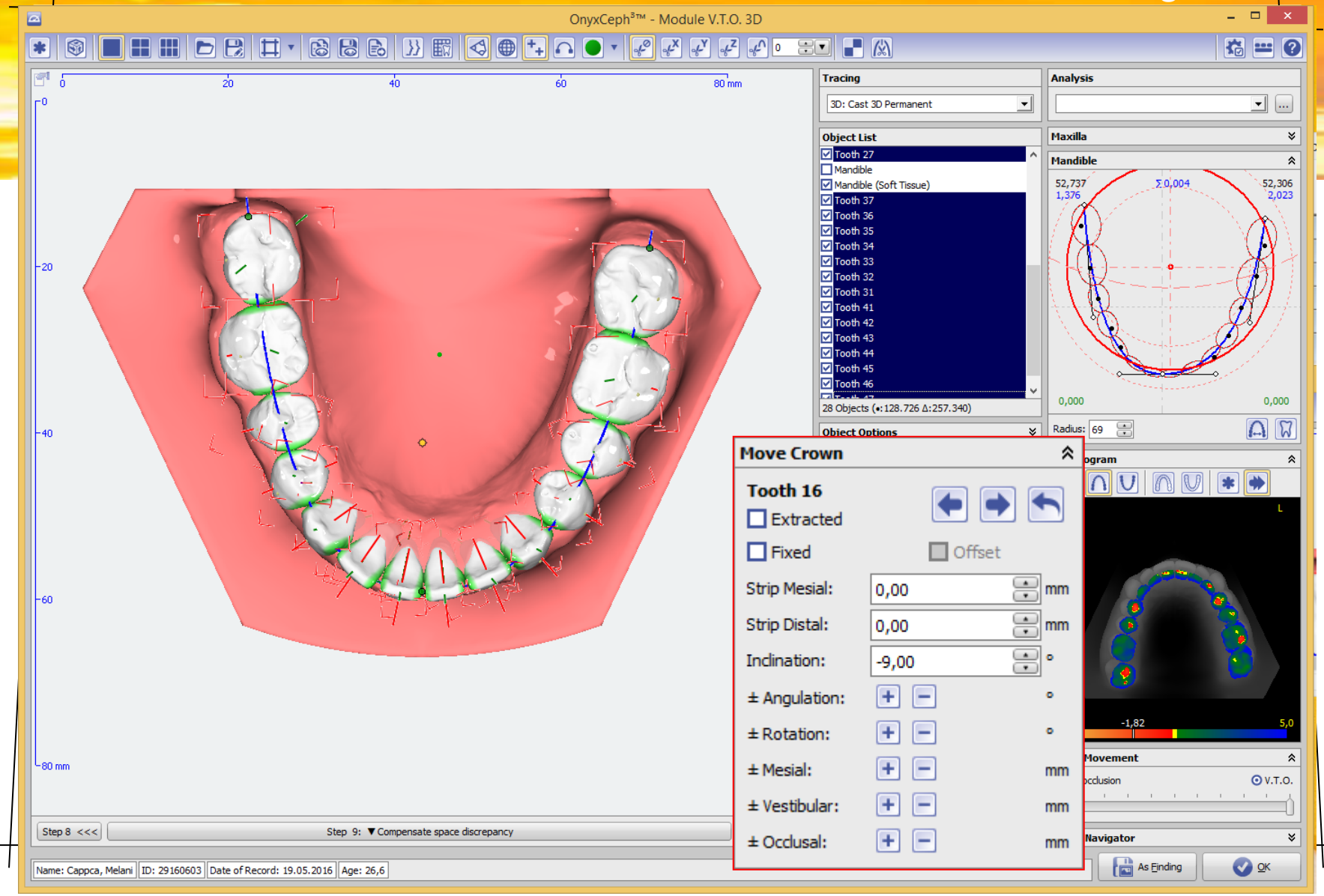
V.T.O.3D – Wizard: Step 8 : ▼ **Arch: Align with WALA**



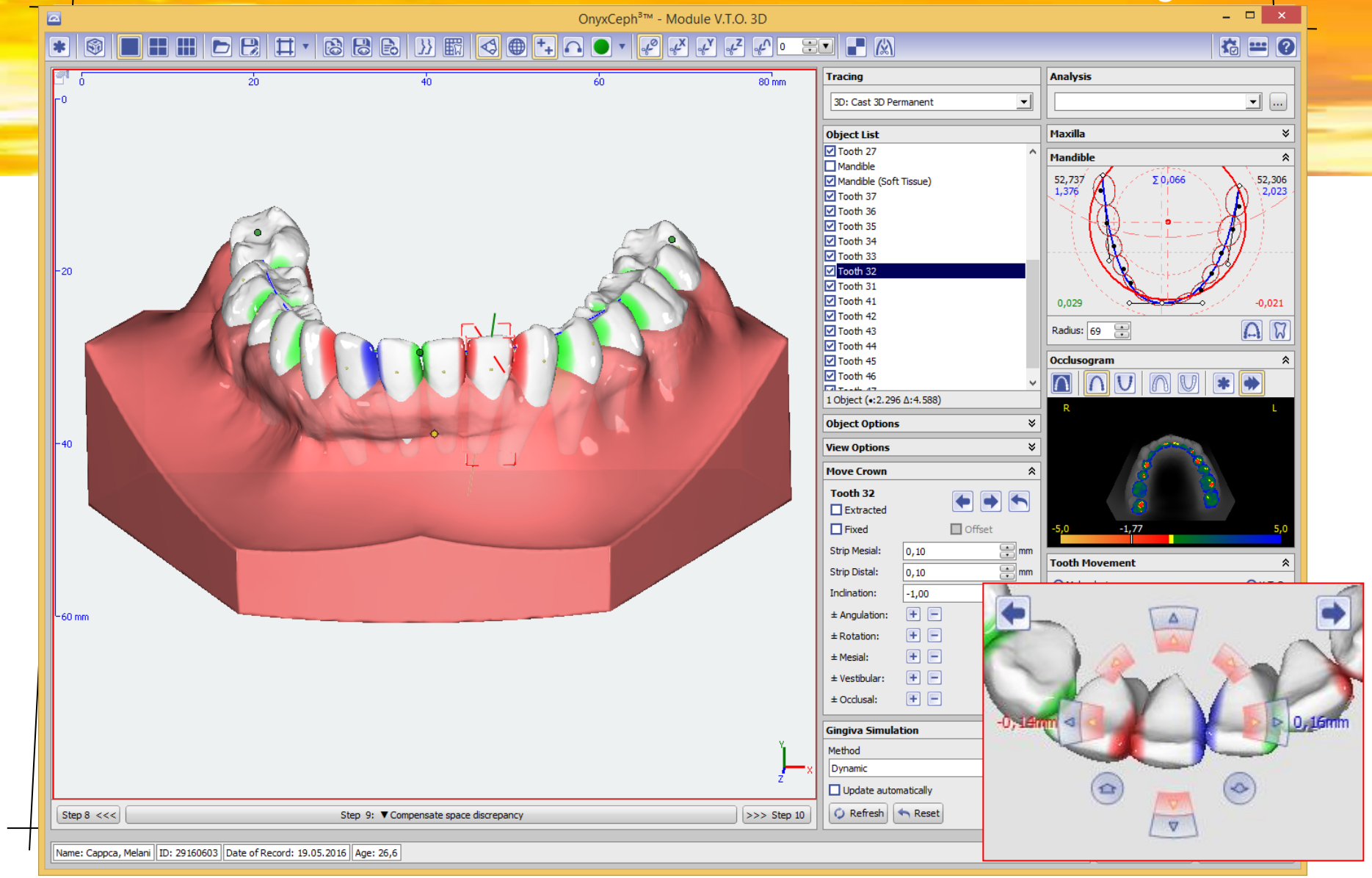
V.T.O.3D – Wizard: Step 9 : ▼**Compensate Space Discrepancy + Manual Control**



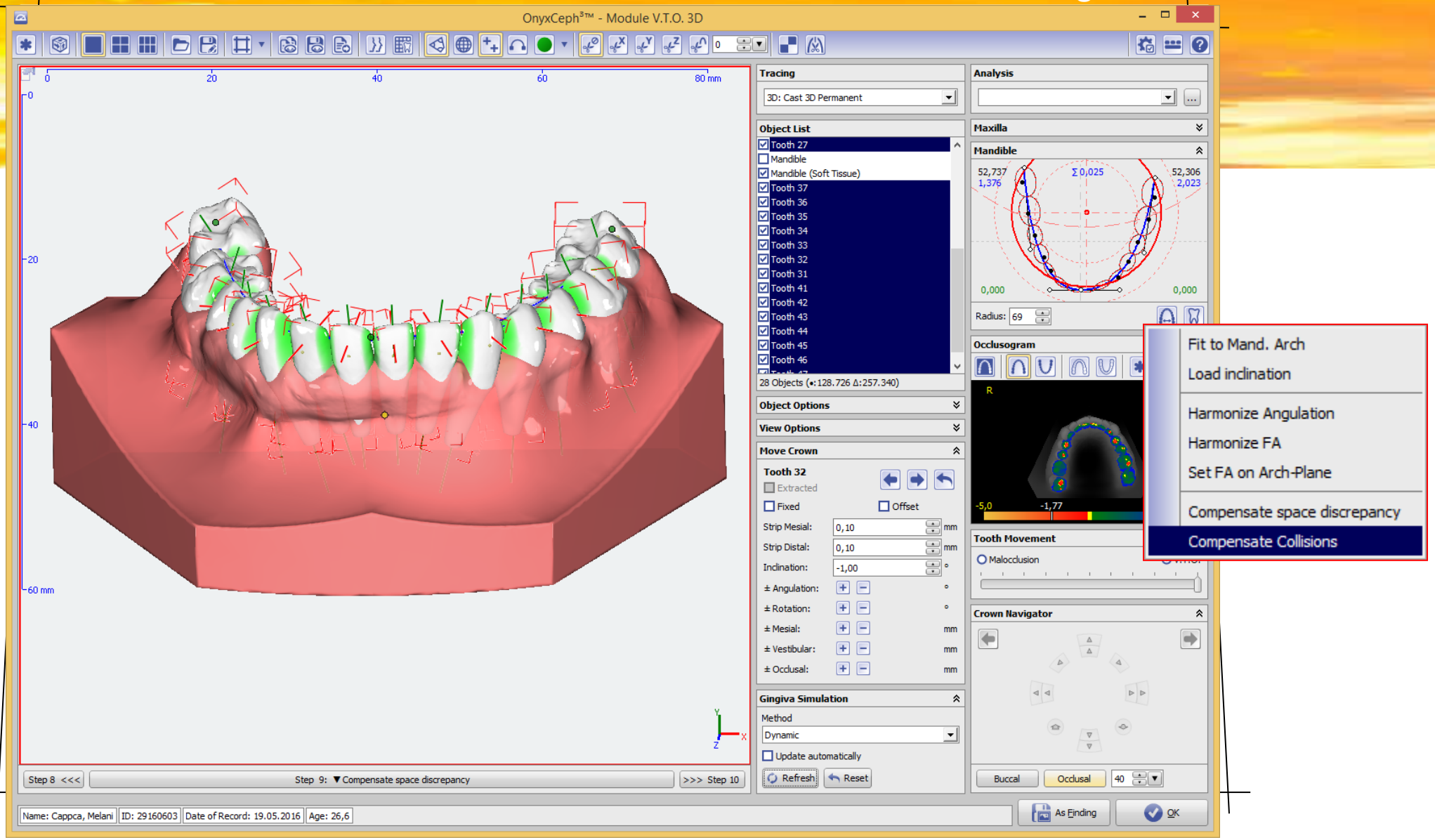
V.T.O.3D – Wizard: Step 9 : ▼**Compensate Space Discrepancy + Manual Control**



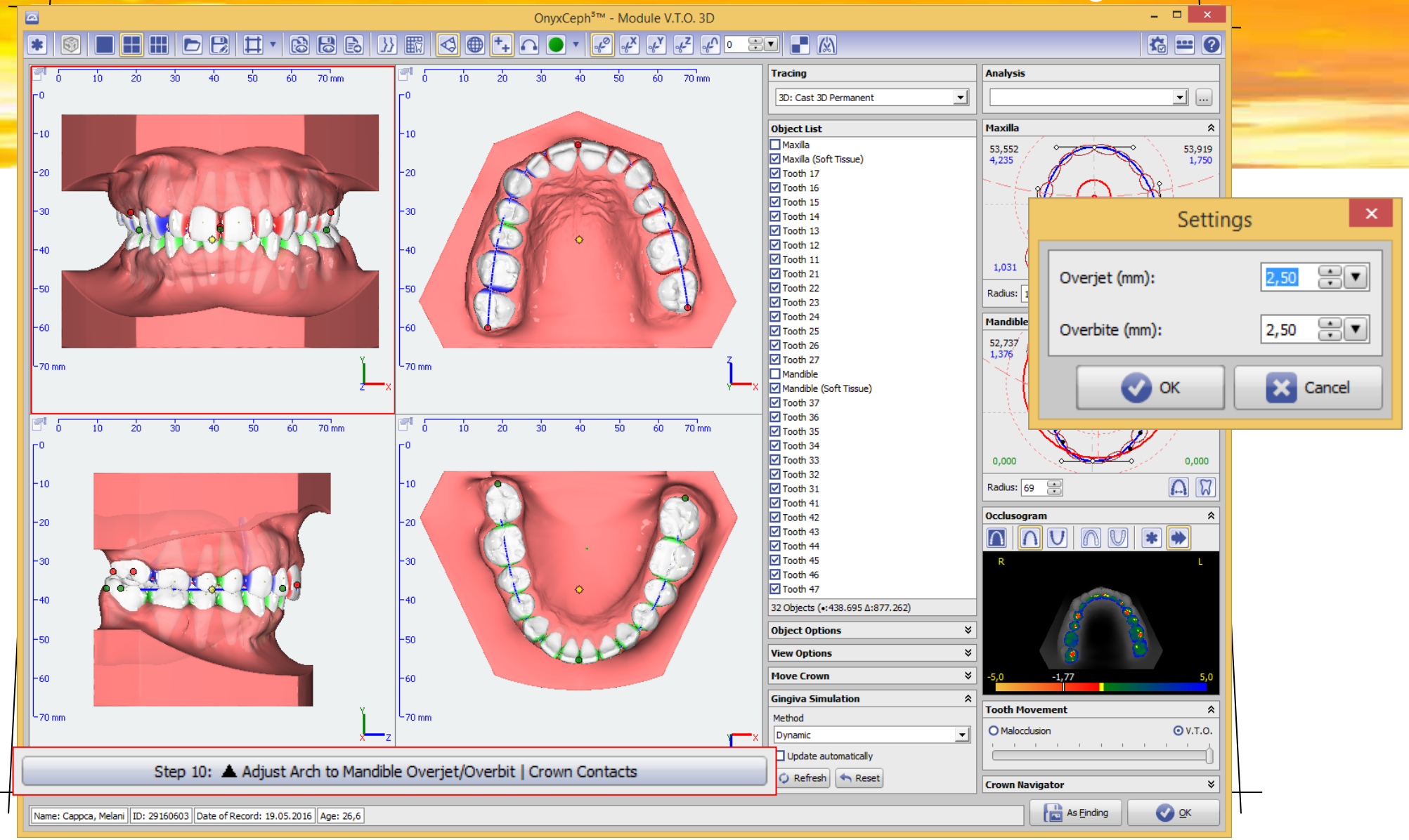
V.T.O.3D – Wizard: Step 9 : ▼**Compensate Space Discrepancy + Manual Control**



V.T.O.3D – Wizard: Step 9 : ▼**Compensate Space Discrepancy + Manual Control**



V.T.O.3D – Wizard: Step 9 : ▼**Compensate Space Discrepancy + Manual Control**



V.T.O.3D – Wizard: Step 10 : ▲ **Adjust Arch to Mandible Overjet/Overbite | Crown Contacts**

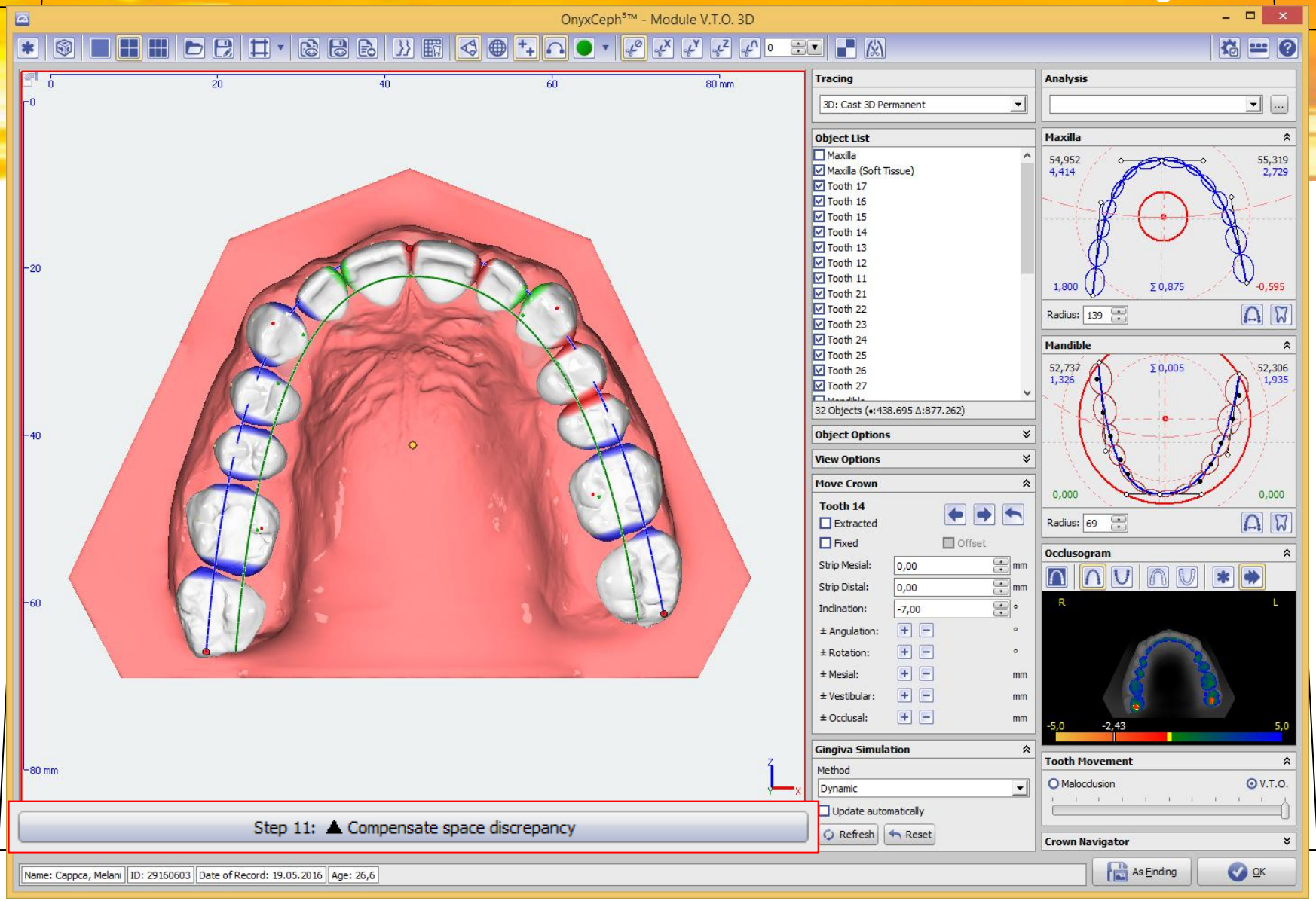
OnyxCeph³™ - Module V.T.O. 3D

Step 10: ▲ Adjust Arch to Mandible Overjet/Overbit | Crown Contacts

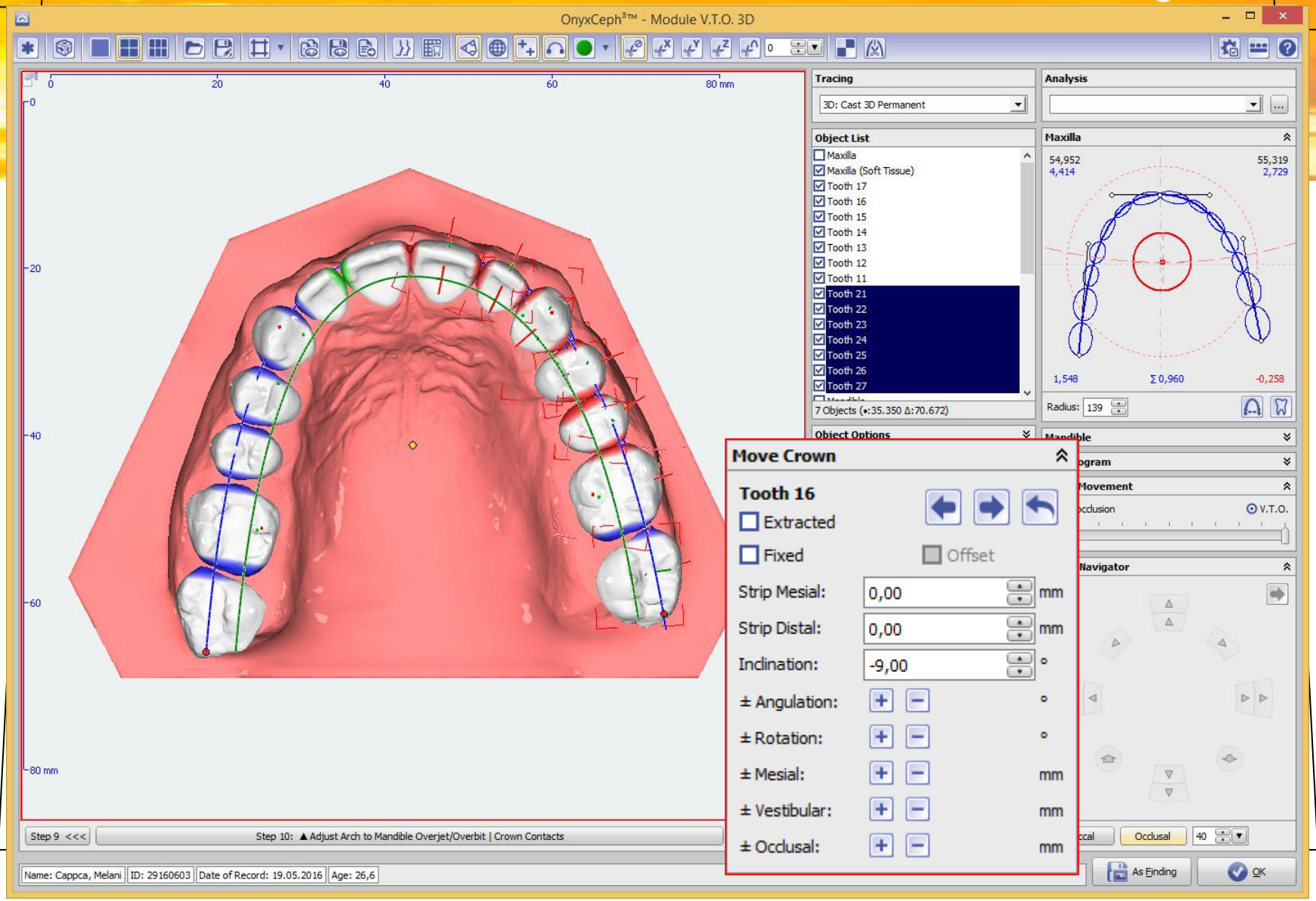
Name: Cappca, Melani | ID: 29160603 | Date of Record: 19.05.2016 | Age: 26,6

As Finding | OK

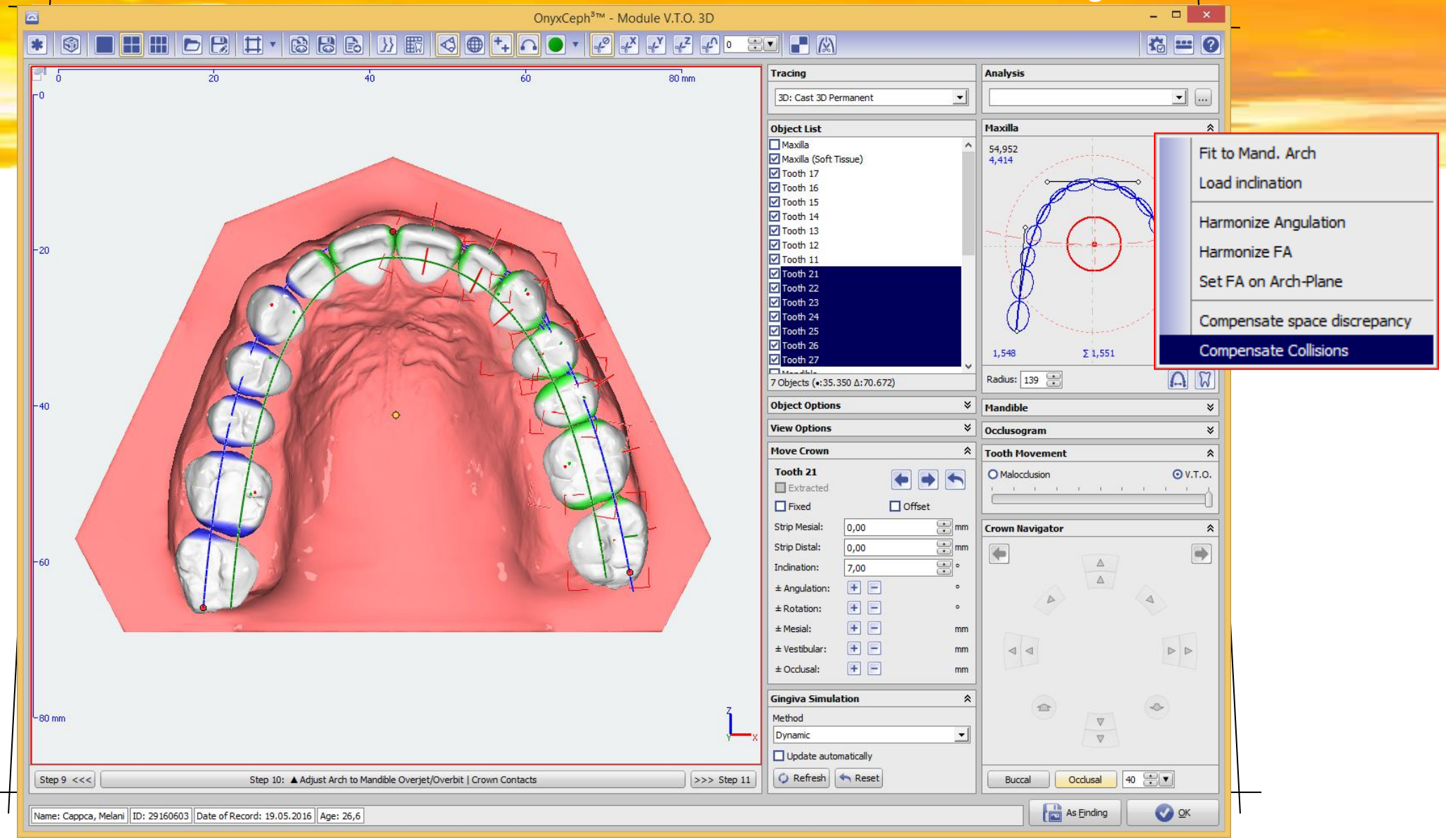
V.T.O.3D – Wizard: Step 10 : ▲ **Adjust Arch to Mandible Overjet/Overbite | Crown Contacts**



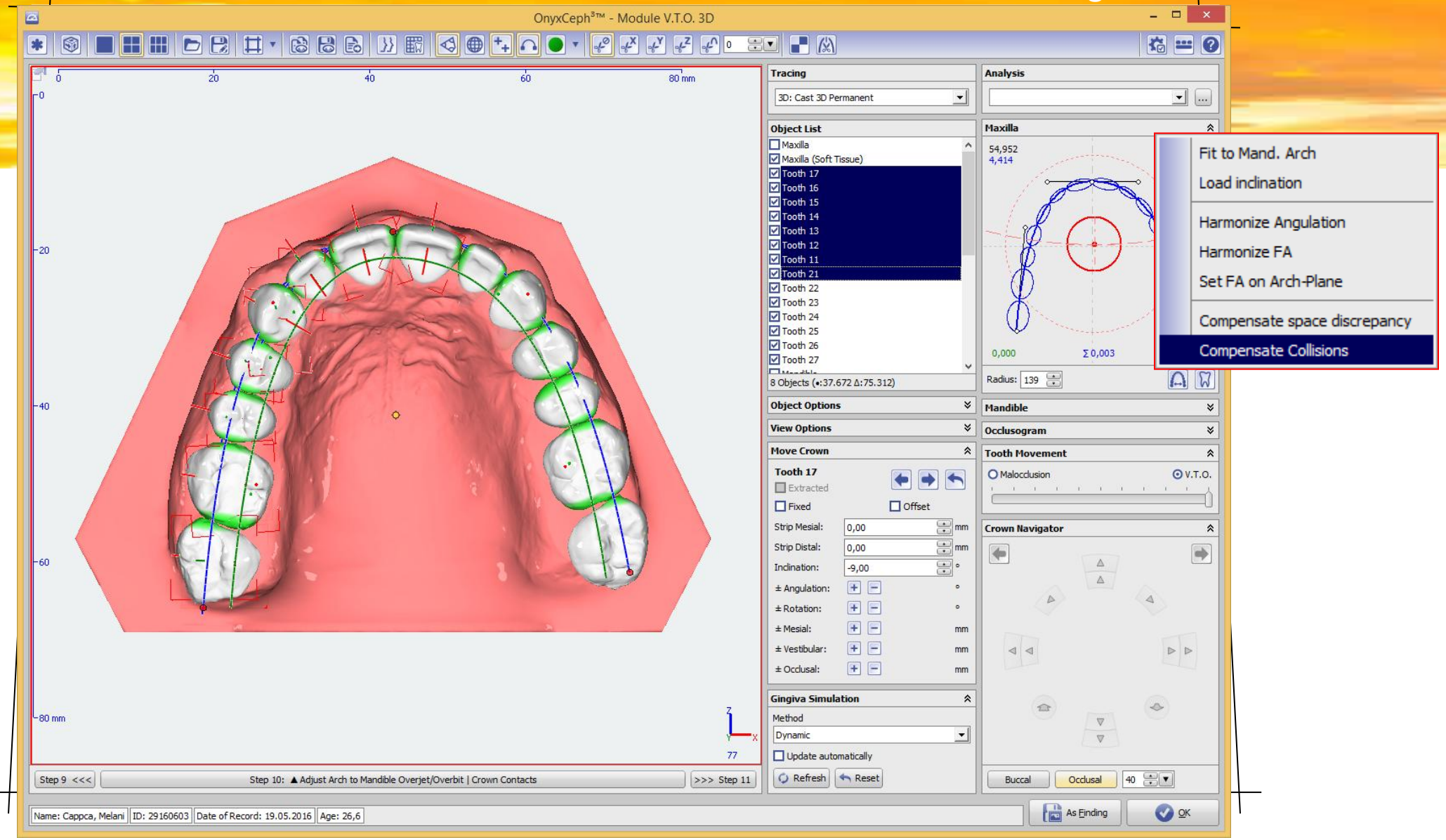
V.T.O.3D – Wizard: Step 11 : ▲ **Compensate Space Discrepancy + Manual Control**



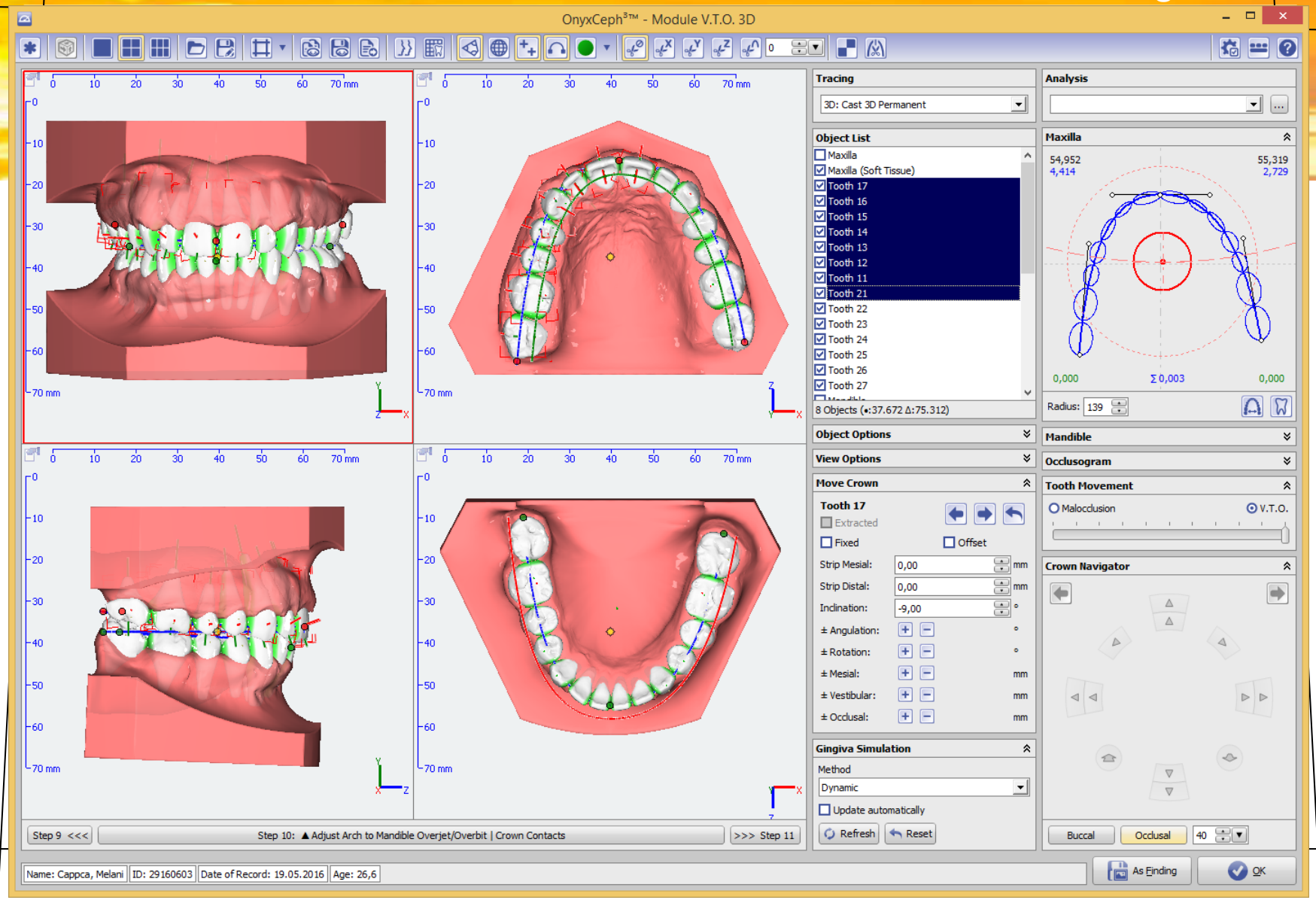
V.T.O.3D – Wizard: Step 11 : ▲ **Compensate Space Discrepancy + Manual Control**



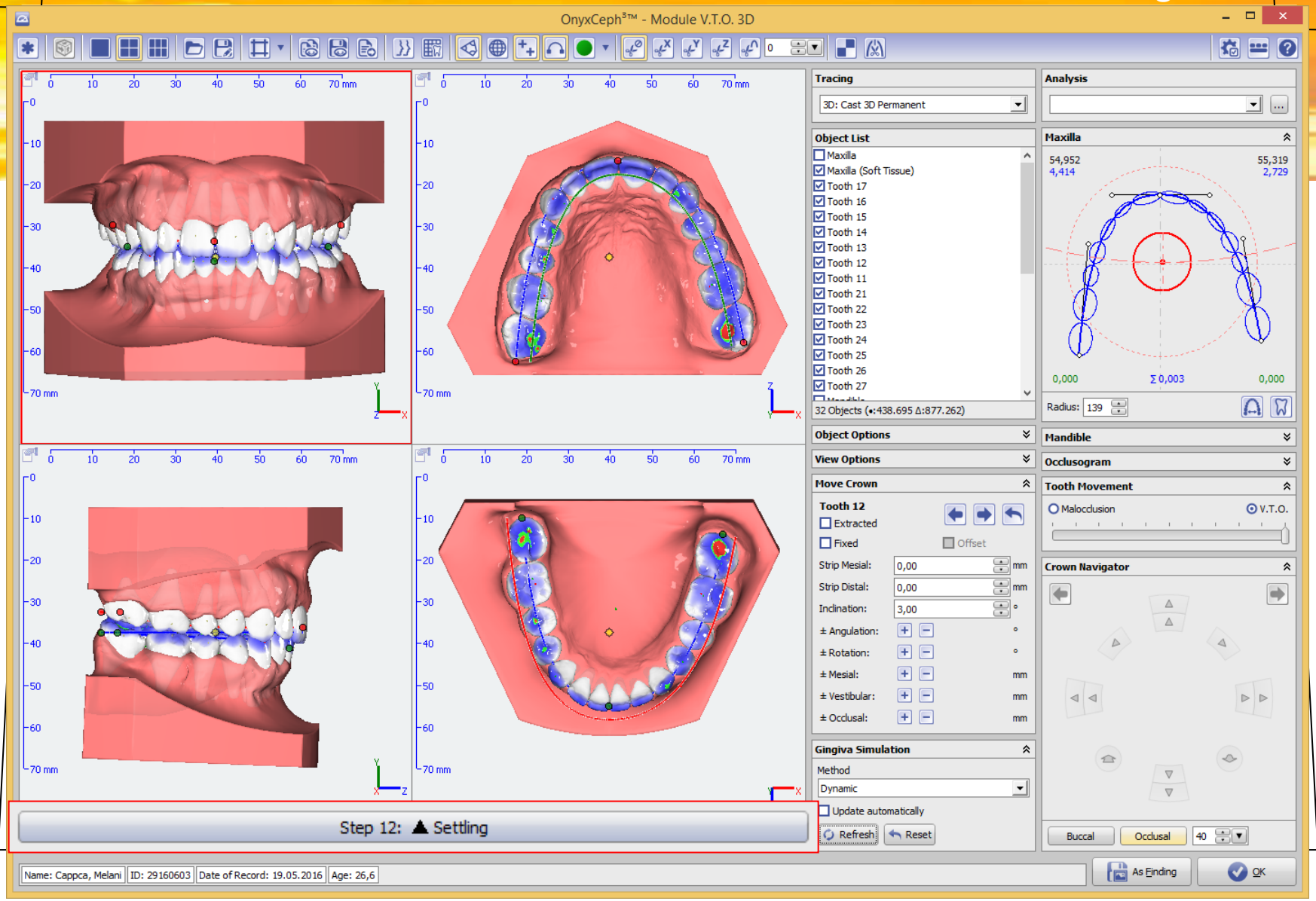
V.T.O.3D – Wizard: Step 11 : ▲ **Compensate Space Discrepancy + Manual Control**



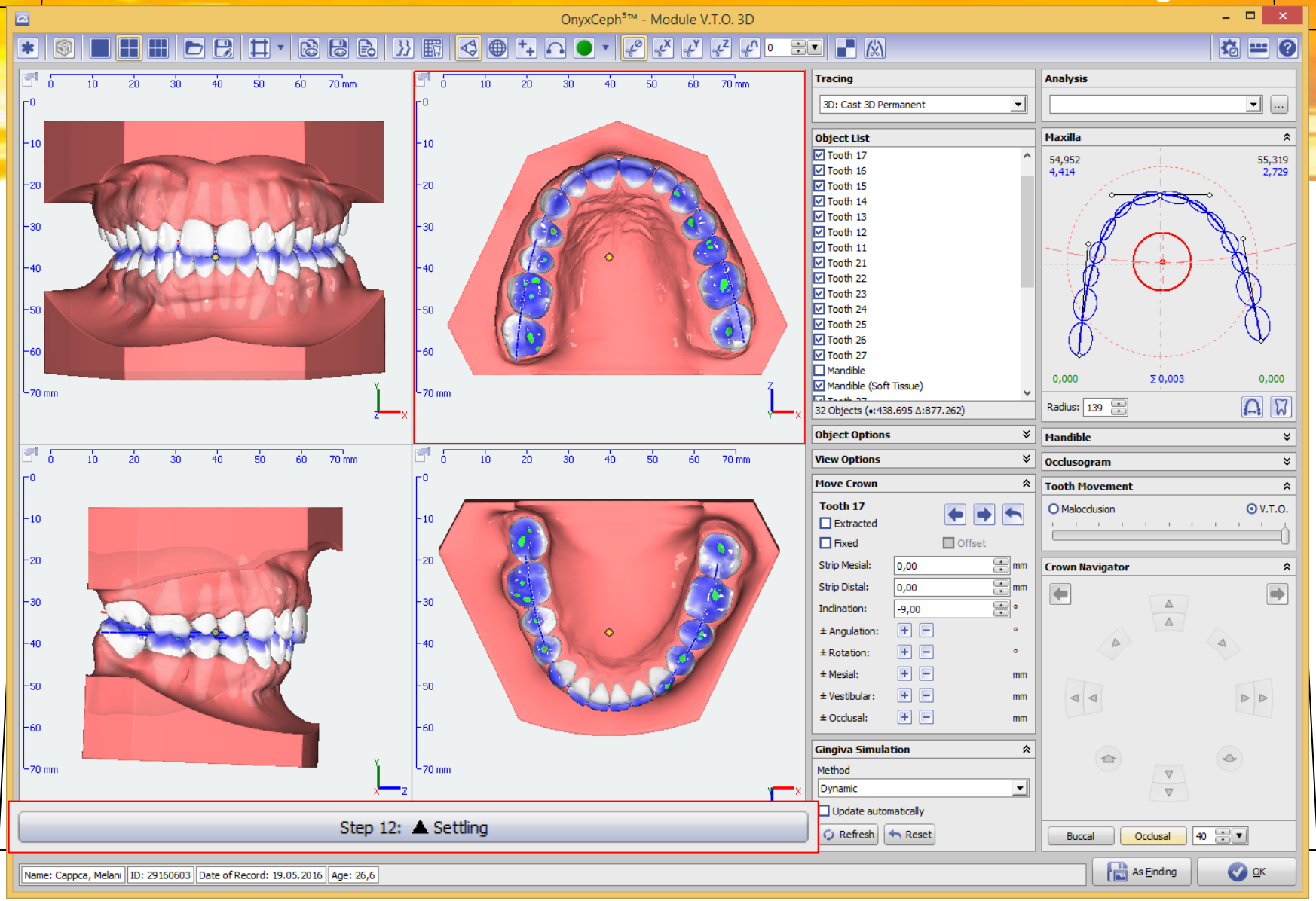
V.T.O.3D – Wizard: Step 11 : ▲ **Compensate Space Discrepancy + Manual Control**



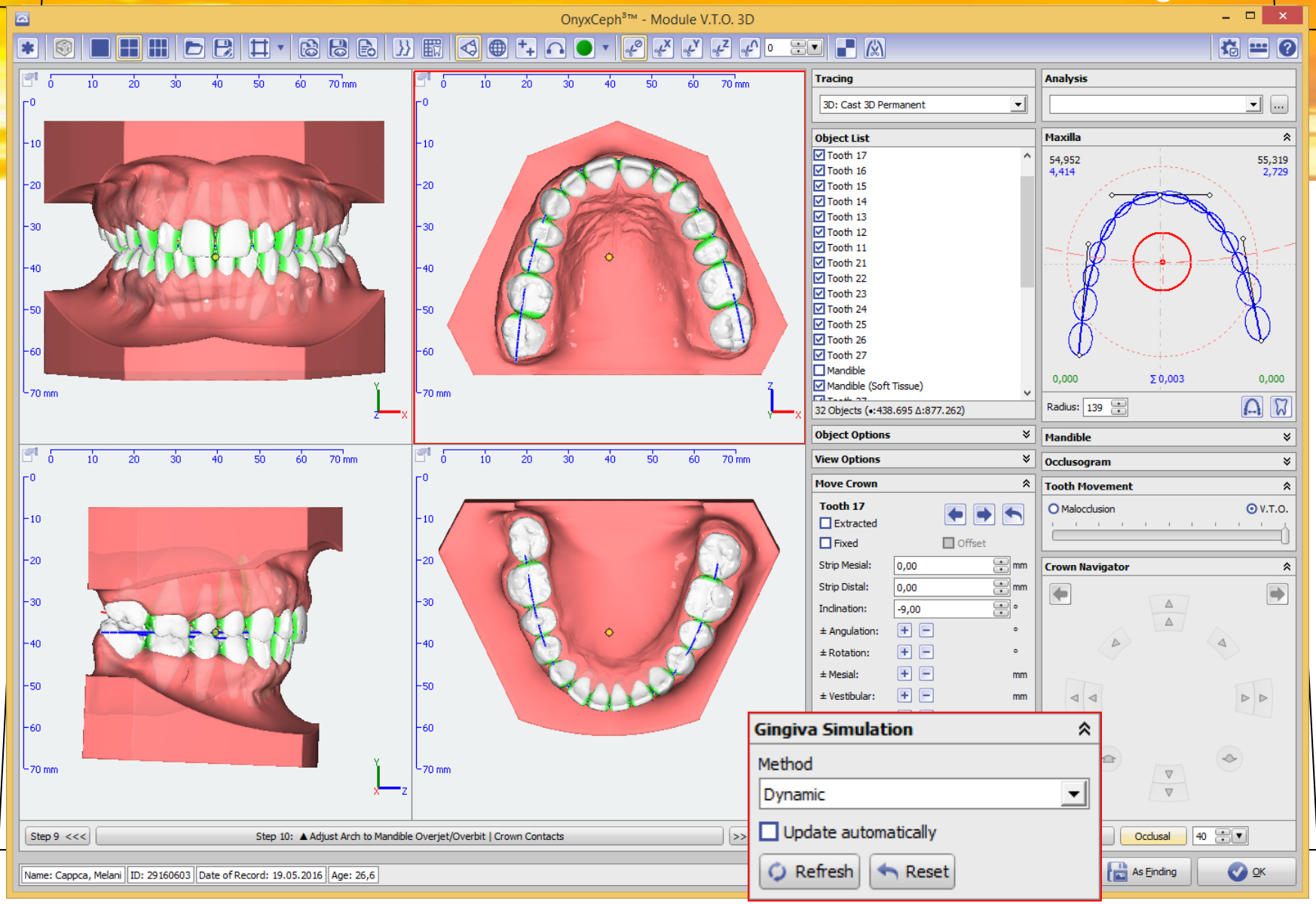
V.T.O.3D – Wizard: Step 11 : ▲ **Compensate Space Discrepancy + Manual Control**



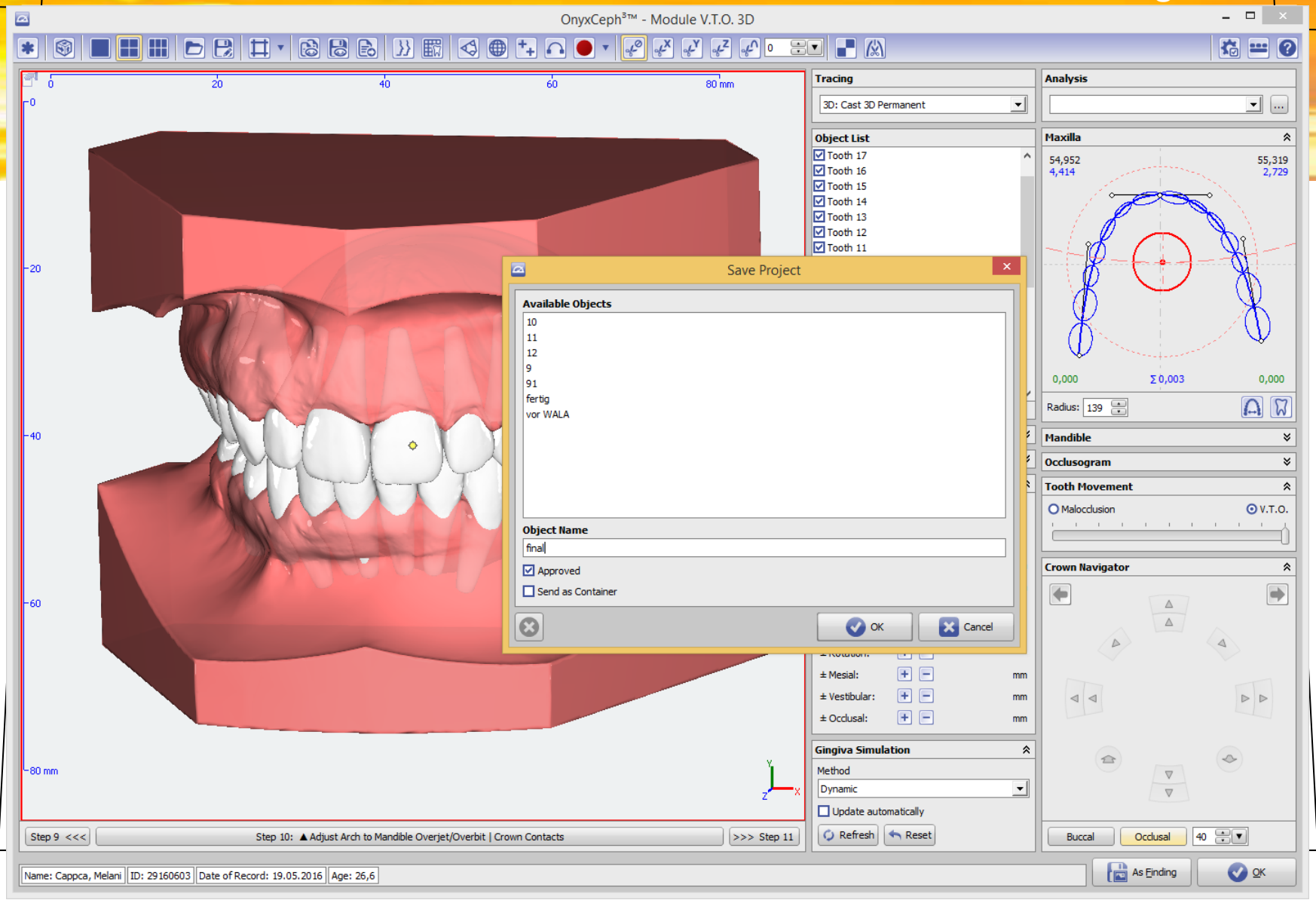
V.T.O.3D – Wizard: Step 12 : ▲ **Compensate Space Discrepancy + Manual Control**



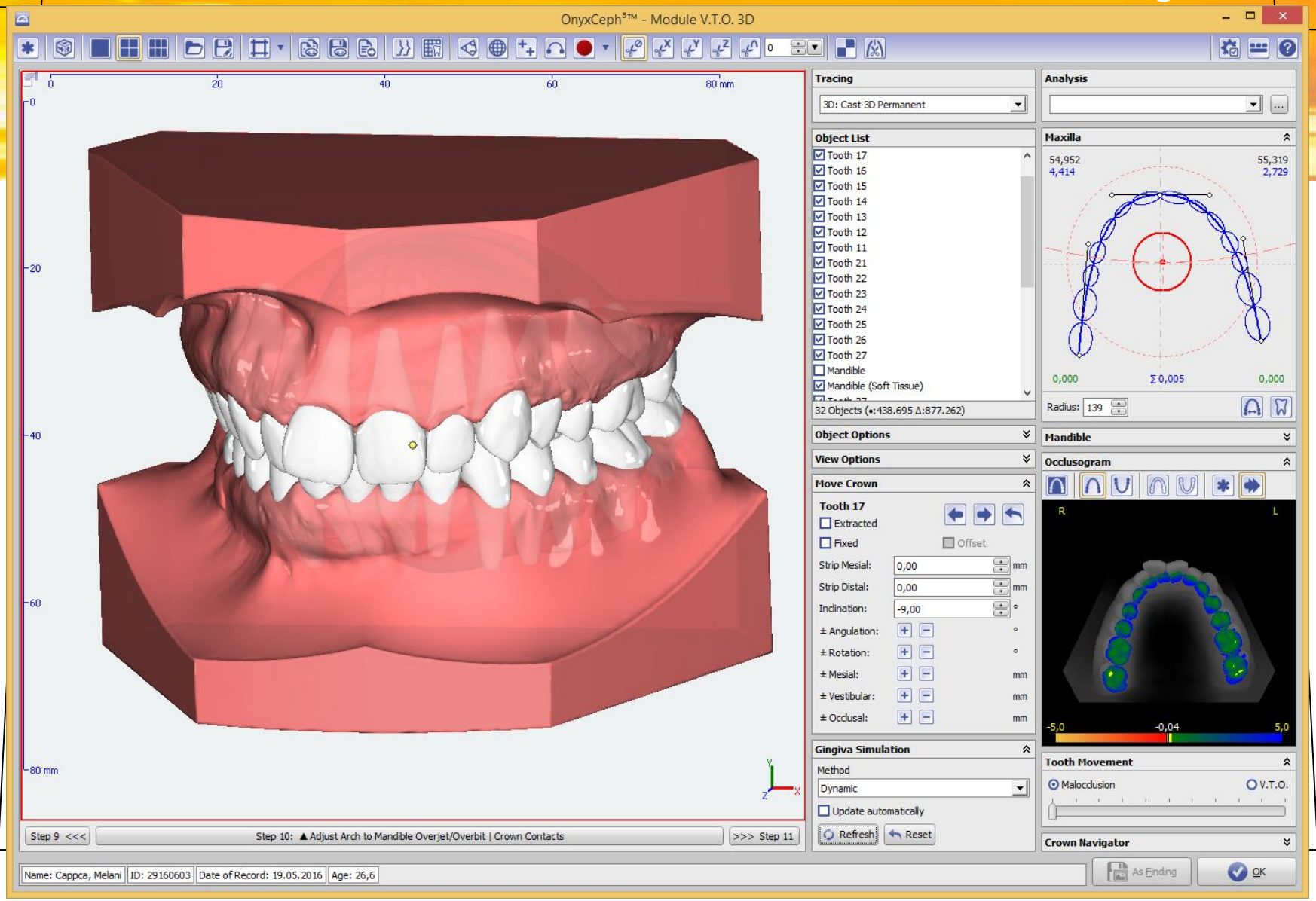
V.T.O.3D – Wizard: Step 12 : ▲ **Compensate Space Discrepancy + Manual Control**



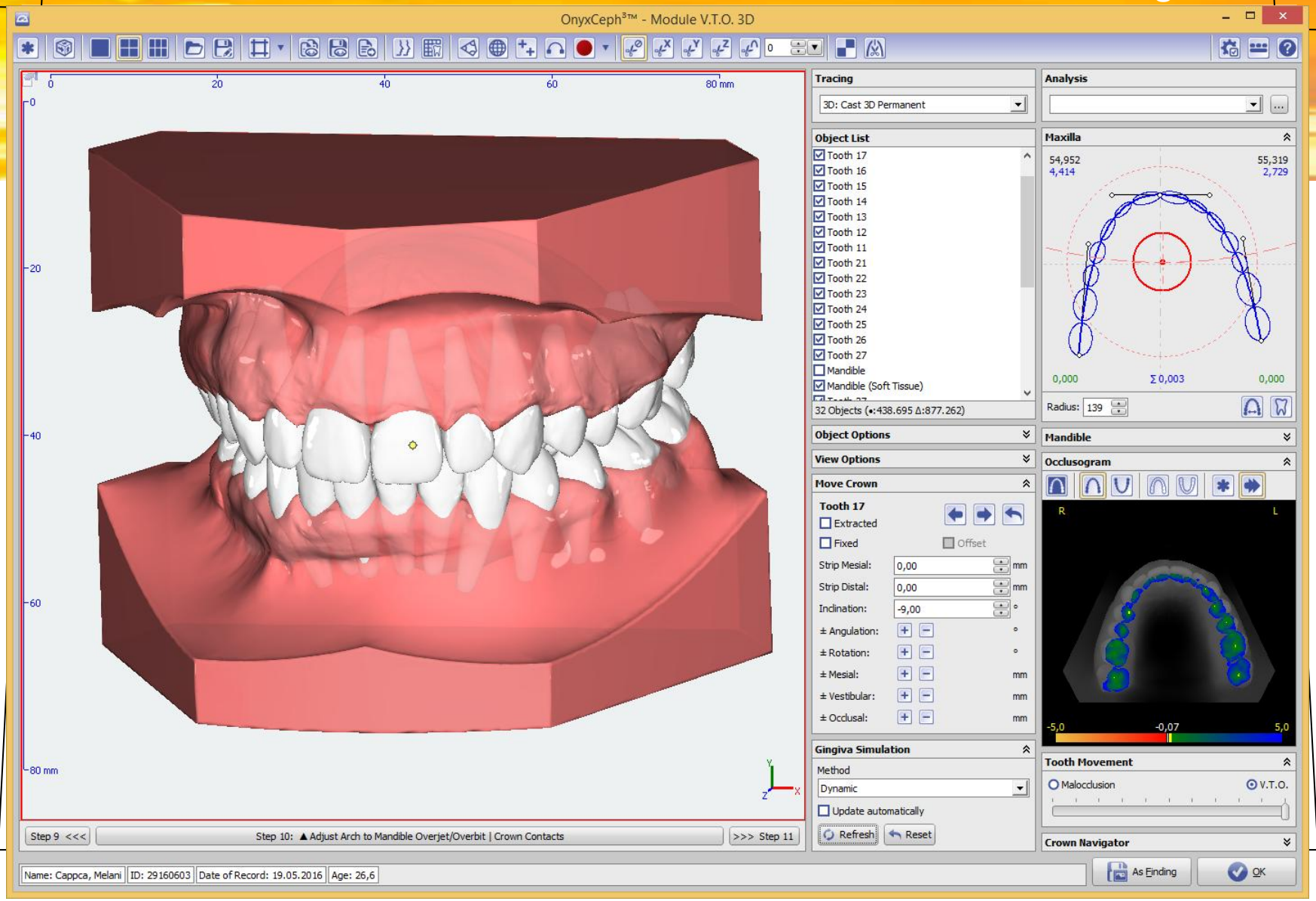
V.T.O.3D – Wizard: **Gingiva Simulation**



Saving V.T.O.3D – **Save Project**

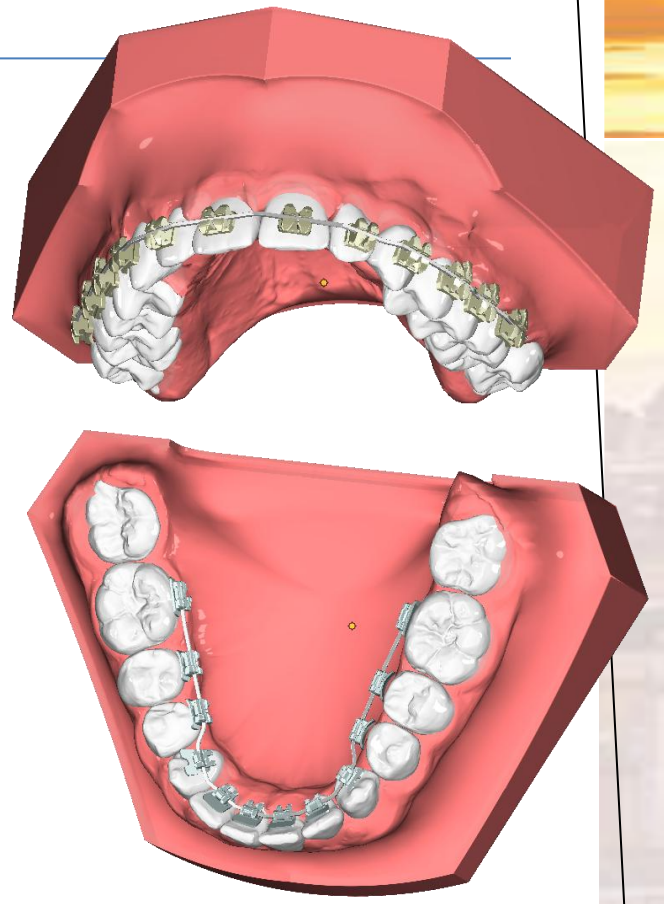


V.T.O.3D – **Start Situation**

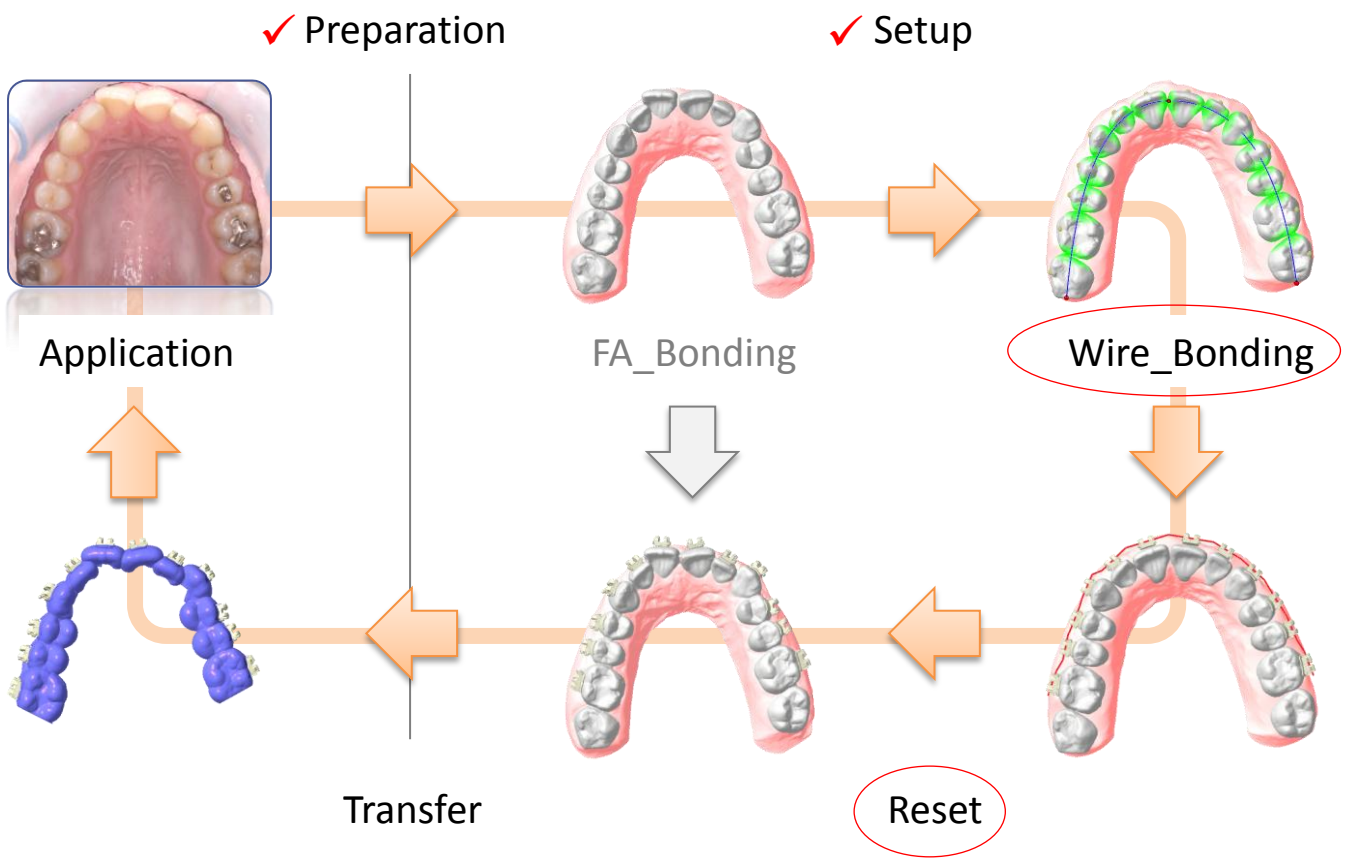


V.T.O.3D – **Visual Treatment Objective**

Digital i/d Bonding

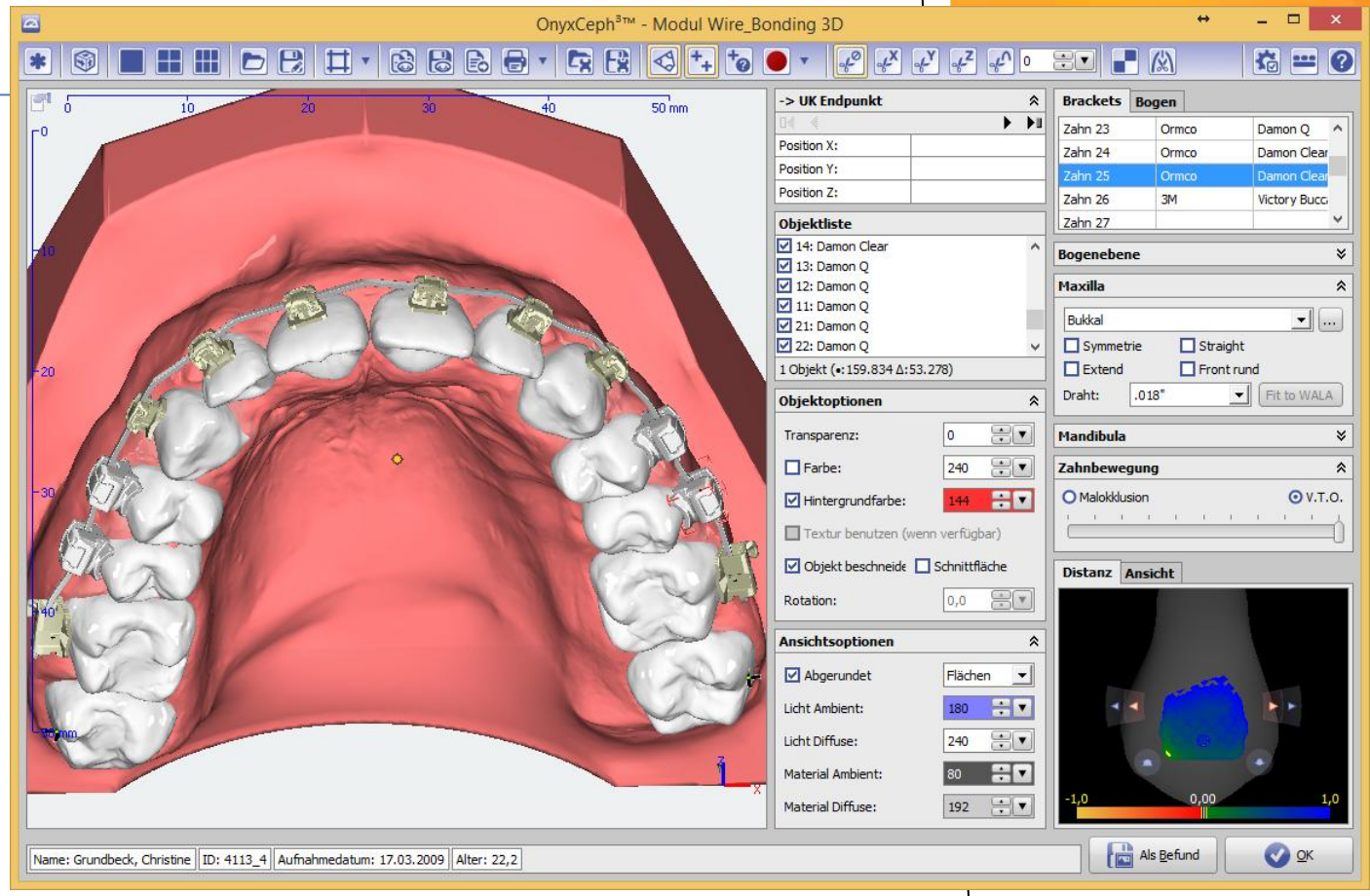


Wire_Bonding

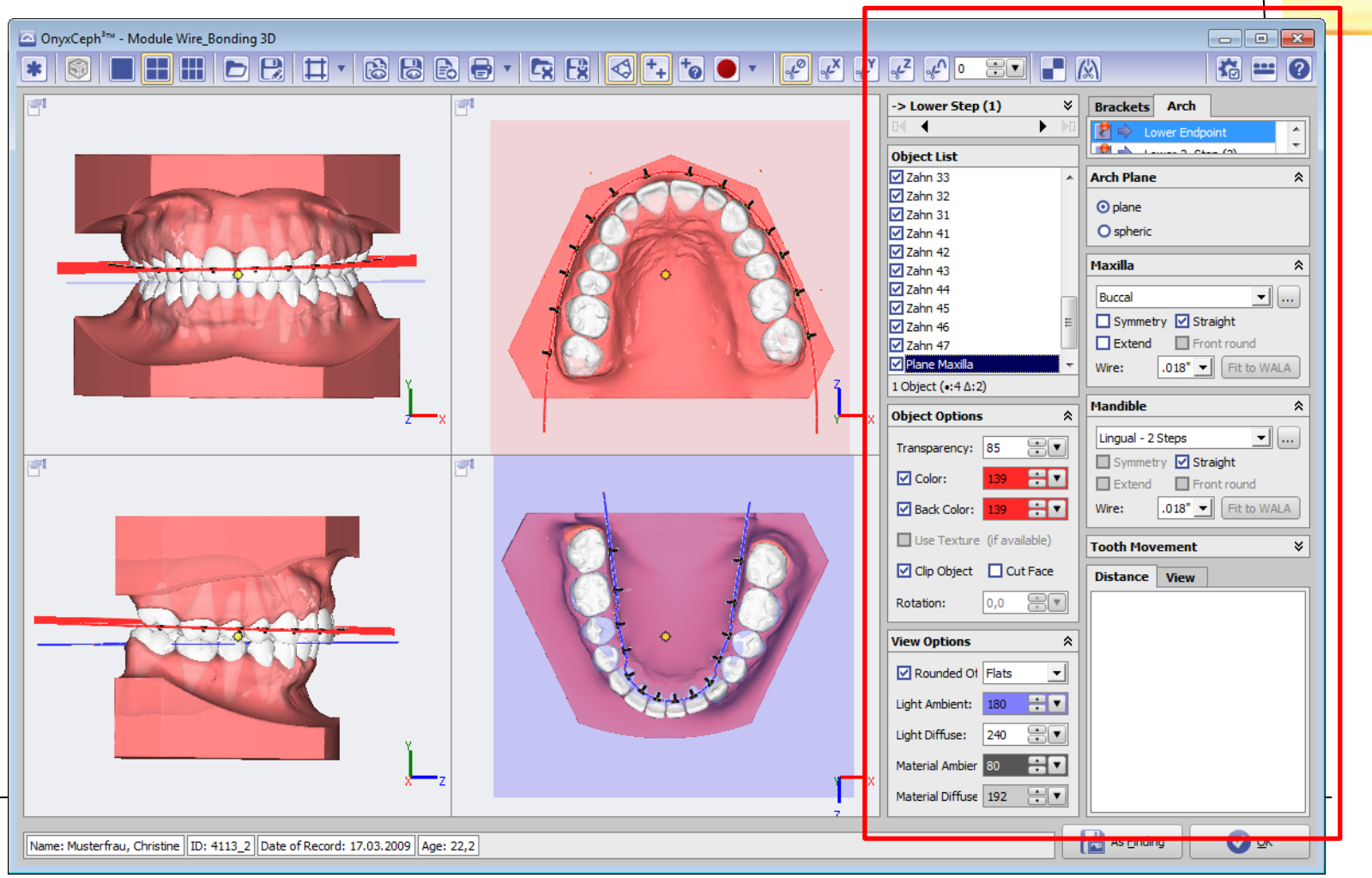


Wire_Bonding

- Add Image
- Adjust Image
- Digitize
- Combine
- Mirror
- Treatment Simulation 3D
- Image Comparison
- Cast Adjust
- Segmentation
- FA_Bonding
- V.T.O.3D
- **Wire Bonding**
- Kylix 3D
- Bonding Trays 3D
- Splint 3D
- Bracket Adapt
- Aligner 3D
- Retainer 3D
- Waefer Creation 3D

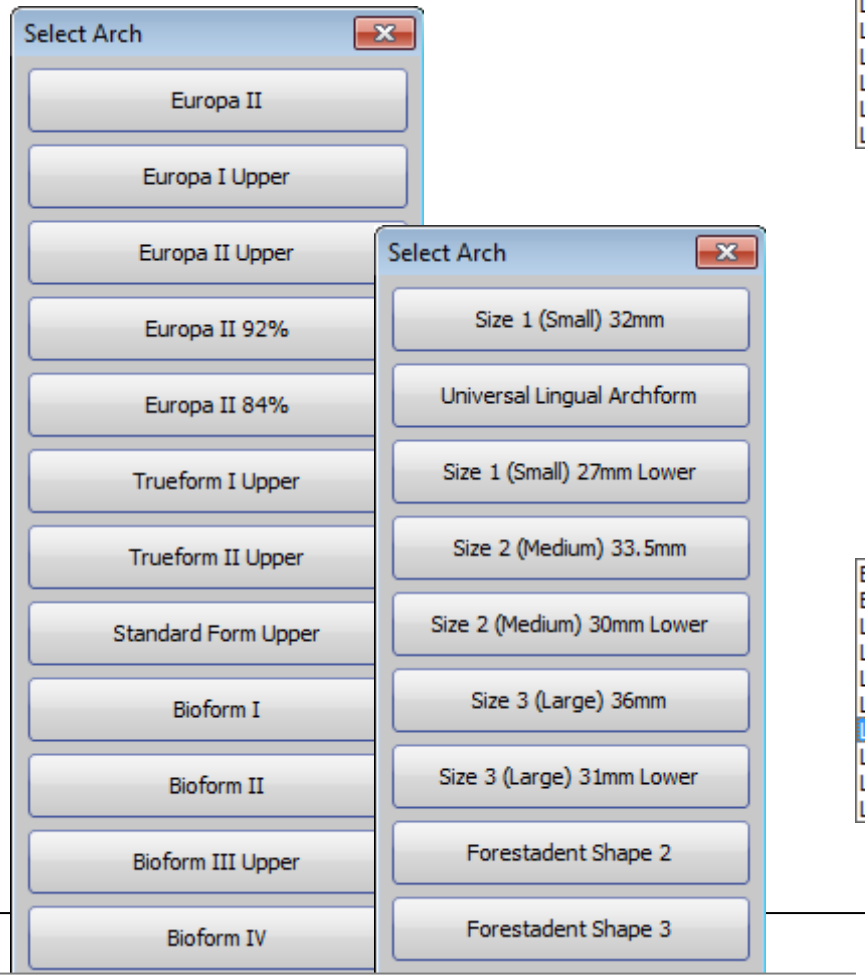


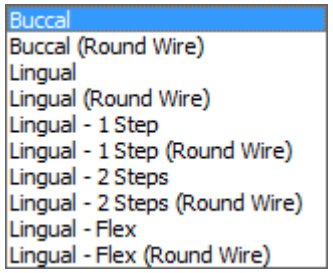
Wire_Bonding

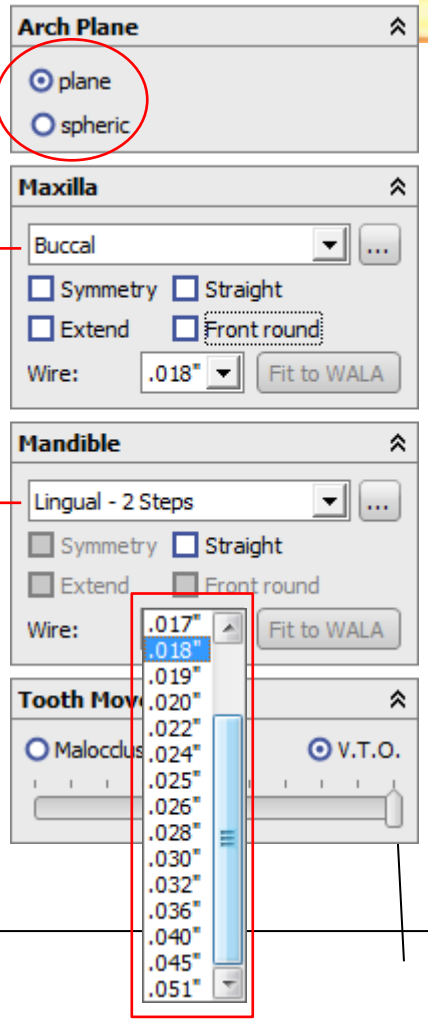


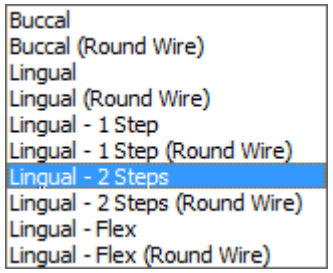
Wire_Bonding

Wire_Bonding

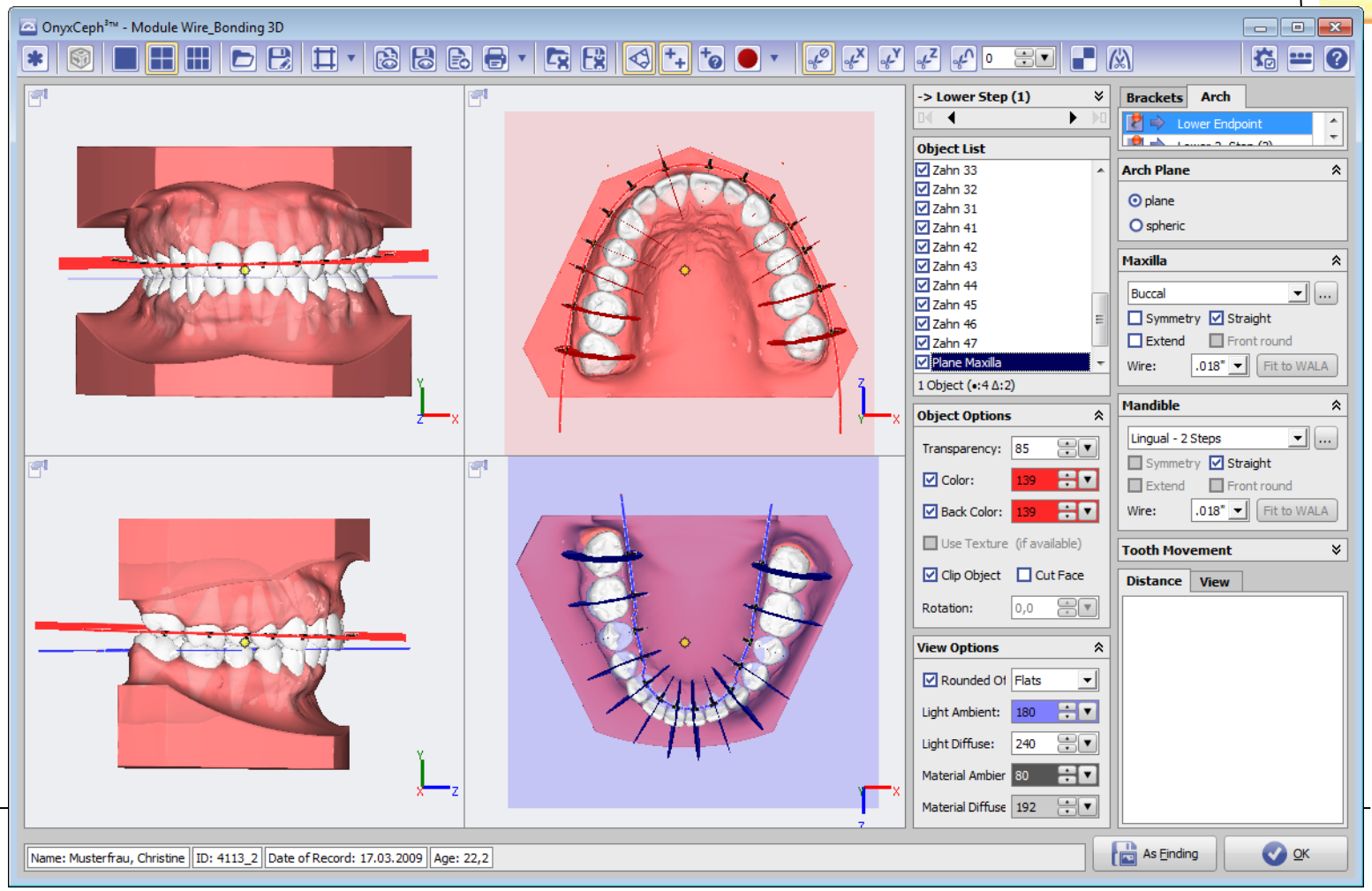








Wire_Bonding



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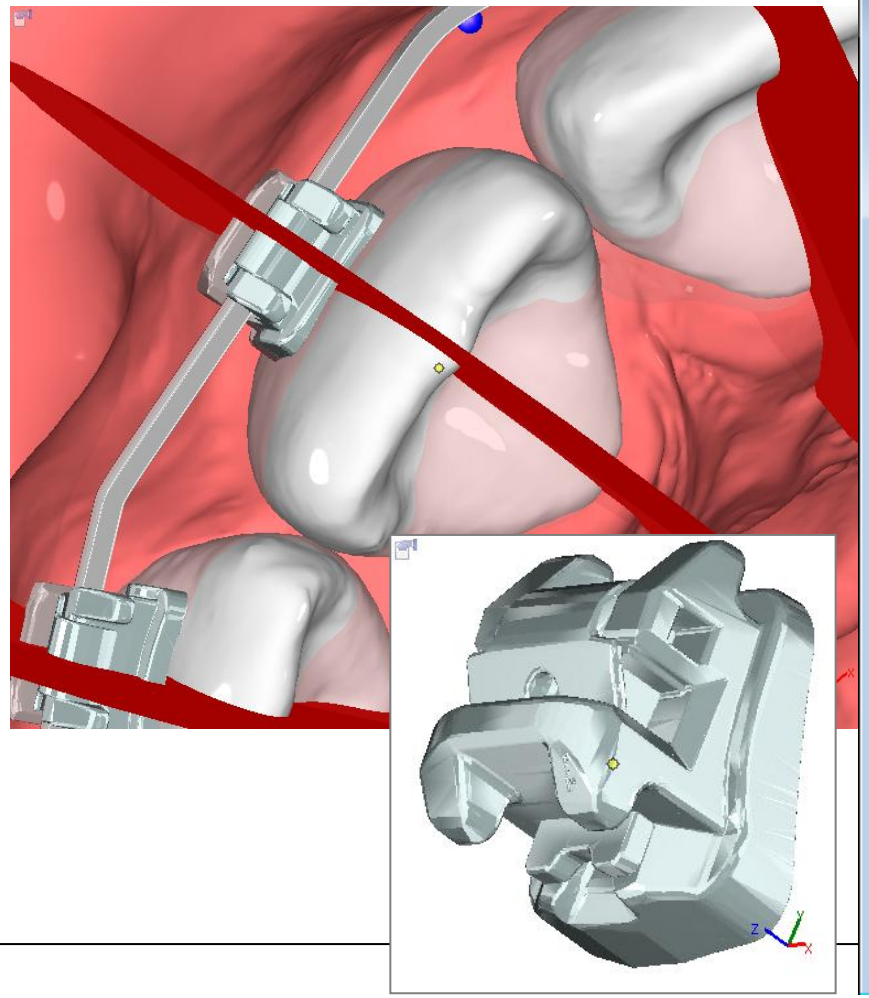
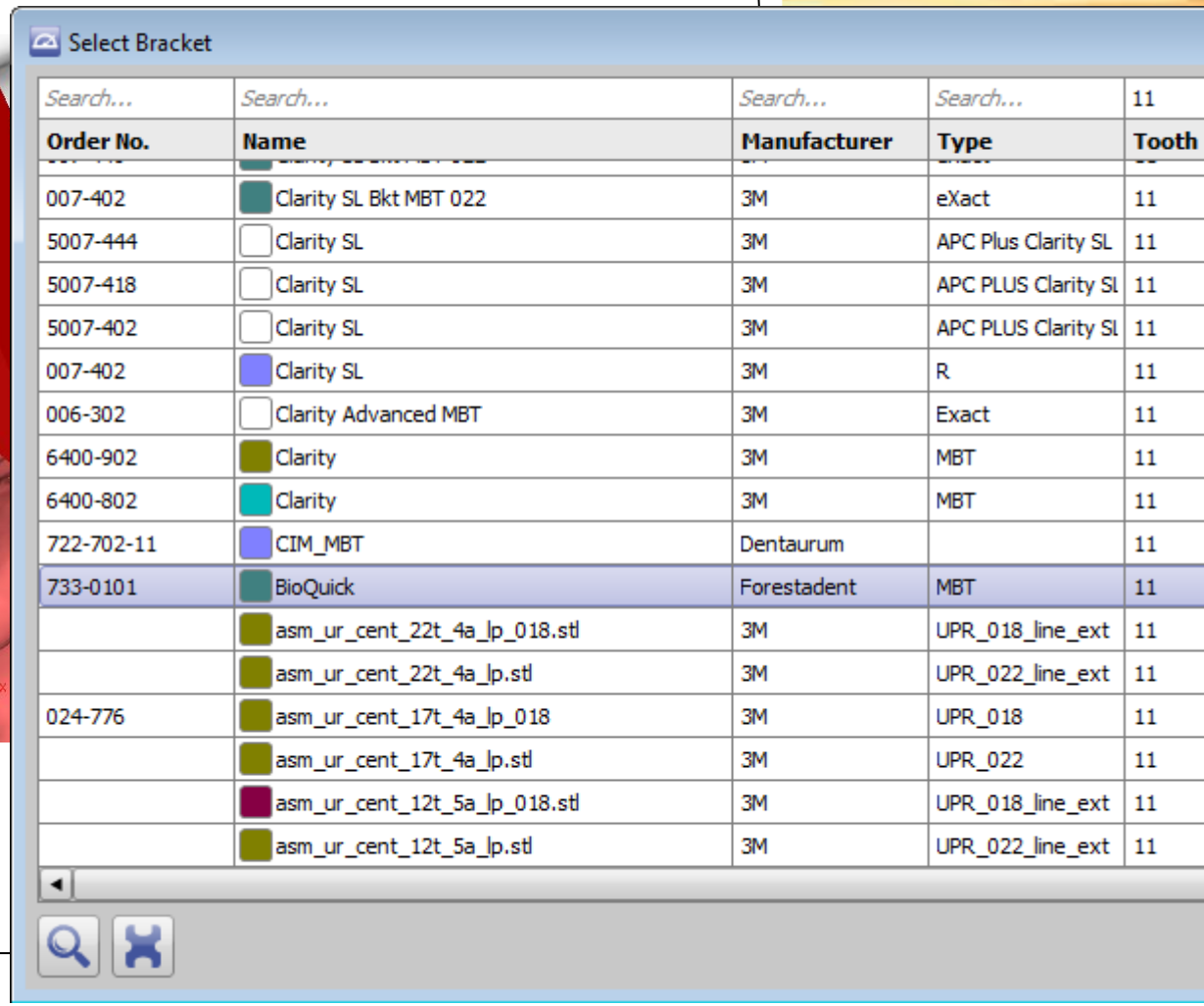


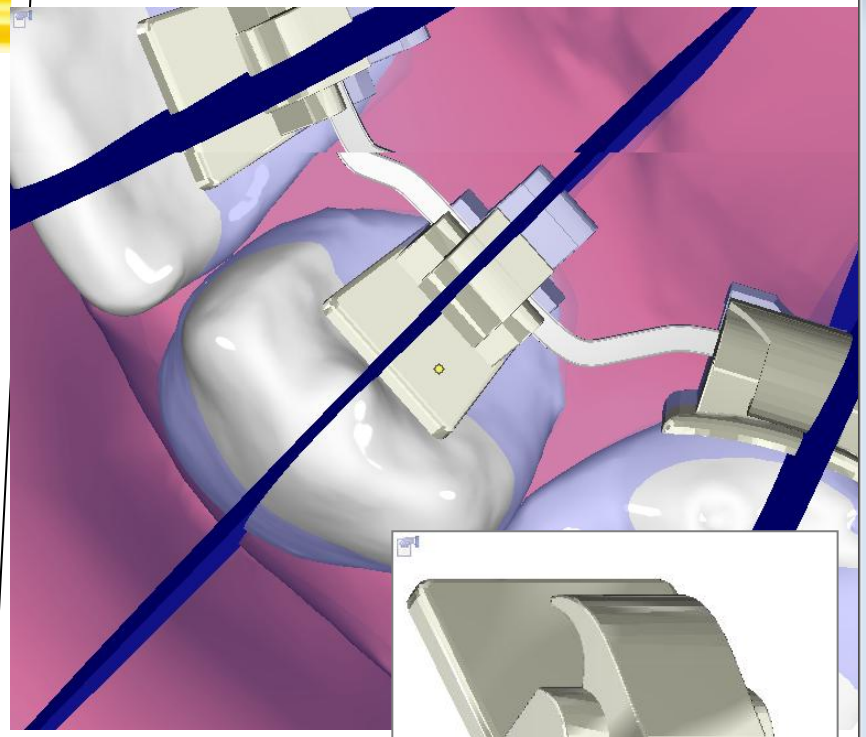


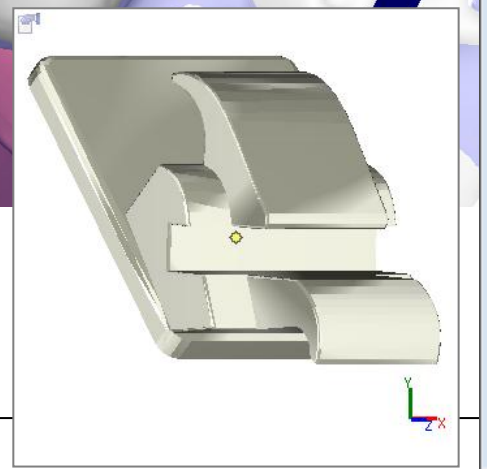
Select Bracket

Search...	Search...	Search...	Search...	11
Order No.	**Name**	**Manufacturer**	**Type**	**Tooth**
007-402	Clarity SL Bkt MBT 022	3M	eXact	11
5007-444	Clarity SL	3M	APC Plus Clarity SL	11
5007-418	Clarity SL	3M	APC PLUS Clarity Sl	11
5007-402	Clarity SL	3M	APC PLUS Clarity Sl	11
007-402	Clarity SL	3M	R	11
006-302	Clarity Advanced MBT	3M	Exact	11
6400-902	Clarity	3M	MBT	11
6400-802	Clarity	3M	MBT	11
722-702-11	CIM_MBT	Dentaurum		11
733-0101	BioQuick	Forestadent	MBT	11
	asm_ur_cent_22t_4a_lp_018.stl	3M	UPR_018_line_ext	11
	asm_ur_cent_22t_4a_lp.stl	3M	UPR_022_line_ext	11
024-776	asm_ur_cent_17t_4a_lp_018	3M	UPR_018	11
	asm_ur_cent_17t_4a_lp.stl	3M	UPR_022	11
	asm_ur_cent_12t_5a_lp_018.stl	3M	UPR_018_line_ext	11
	asm_ur_cent_12t_5a_lp.stl	3M	UPR_022_line_ext	11

Wire_Bonding: Buccal Brackets

Wire_Bonding



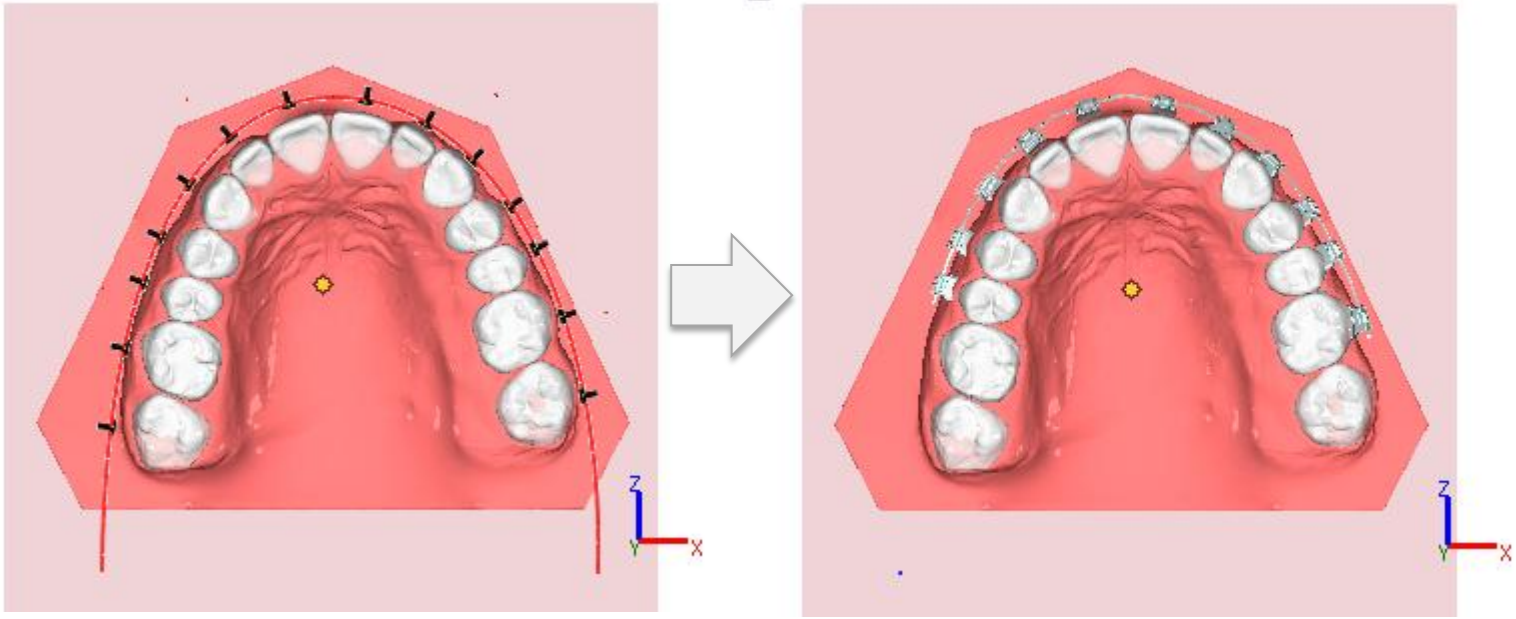


Select Bracket

Search...	Search...	Search...	Search...	33
Order No.	**Name**	**Manufacturer**	**Type**	**Tooth**
017-681	Victory Twin	3M		33
	STB Lower Front	LLS Fillion		31;32;3
369-2110	STb	Ormco	eXact	31;32;3
369-3110	STb	Ormco	eXact	31;32;3
PH-10-46	Phantom 2.0	Gestenco		11;12;1
	Onyx System Lingual	Orthorobot	Dummy	33;43
none	LLS front lower	LLS Fillion		31;32;3
	Lingual_Front	Dentaurum		11;12;1
90-611-90	In-Ovation L mtm	DENTSPLY GAC		31;32;3
17-163U-0010	Experience LSB C	Tomy	SLB	33;43
17-1610-0010	Experience LSB C	Tomy	SLB	31;32;3
17-1610-0050	Experience LSB C	Tomy	SLB Narrow Base	31;32;3
17-1610-0050	Experience LSB	Tomy	SLB Narrow Base	31;32;3
17-163U-0010	Experience LSB	Tomy	SLB	33;43
17-1610-0010	Experience LSB	Tomy	SLB	31;32;3
16-1630-0010	Experience L C	Tomy	SLB	33;43

Wire_Bonding: Lingual Brackets

Wire_Bonding



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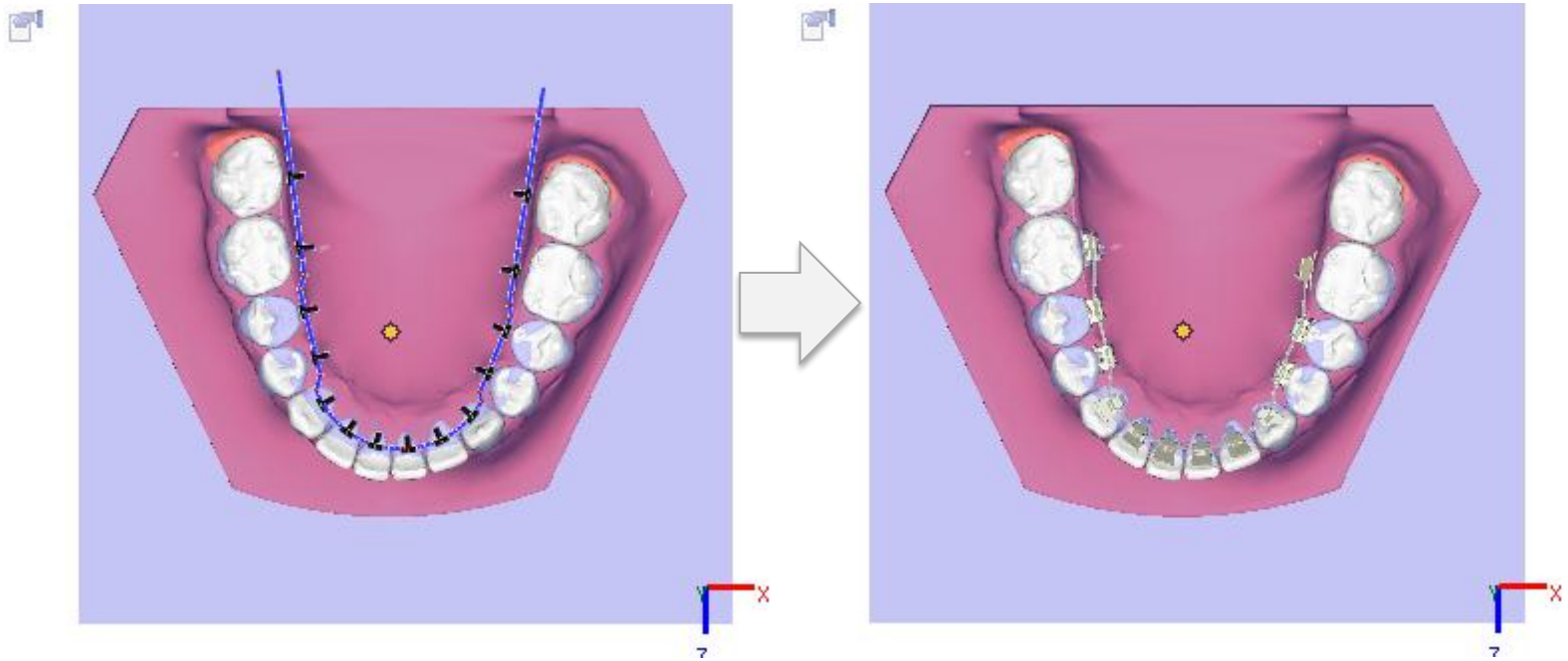
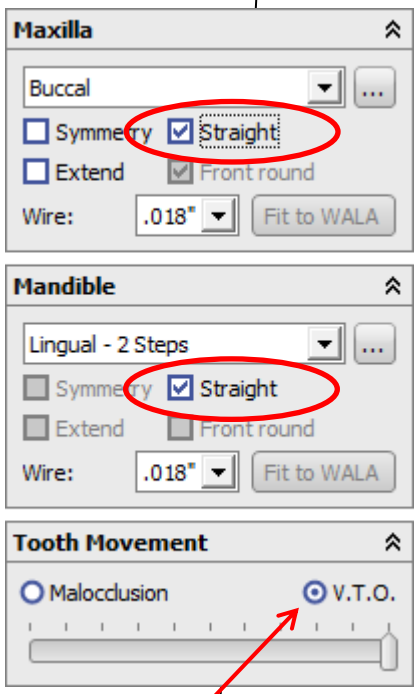
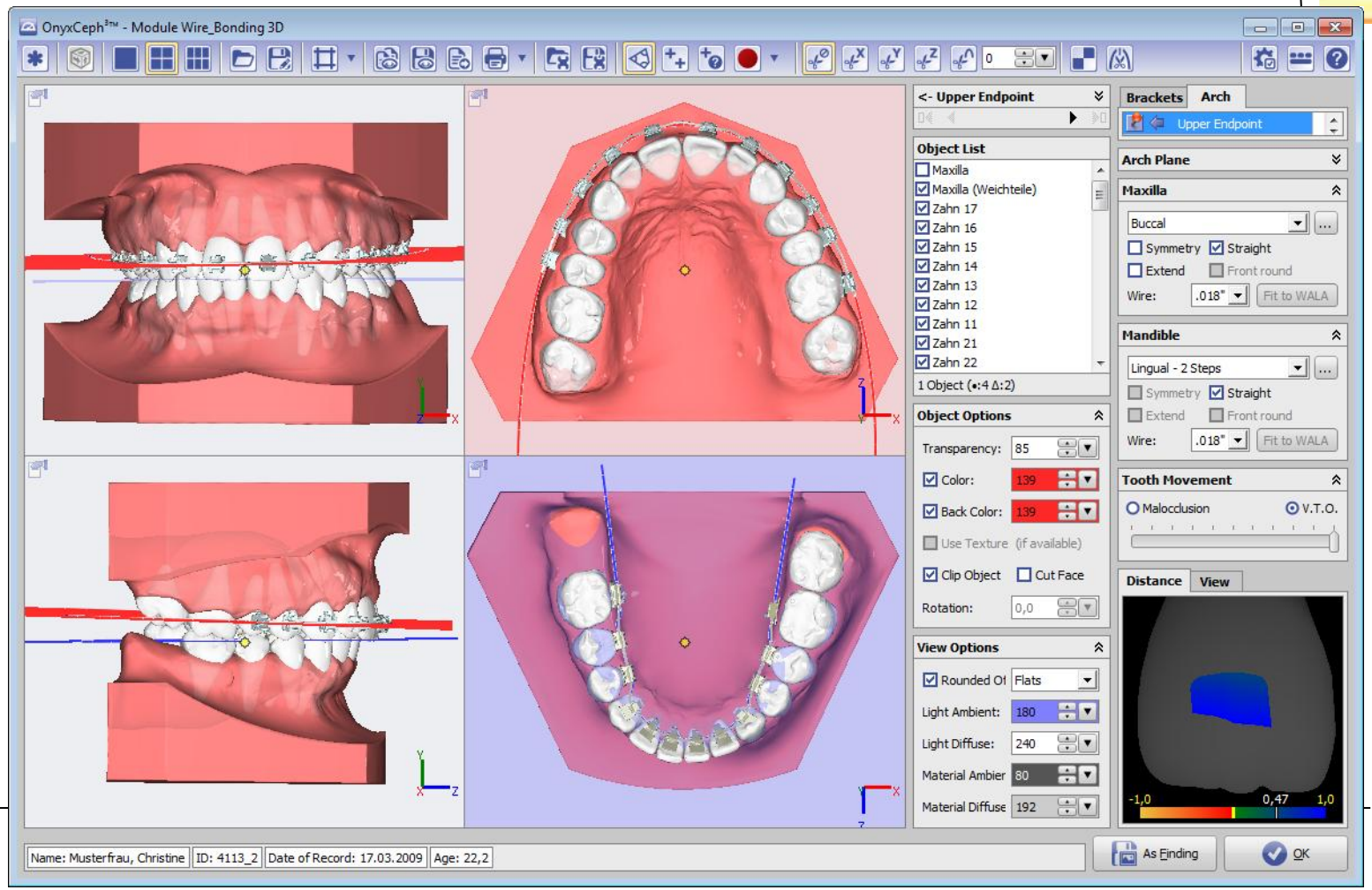


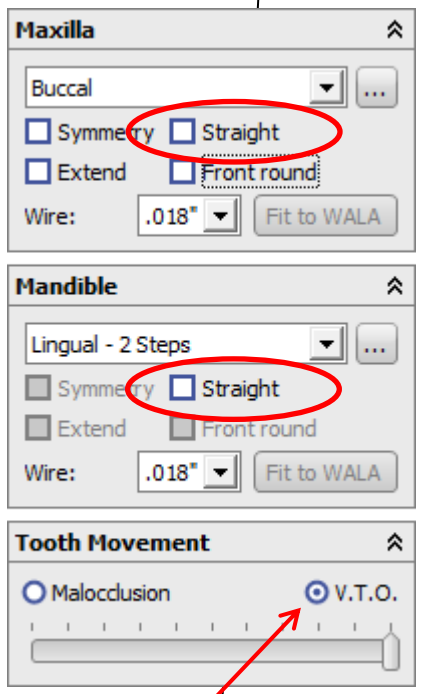
Wire_Bonding

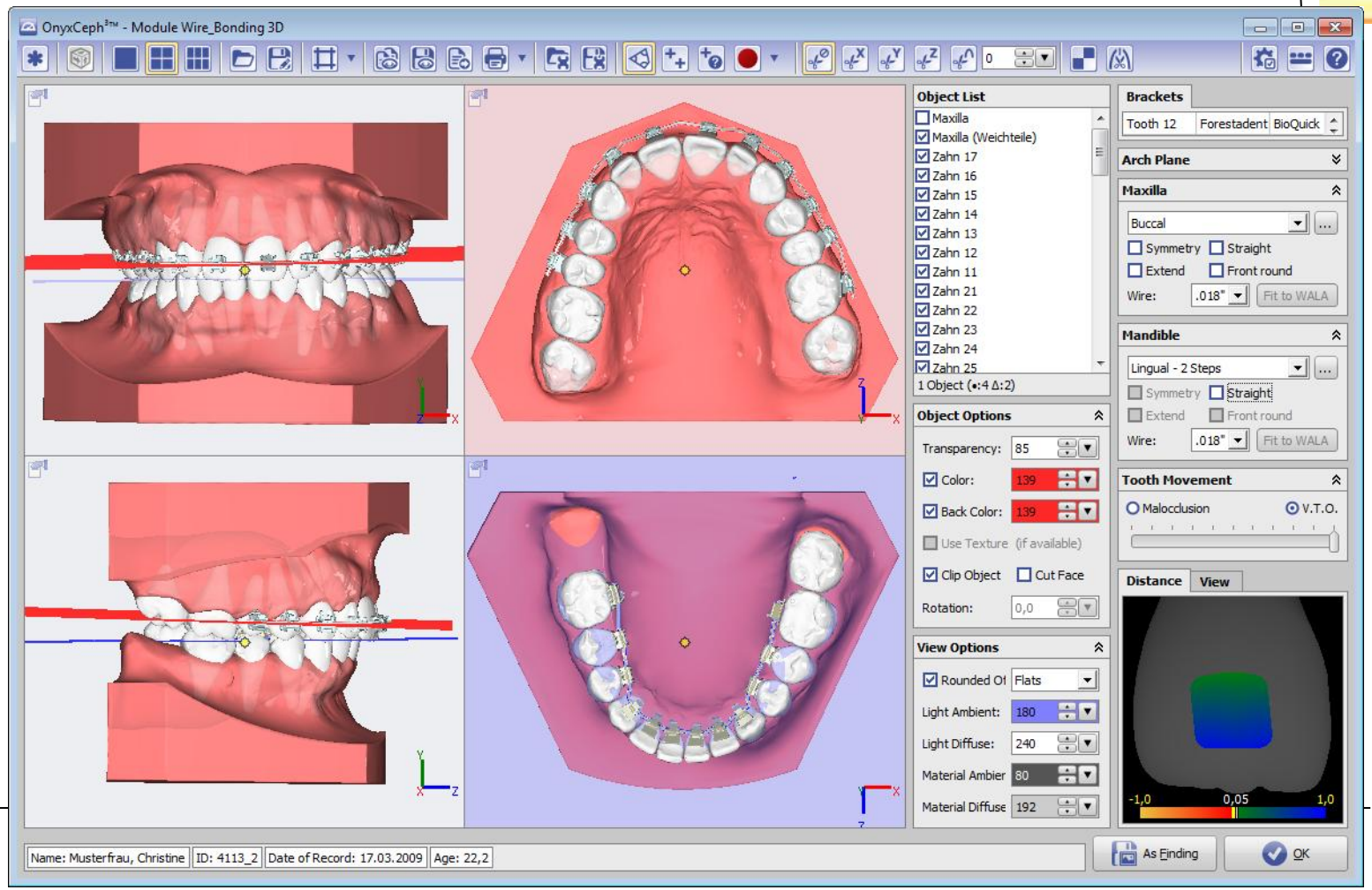




Wire_Bonding: Plain Straight Wire

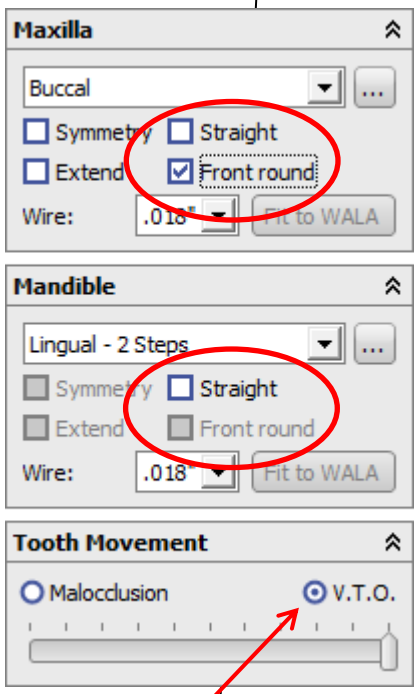
Wire_Bonding

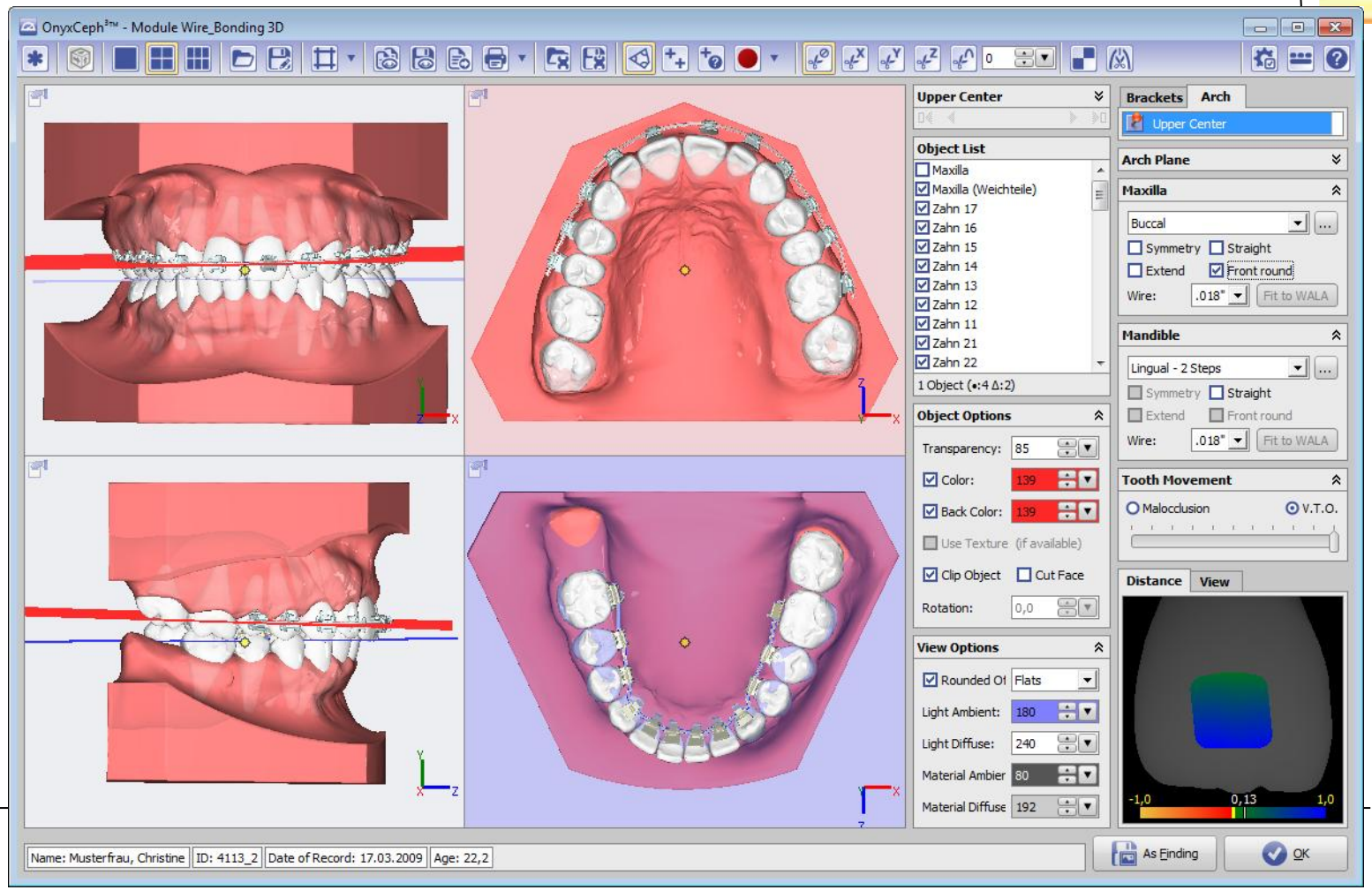




Wire_Bonding: Plain Non-Straight Wire

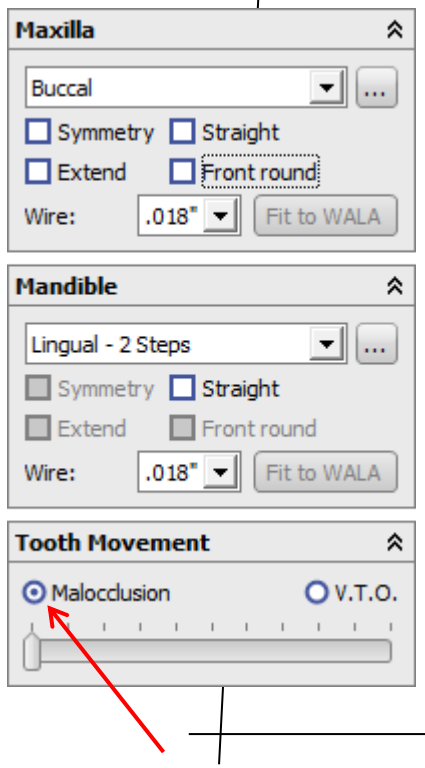
Wire_Bonding

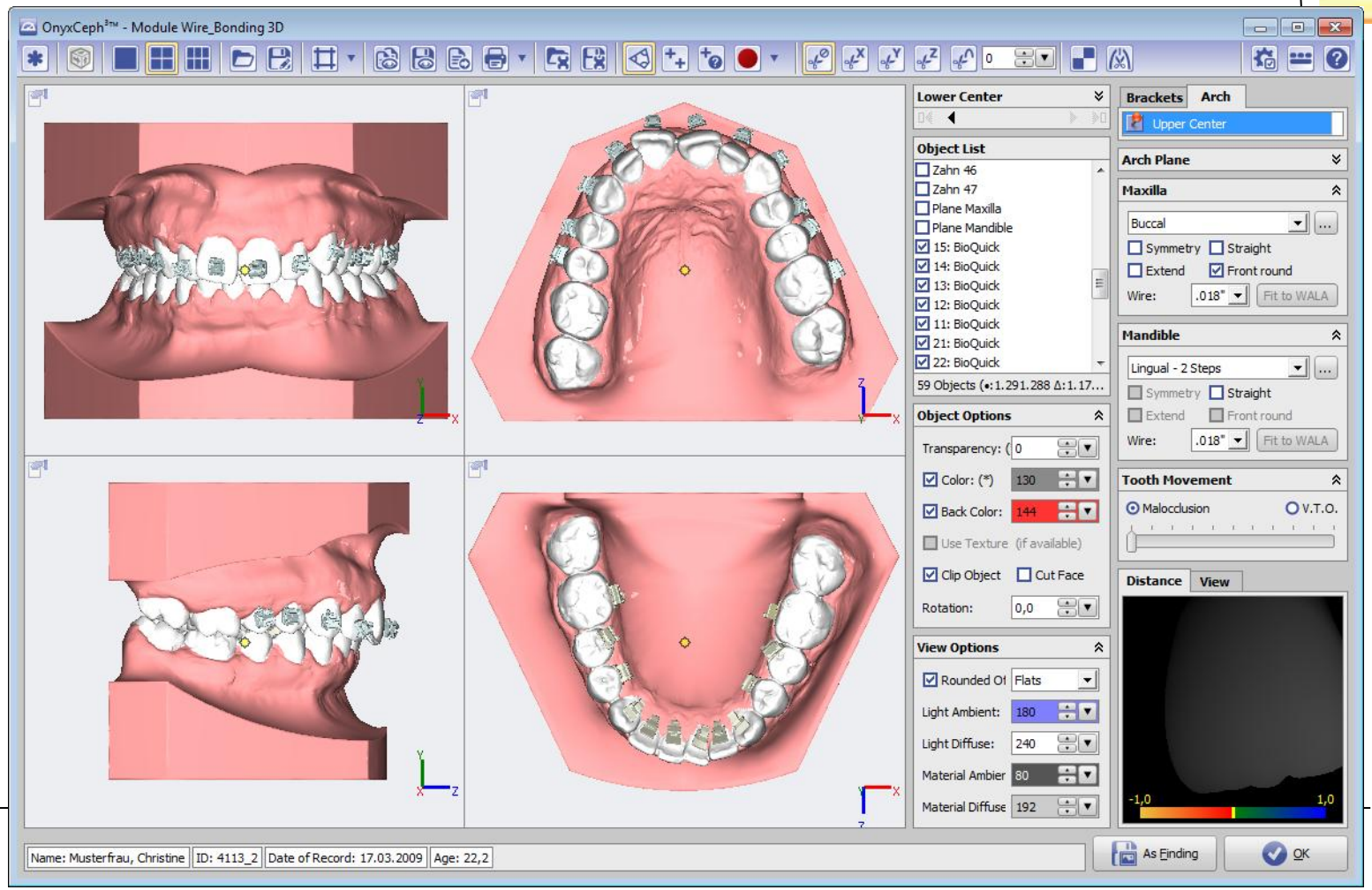




Wire_Bonding: Plain Non-Straight Wire With Straight Front 3-3

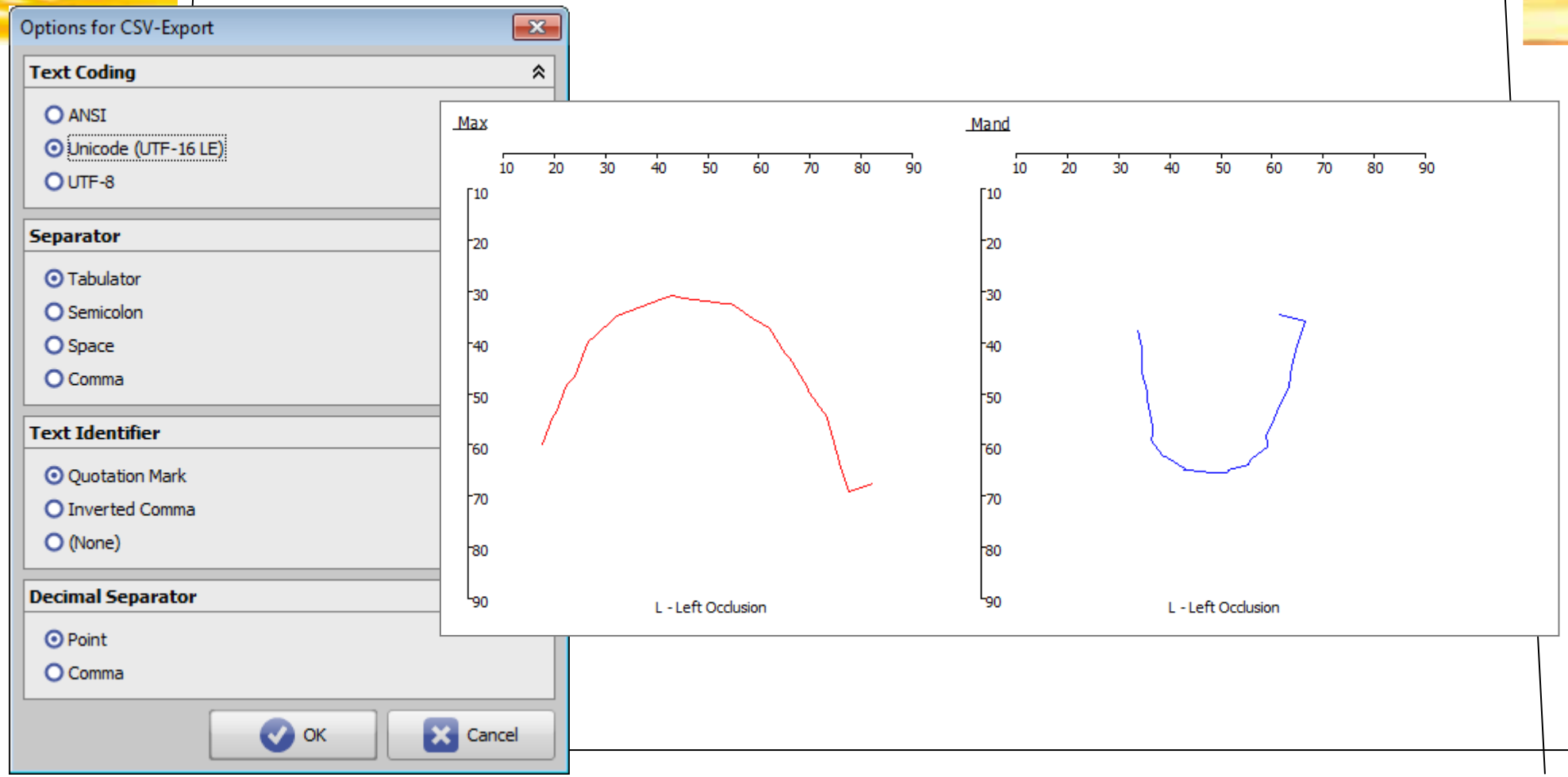
Wire_Bonding



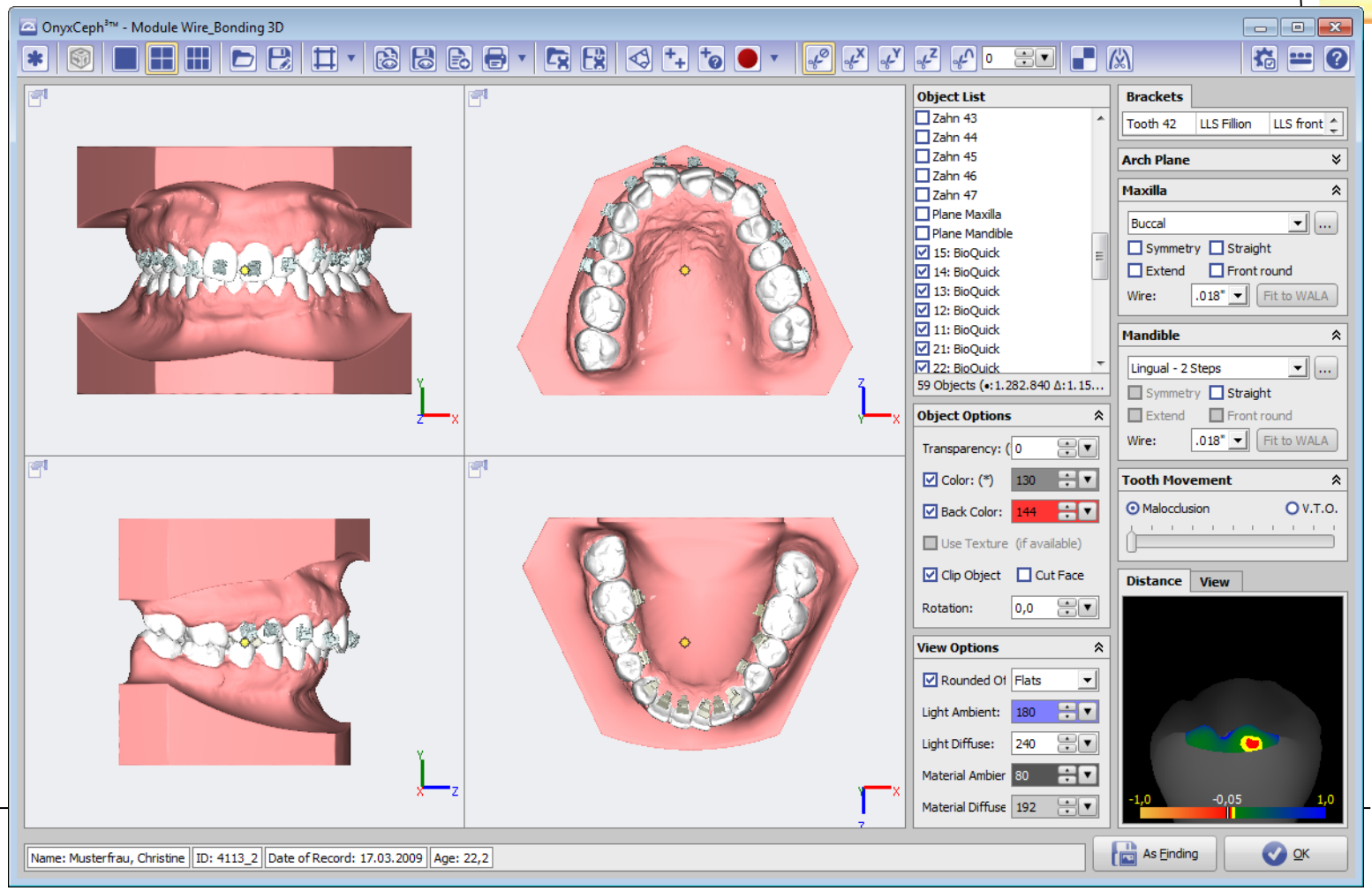


Wire_Bonding: Reset To Malocclusion

Wire_Bonding

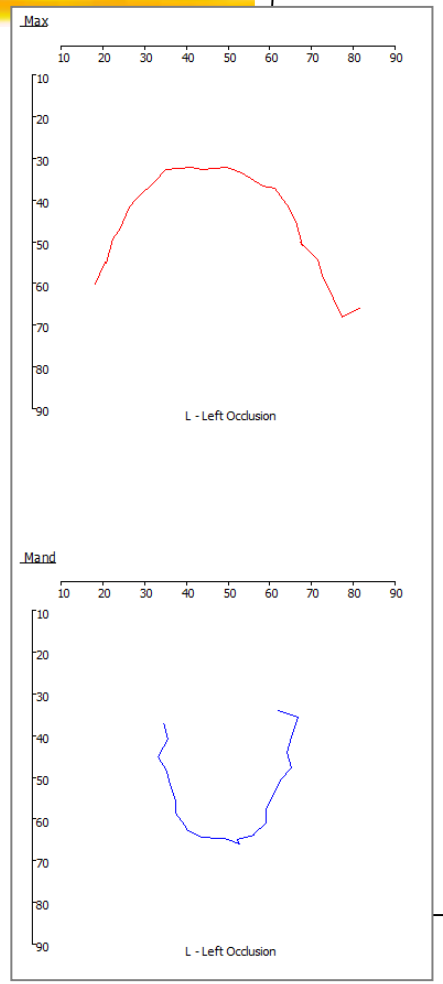


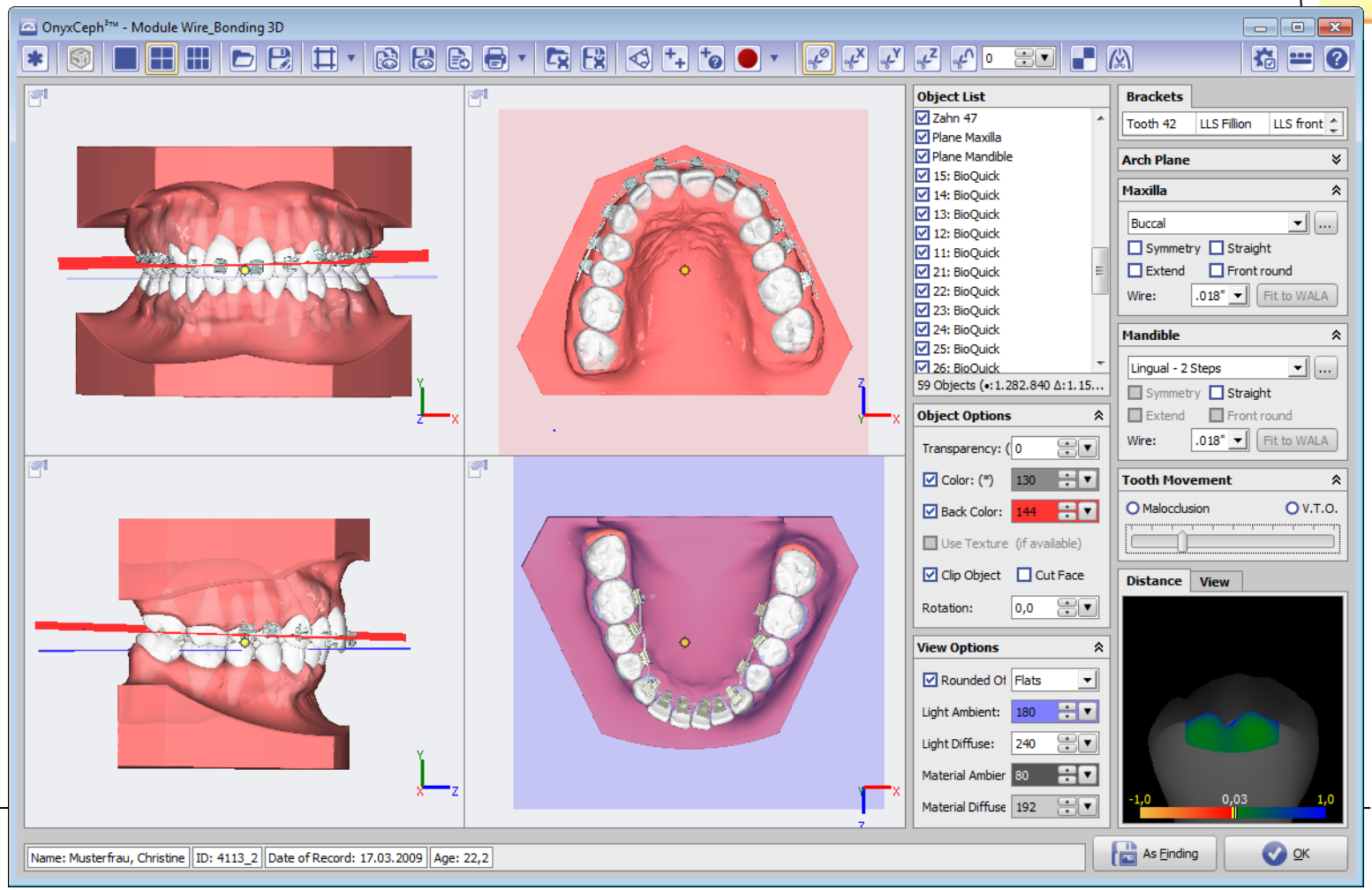
Wire_Bonding



Wire_Bonding: Wire Steps - Malocclusion

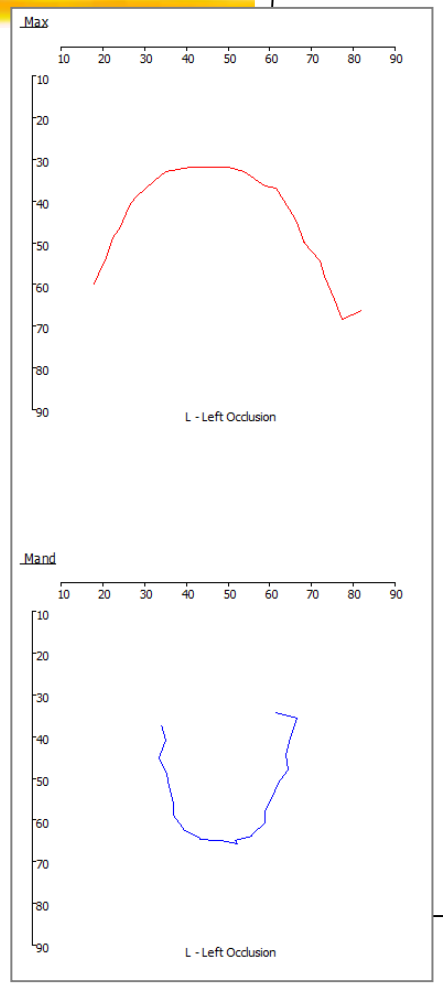
Wire_Bonding

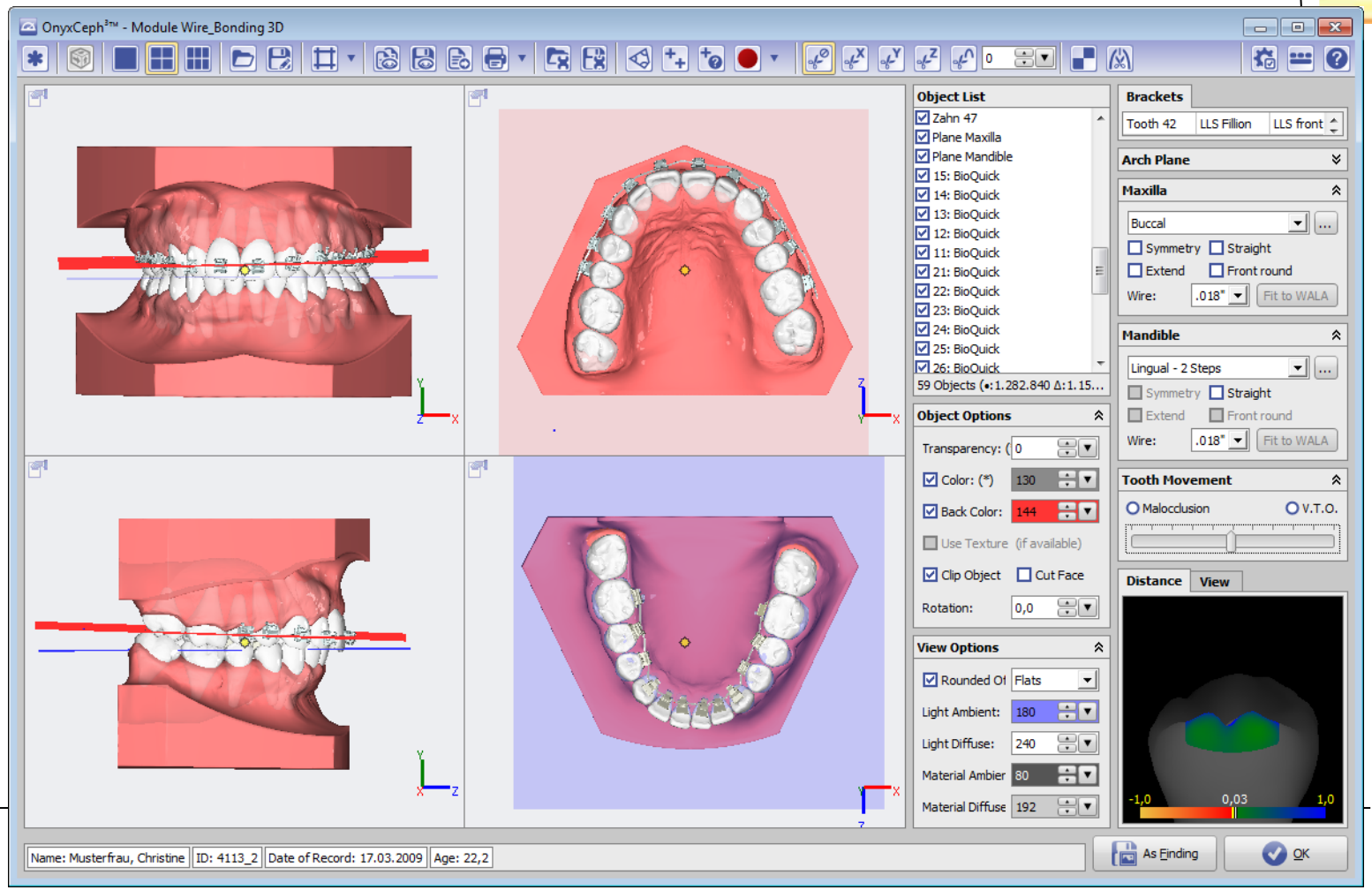




Wire_Bonding: Wire Steps – Step 1

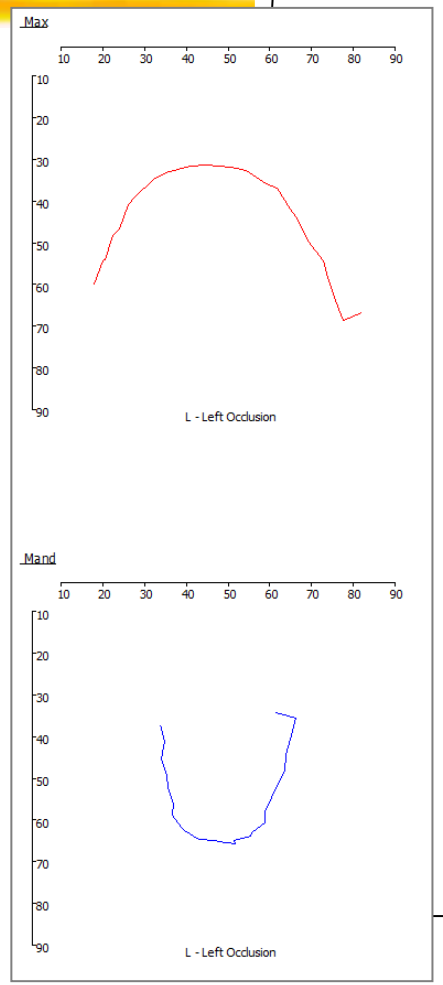
Wire_Bonding

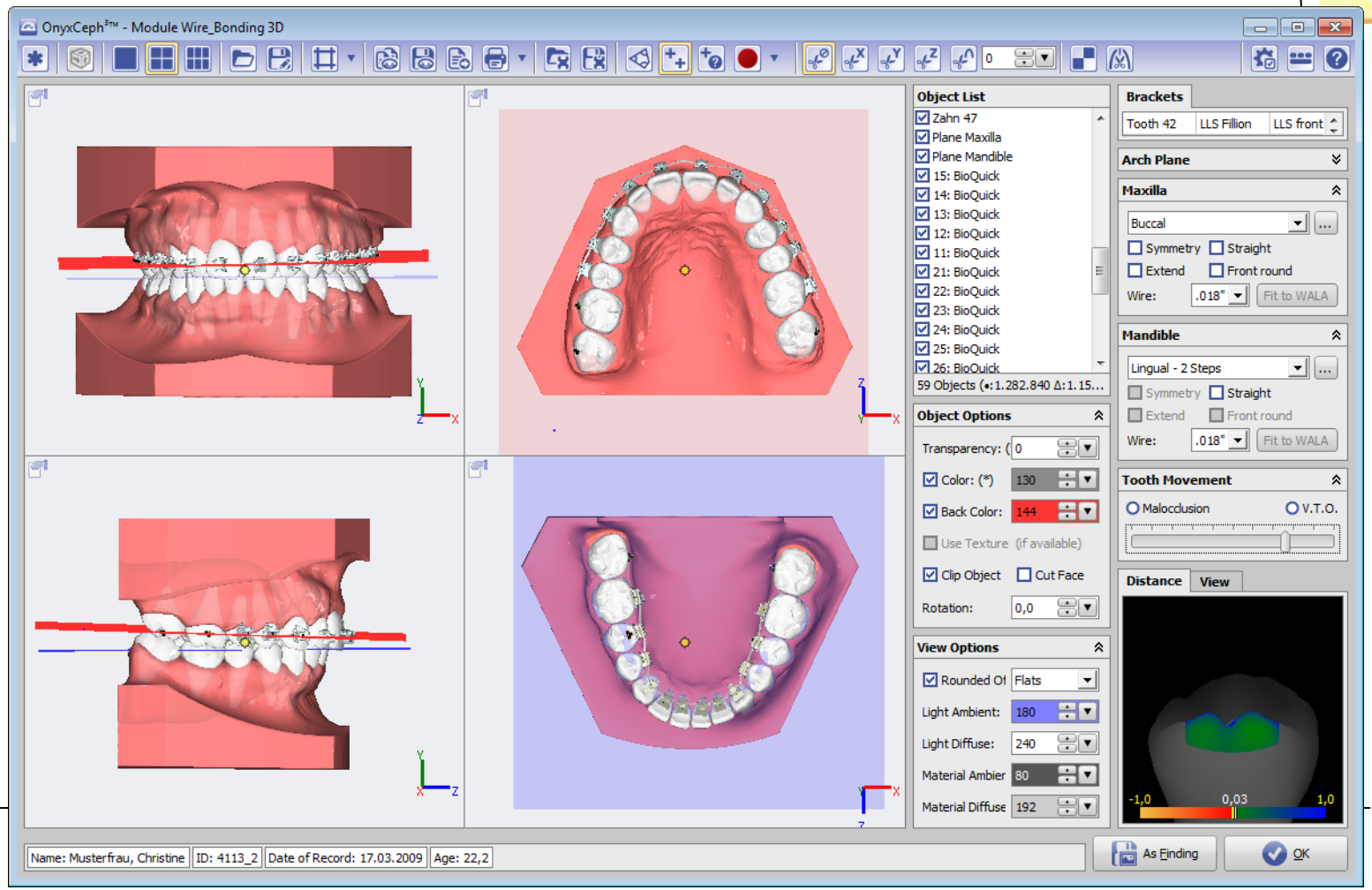




Wire_Bonding: Wire Steps – Step 2

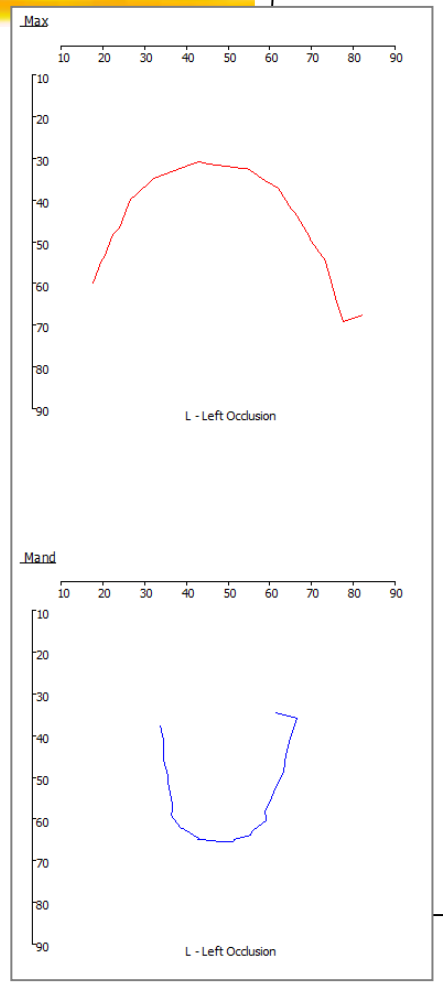
Wire_Bonding

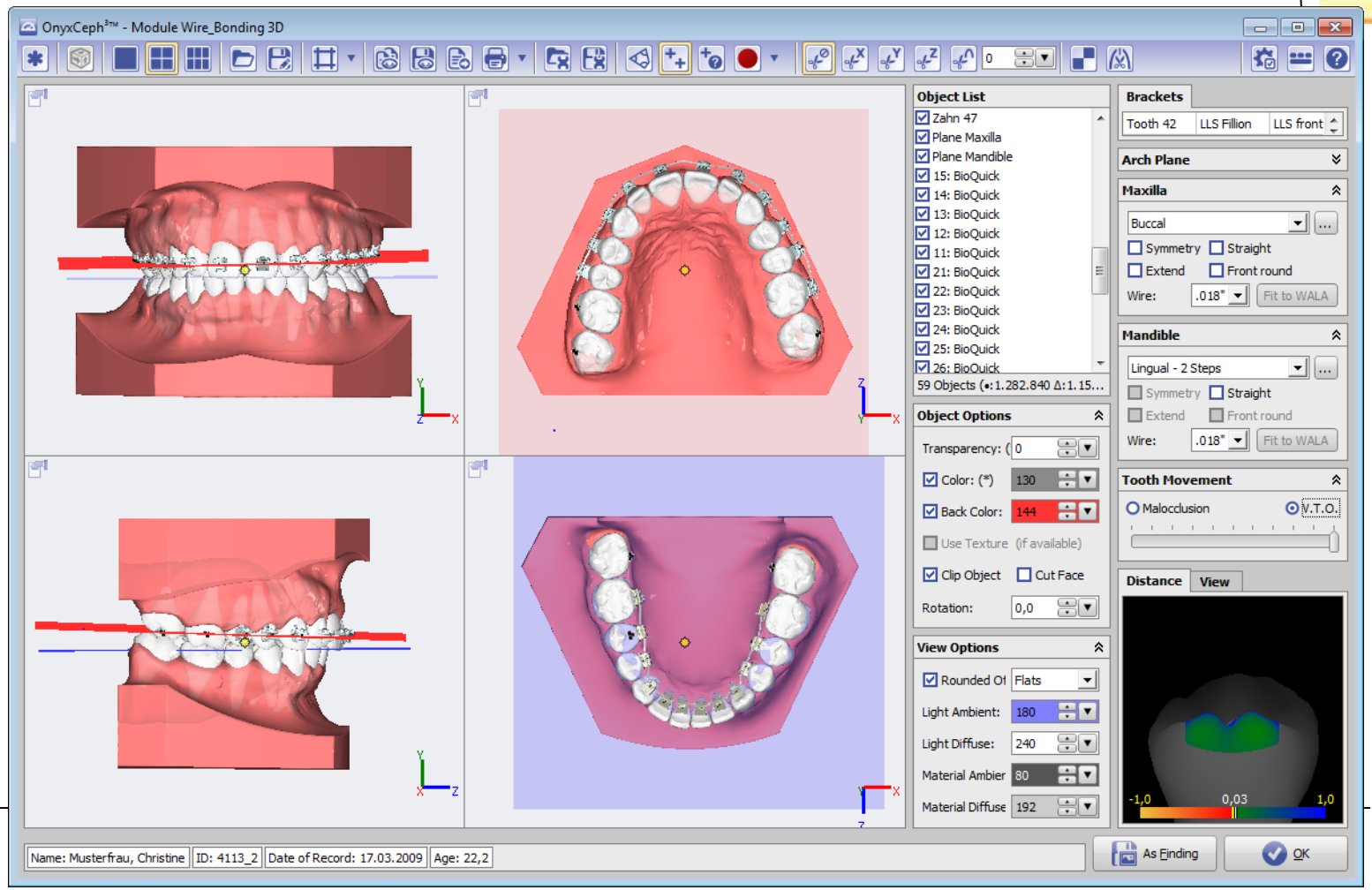




Wire_Bonding: Wire Steps – Step 3

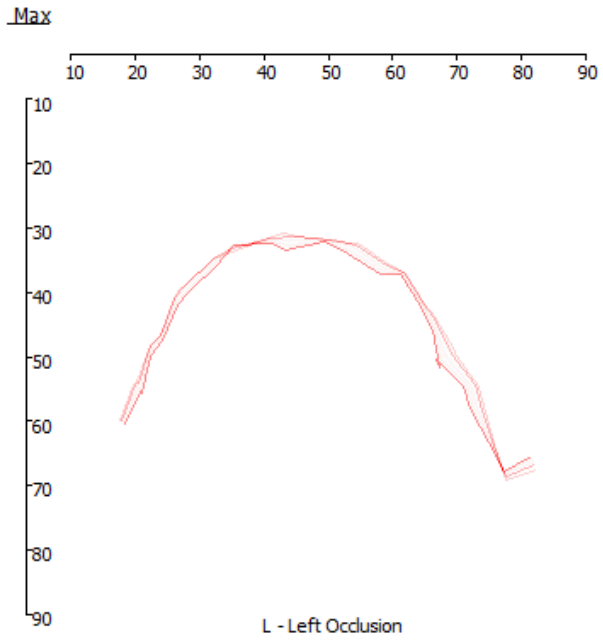
Wire_Bonding

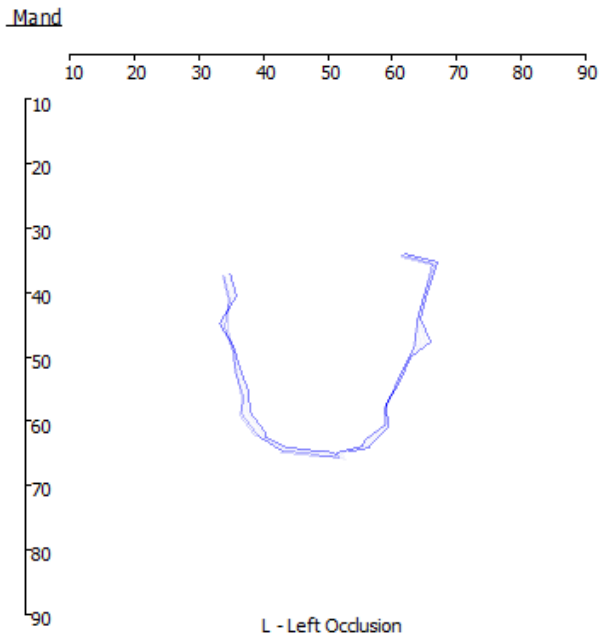




Wire_Bonding: Wire Steps – Final

Wire_Bonding





Wire_Bonding: Wire Steps (2D View)

Wire_Bonding

Add Image
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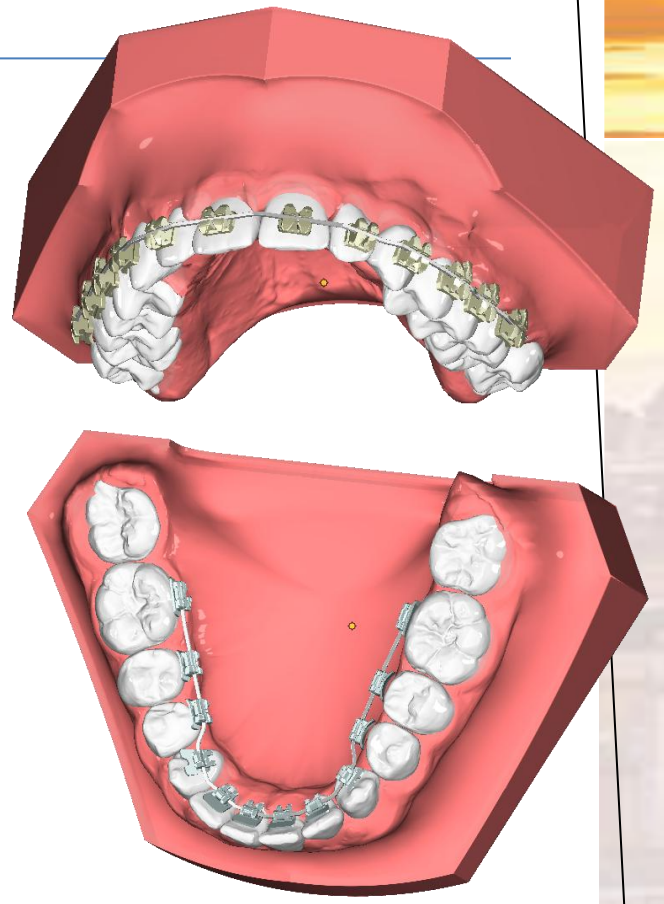
V.T.O.3D
Wire Bonding
Kylix 3D
Bonding Trays 3D
Splint 3D
Bracket Adapt
Aligner 3D
Retainer 3D
Waefer Creation 3D

Wire_Bonding: Example

Digital i/d Bonding

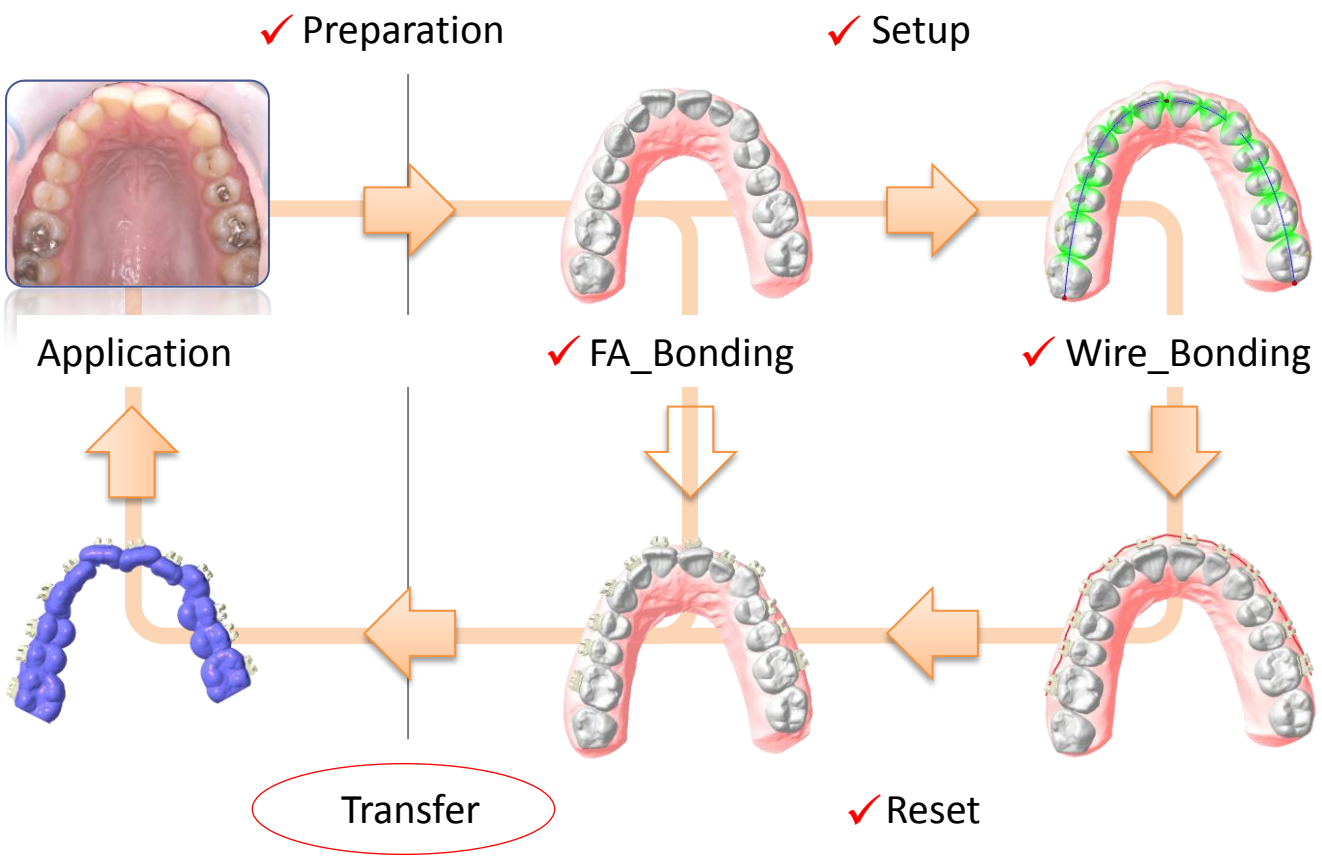


Introduction
Overview OnyxCeph³™

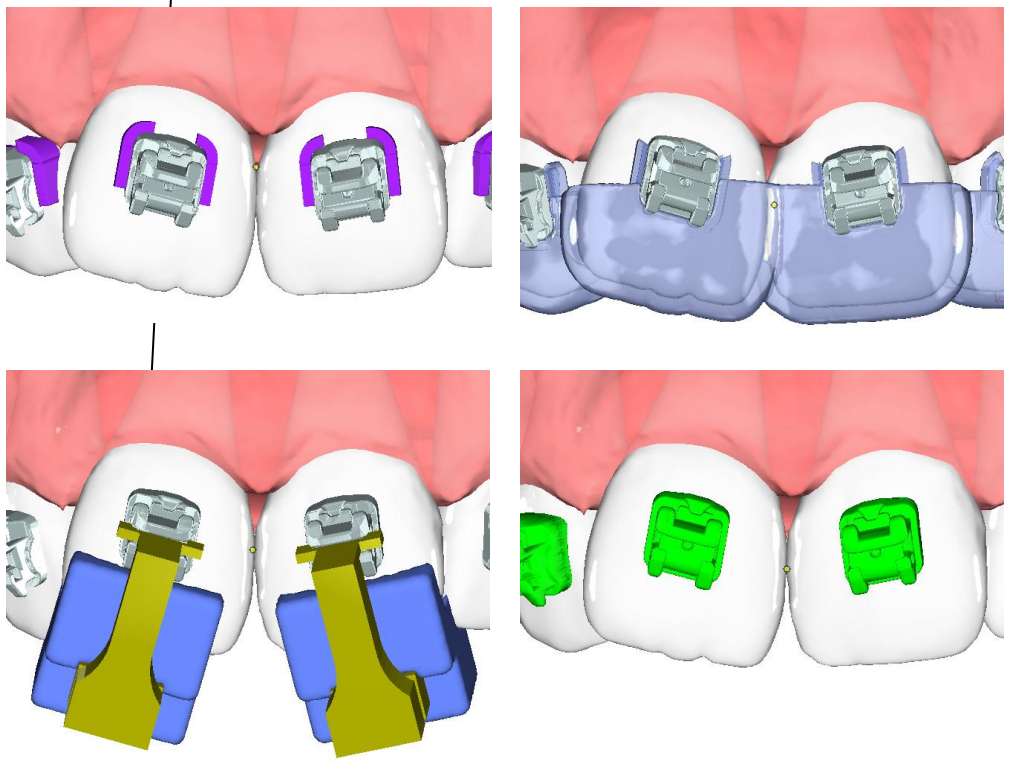
Workflow
FA_Bonding
Wire_Bonding
- Virtual Setup
- Bracket-/Wire-Placement
- **Bracket Position Transfer**
  - Indirect Methods
  - Direct/Mixed Methods

Other Planning Options (Examples)
Summary

Transfer


✓ Preparation
✓ Setup
Application
✓ FA_Bonding
✓ Wire_Bonding
Transfer
✓ Reset

Transfer



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Splint 3D
Bracket Adapt
Aligner 3D
Retainer 3D
Waefer Creation 3D

Transfer

Bracket Position Transfer

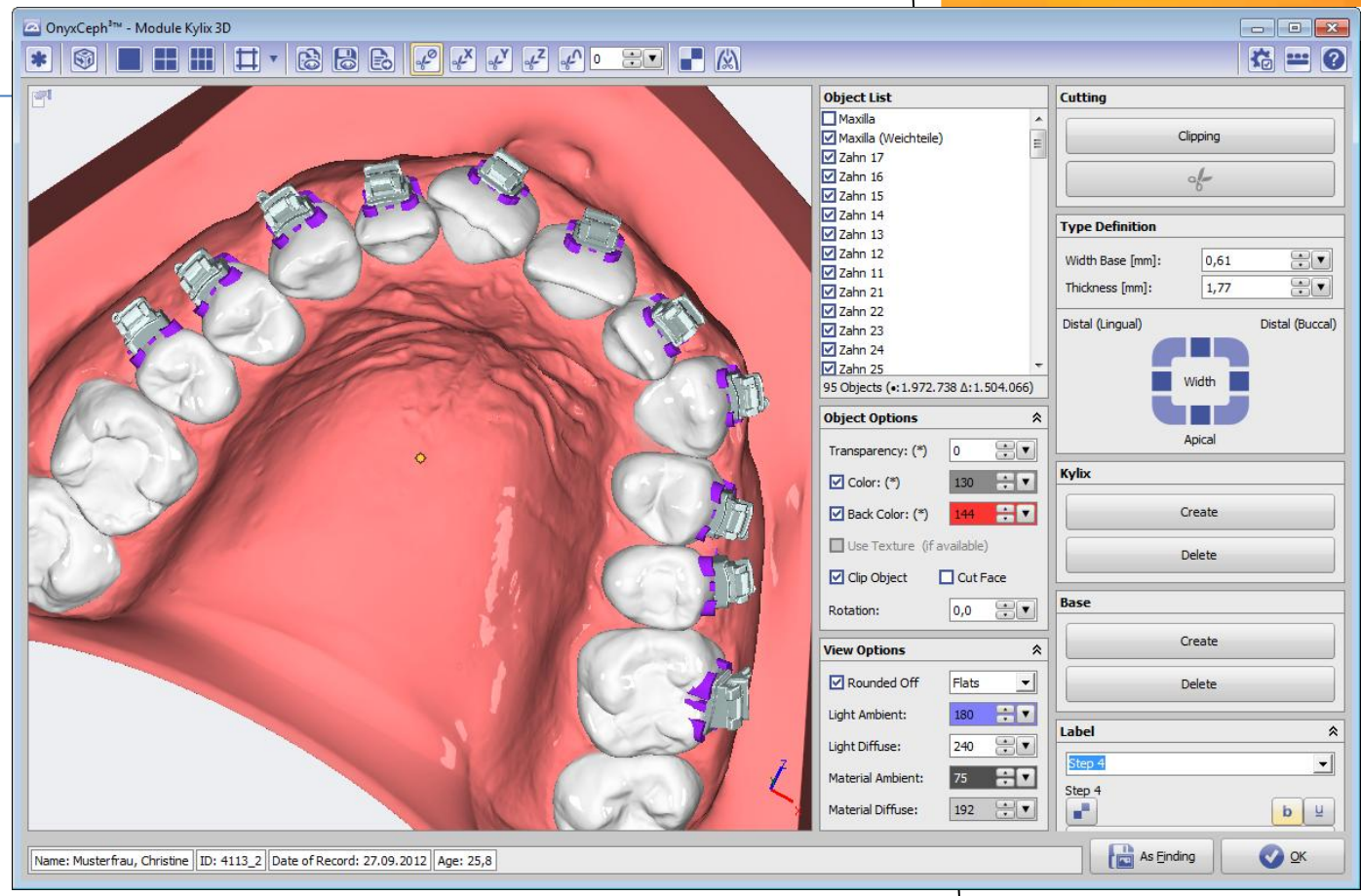
Transfer

Method	Indirect Methods (Model)						Direct Methods (Patient)					
	Position			Alignment			Position			Alignment		
	x	y	z	*a*	*i*	*r*	x	y	z	*a*	*i*	*r*
Kylix_3D												
Individua												
Bosboom												
Orthorobot												
Bonding_Trays_3D												
Splint_3D												
Bracket_Adapt_3D												

(x, y, z) – Position; (*a*, *i*, *r*) - Alignment

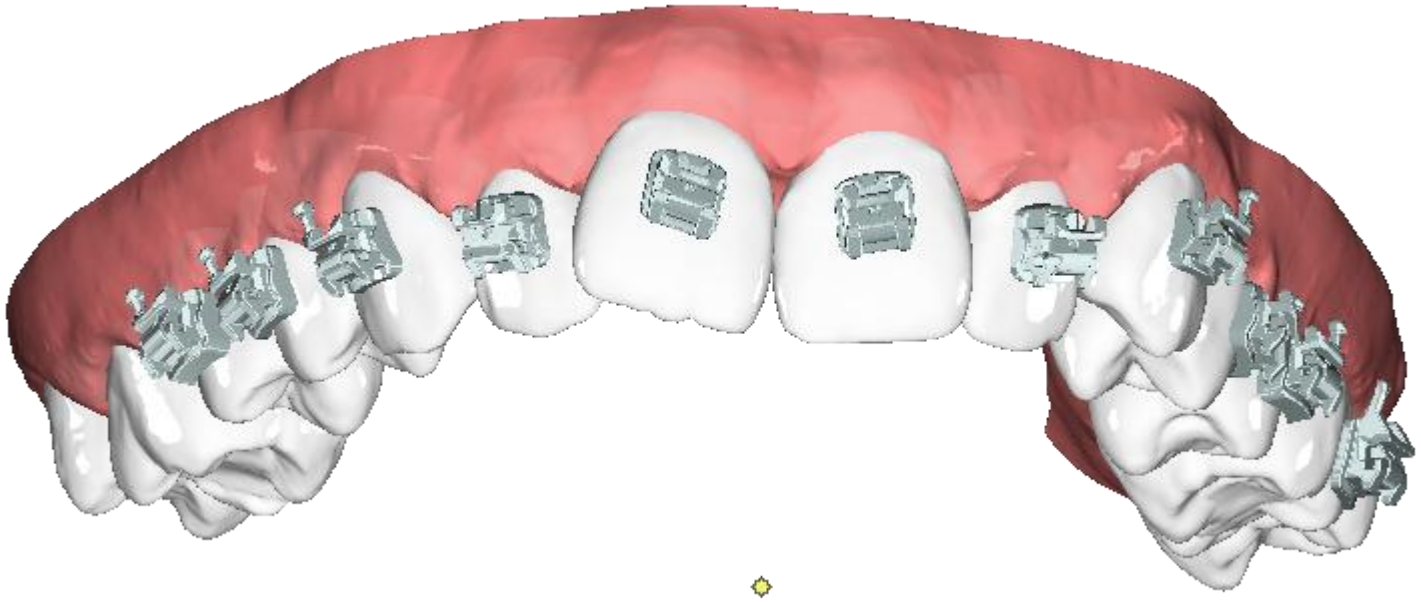
Transfer

- Add Image
- Adjust Image
- Digitize
- Combine
- Mirror
- Treatment Simulation 3D
- Image Comparison
- Cast Adjust
- Segmentation
- FA_Bonding
- V.T.O.3D
- Wire Bonding
- **Kylix 3D**
- Bonding Trays 3D
- Splint 3D
- Bracket Adapt
- Aligner 3D
- Retainer 3D
- Waefer Creation 3D



Module Kylix

Transfer



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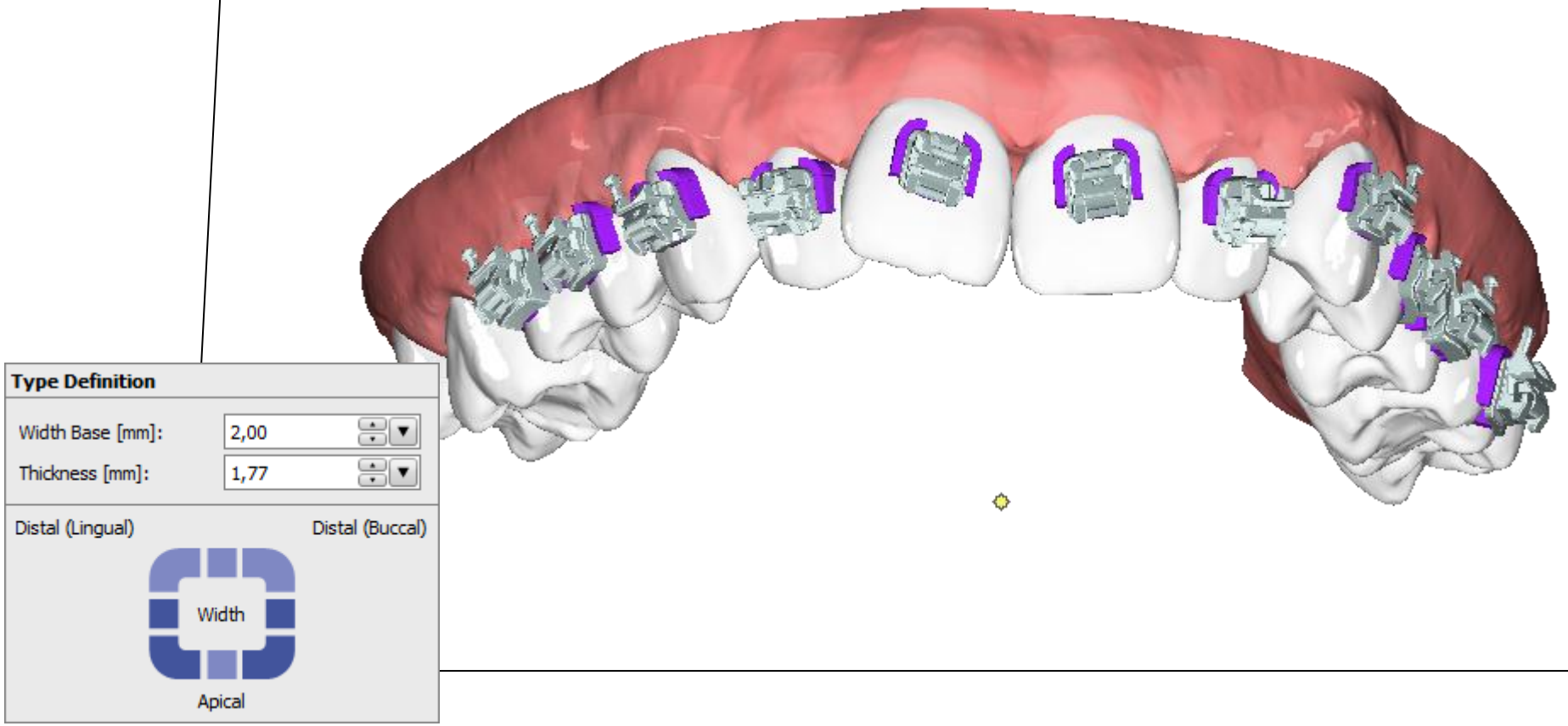
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Thickness [mm]:
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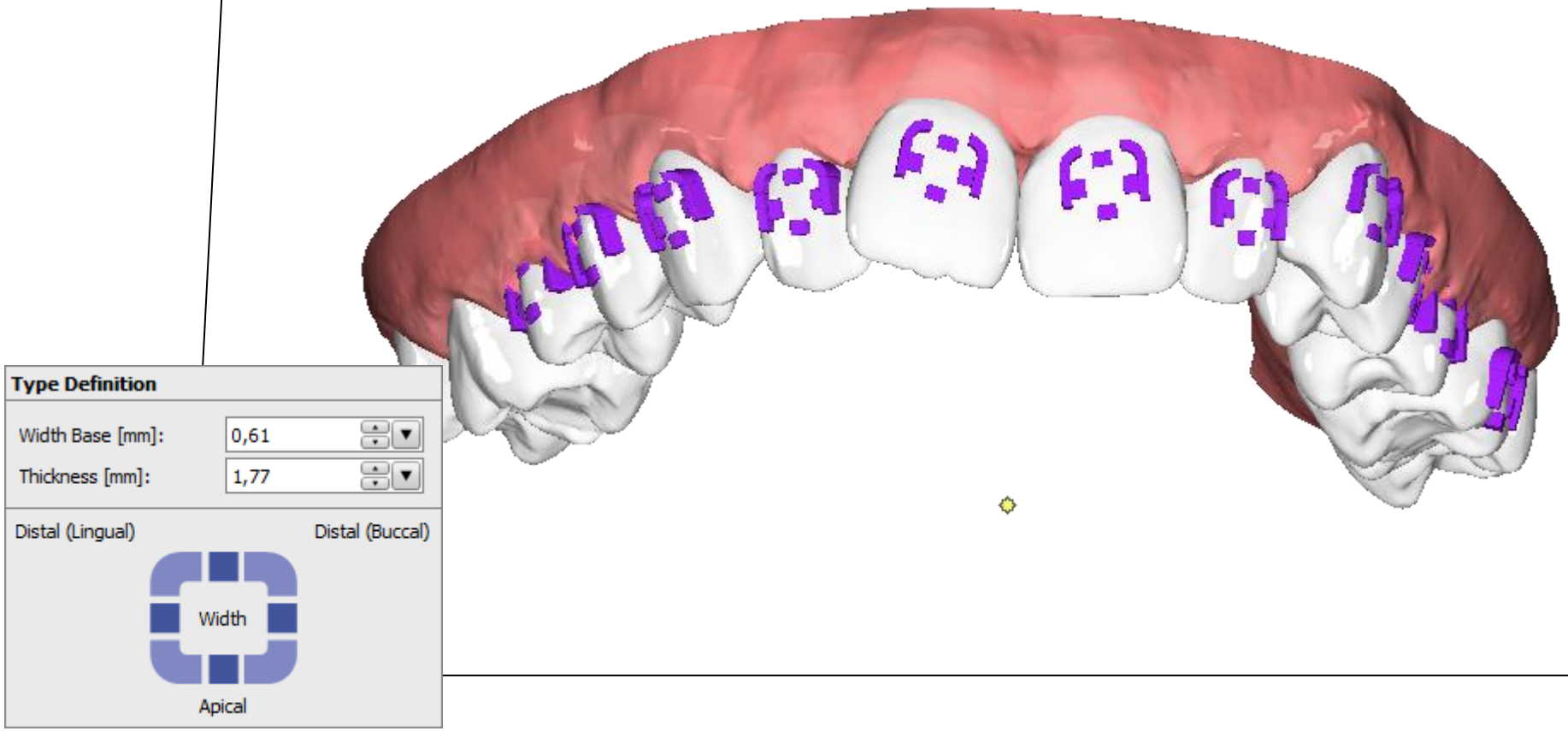
Distal (Lingual)
Distal (Buccal)
Width
Apical

Transfer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Distal (Lingual)
Distal (Buccal)
Width
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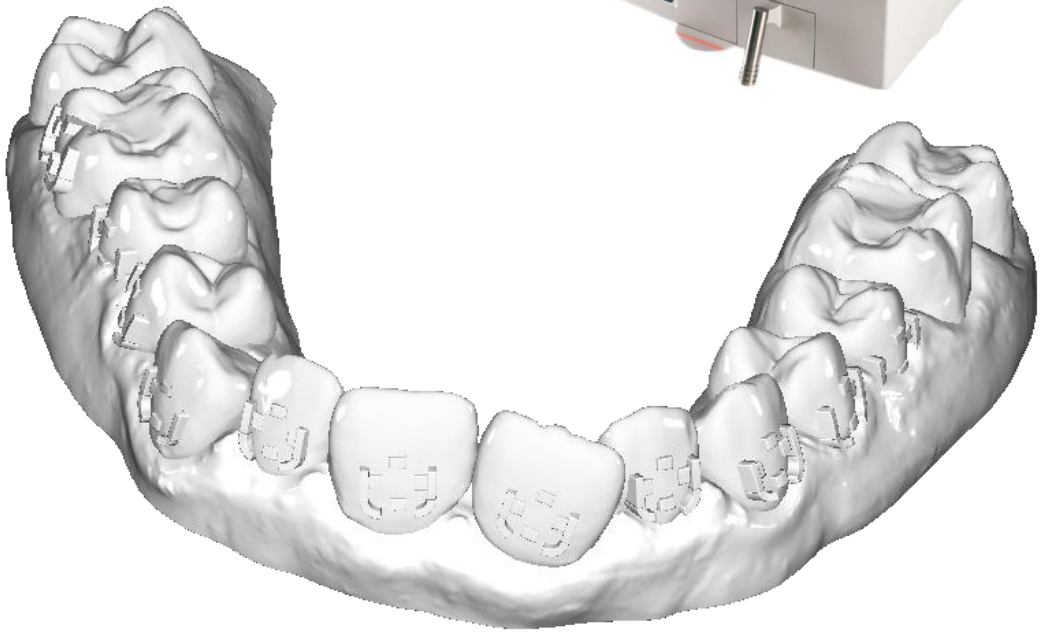

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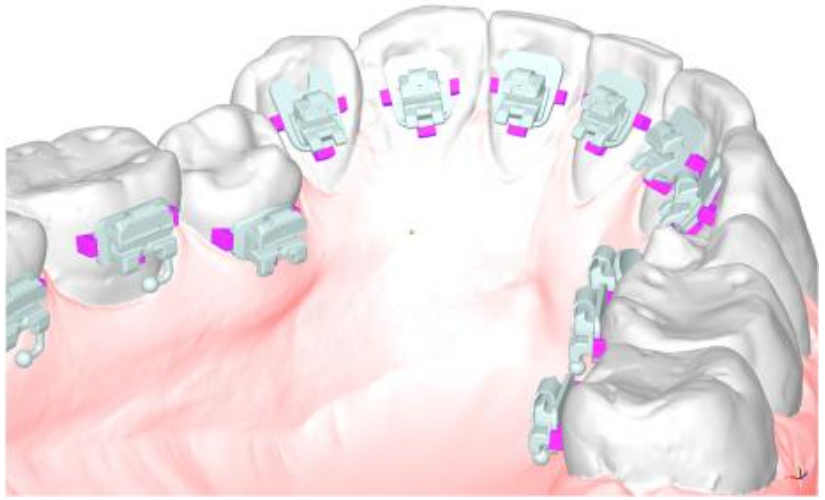

Transfer

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Splint 3D
Bracket Adapt
Aligner 3D
Retainer 3D
Waefer Creation 3D

Transfer

Transfer

Method	Indirect Methods (Model)						Direct Methods (Patient)					
	Position			Alignment			Position			Alignment		
	x	y	z	*a*	*i*	*r*	x	y	z	*a*	*i*	*r*
Kylix_3D												
Individua												
Excent												
Orthorobot												
Bonding_Trays_3D												
Splint_3D												
Bracket_Adapt_3D												

(x, y, z) – Position; (*a*, *i*, *r*) - Alignment

Transfer

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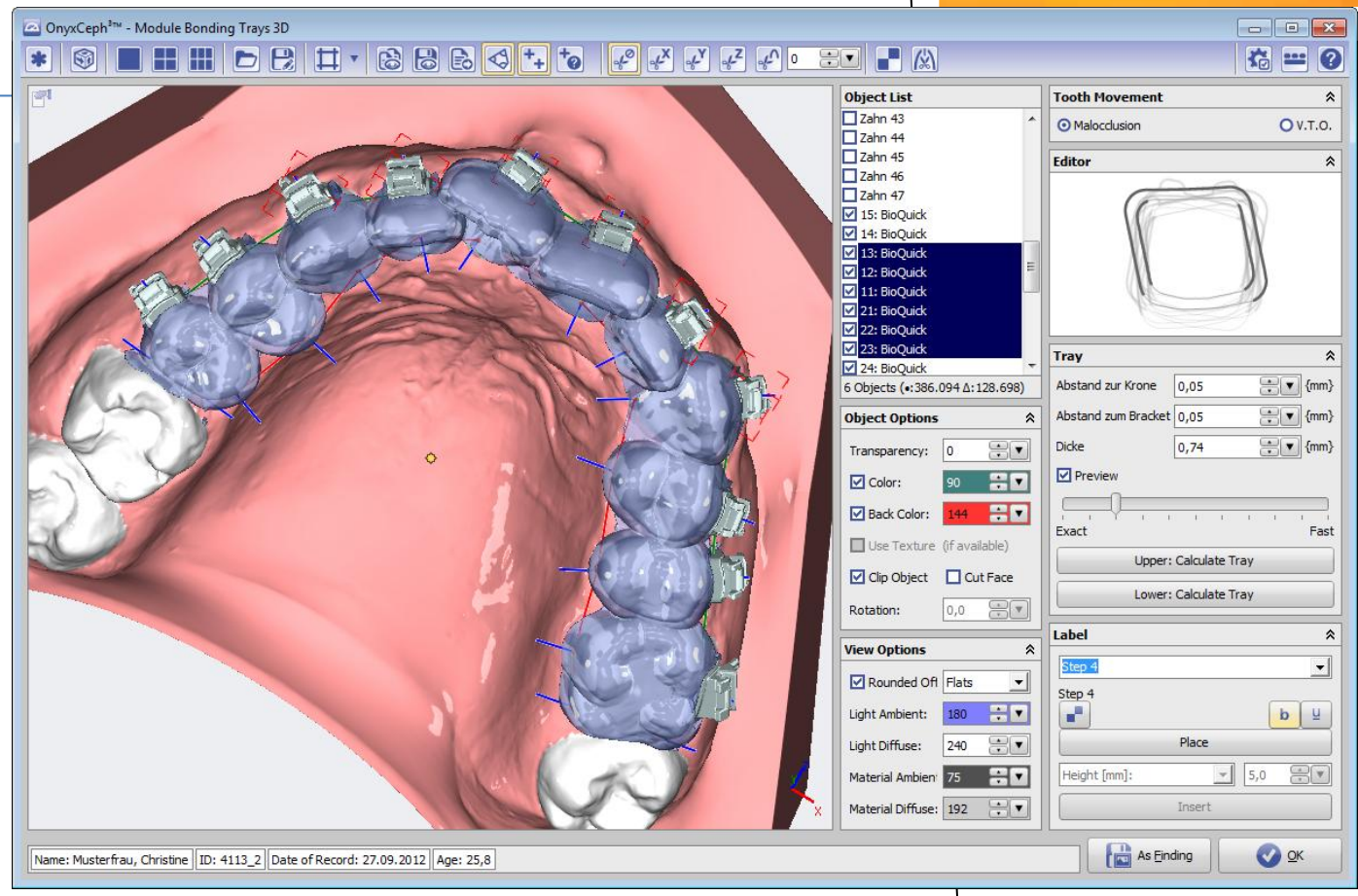
- **Bonding Trays 3D**
- Splint 3D
- Bracket Adapt
- Aligner 3D
- Retainer 3D
- Waefer Creation 3D



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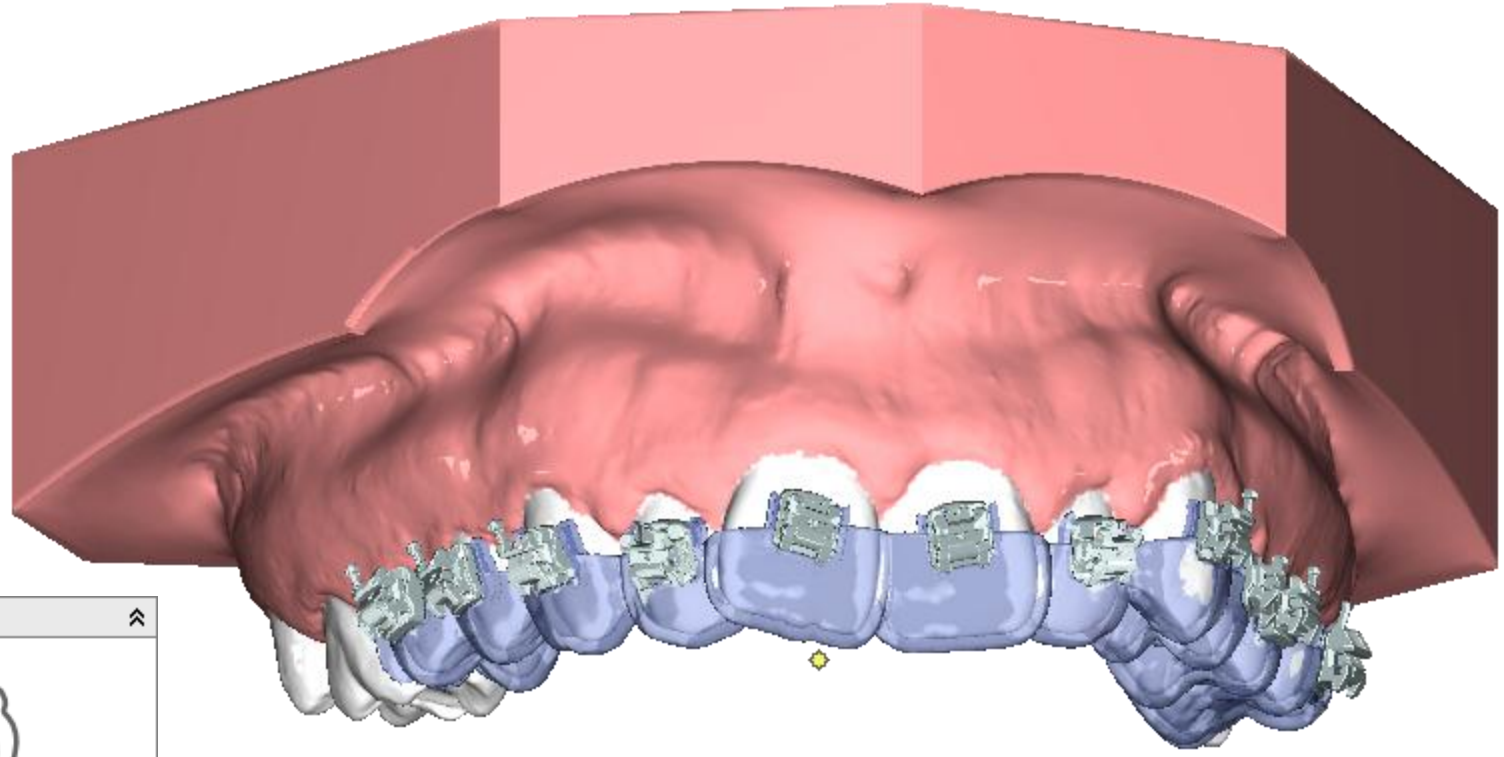

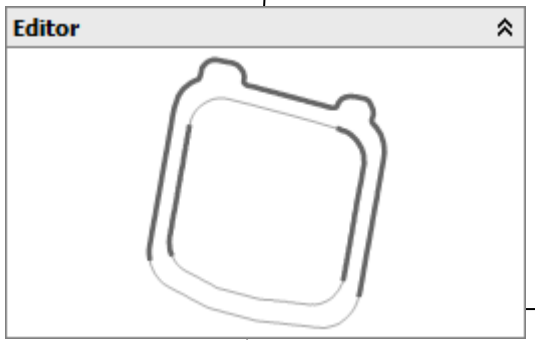

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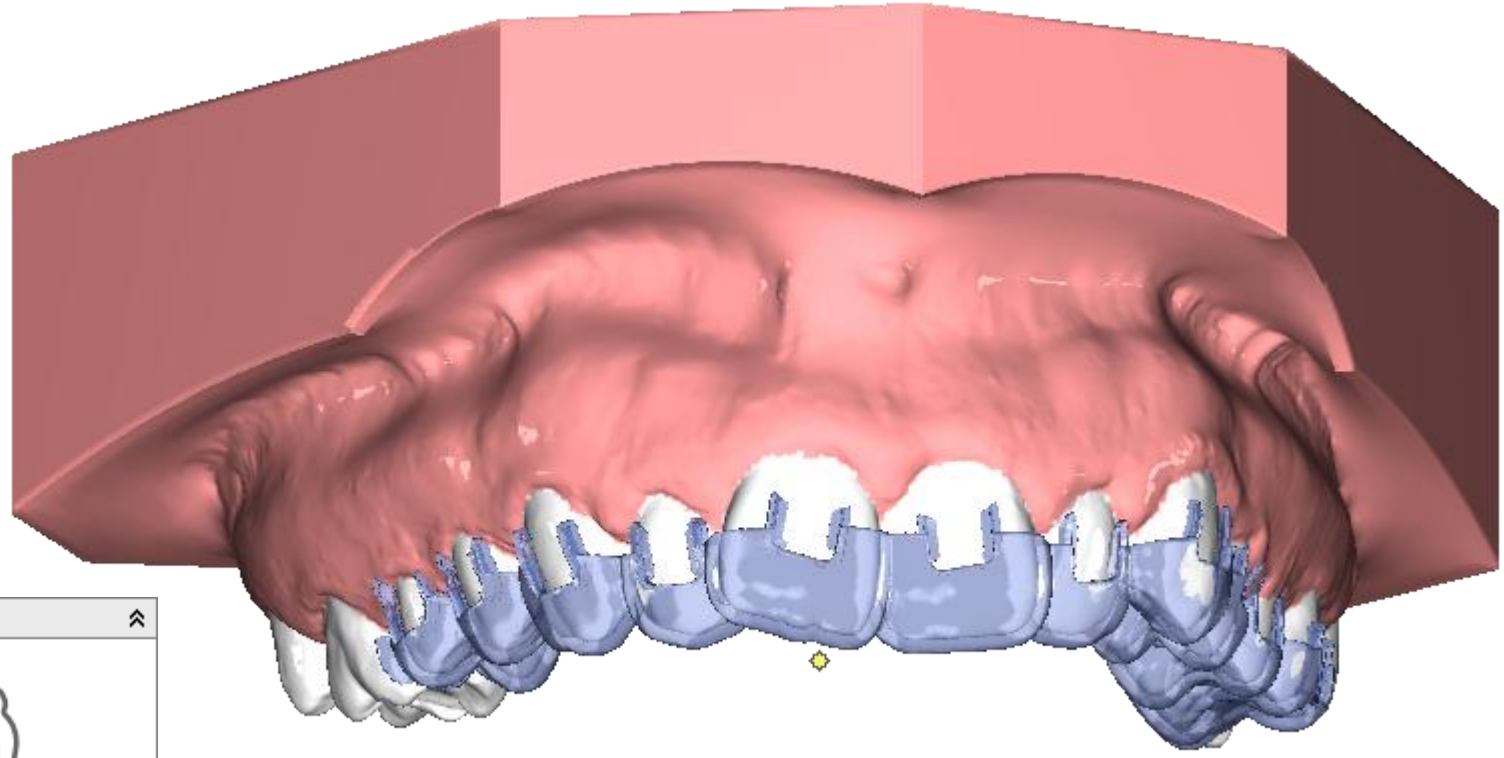

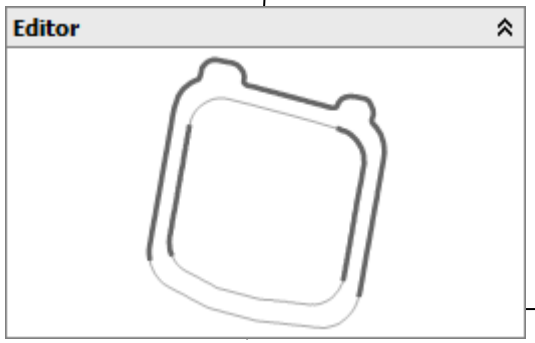

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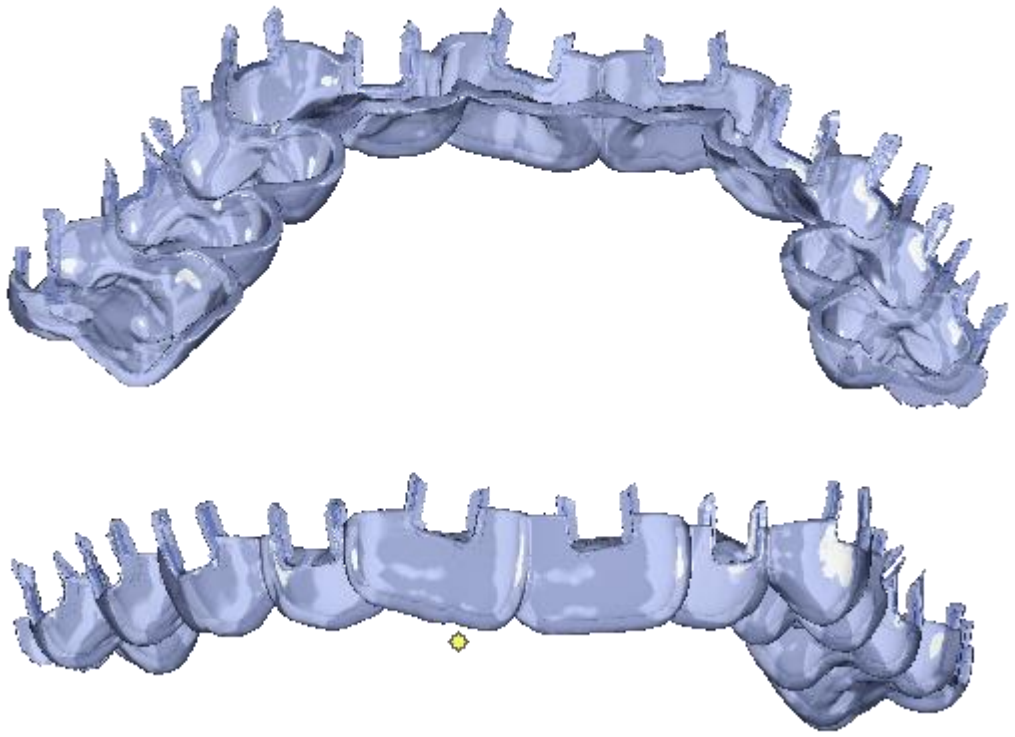

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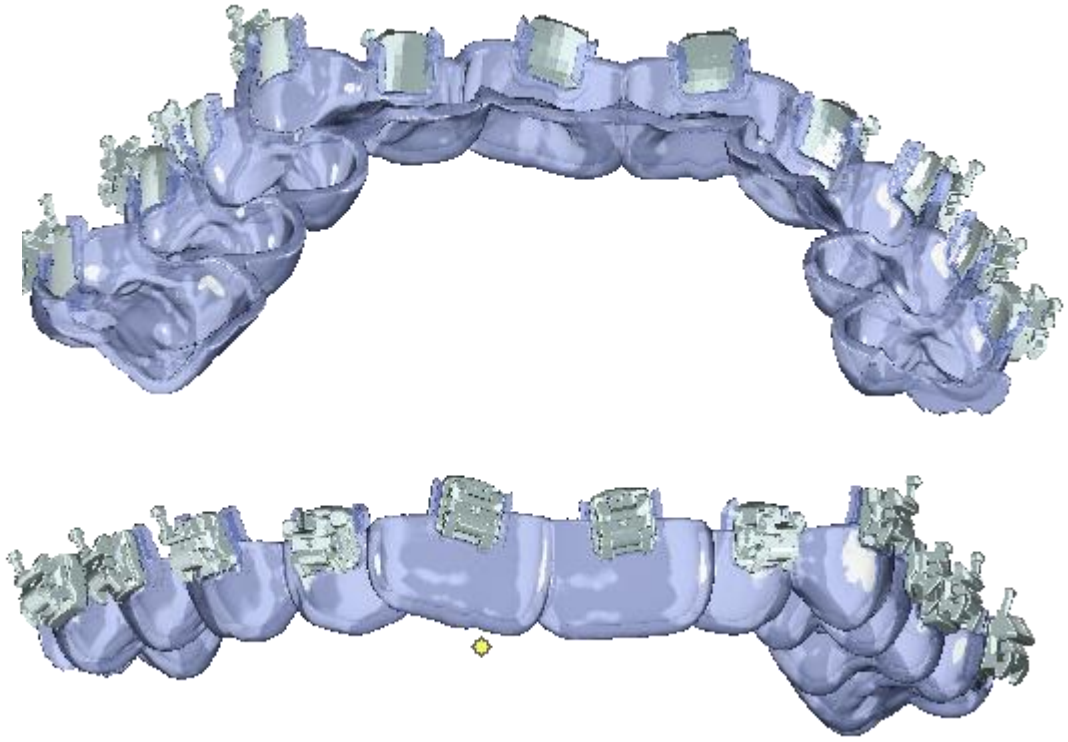

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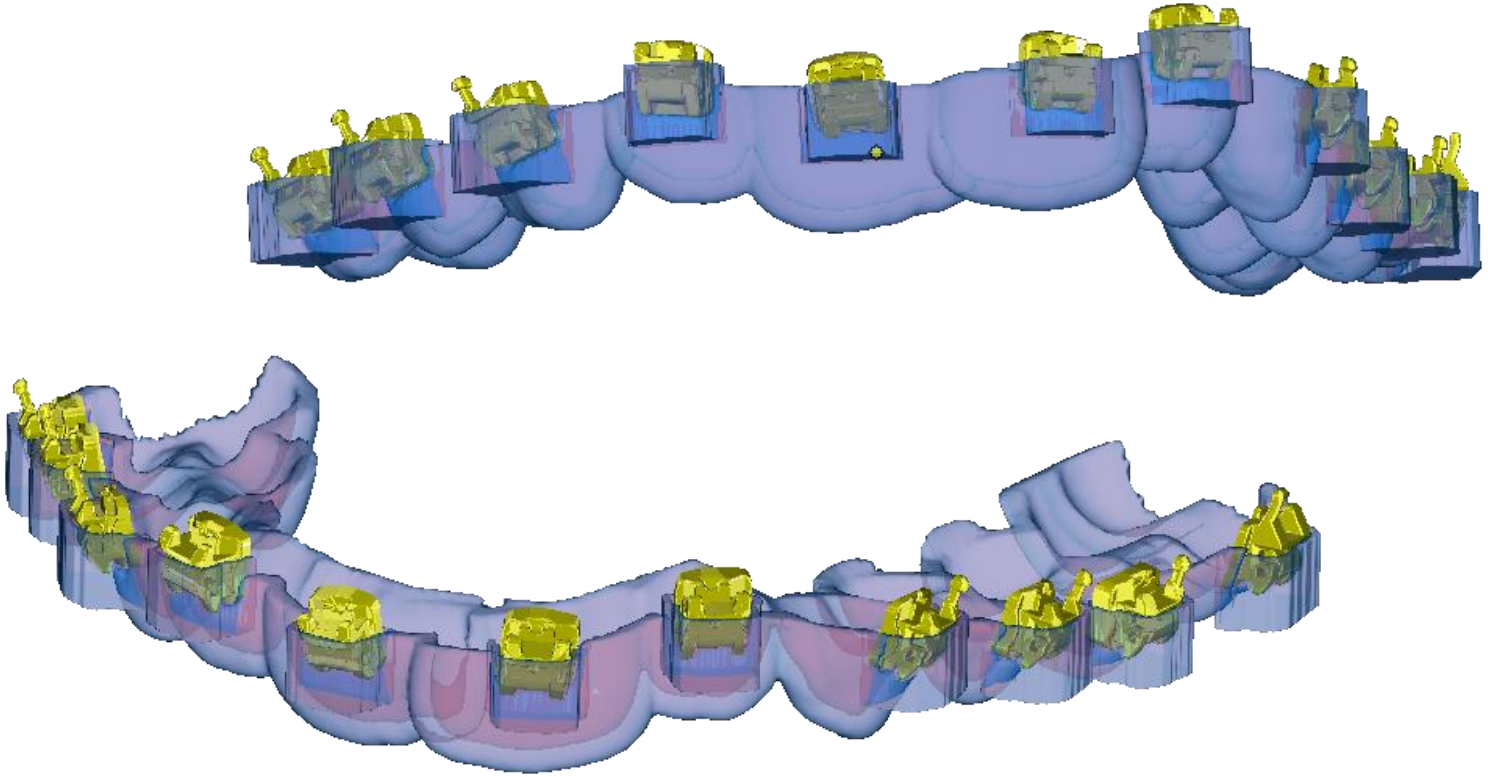
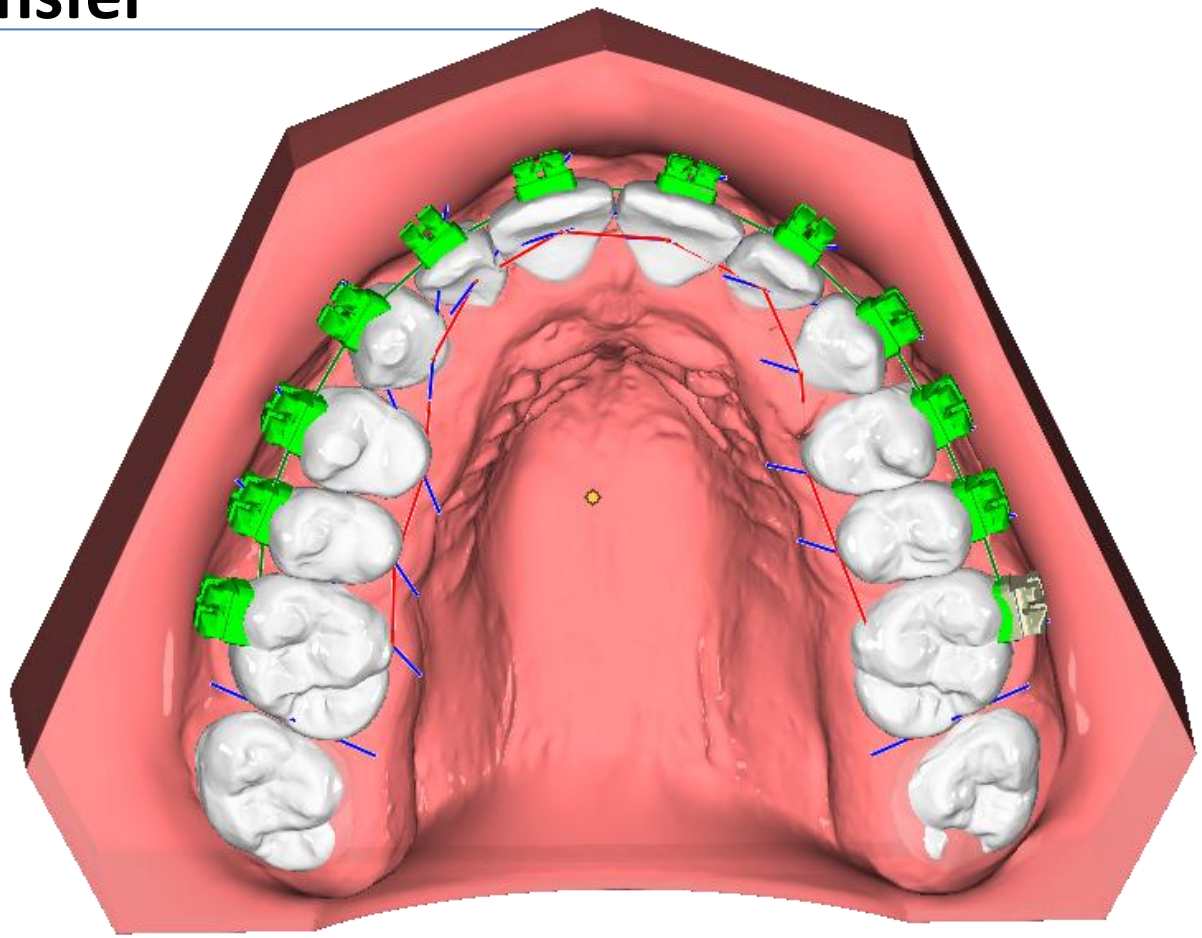


Transfer



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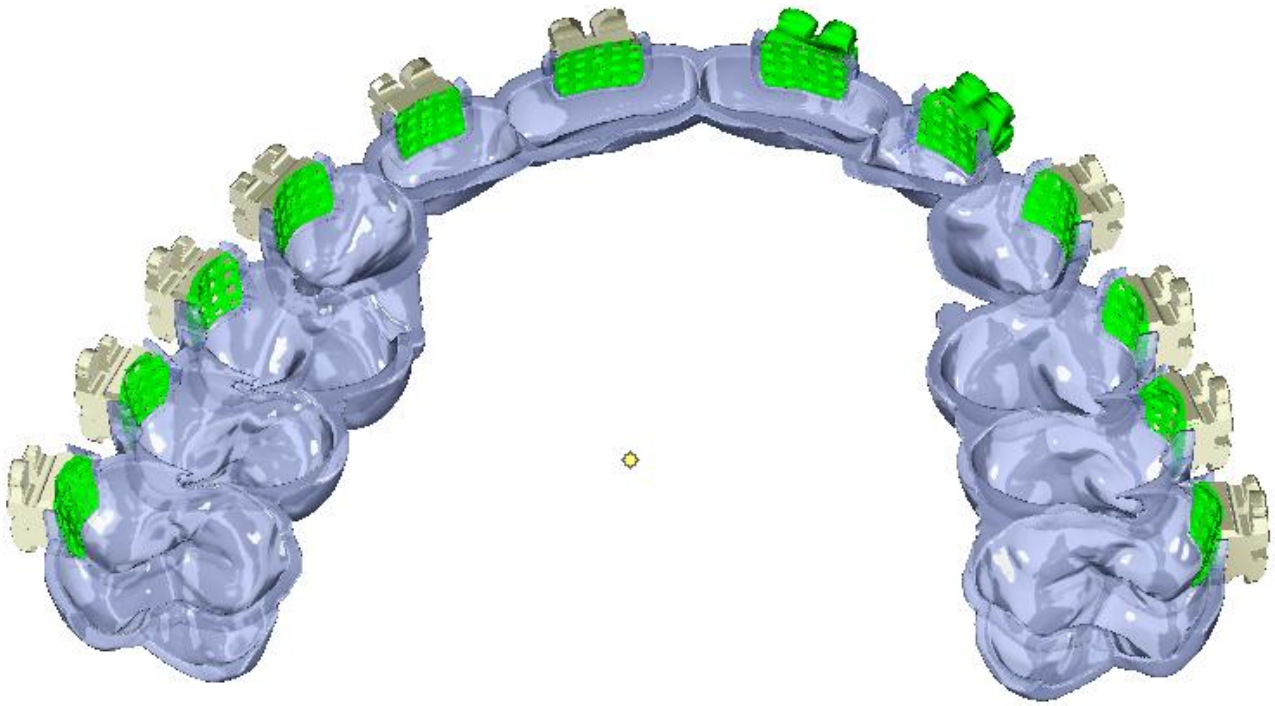

Transfer

Transfer

Add Image
Adjust Image
Digitize
Combine
Mirror
Treatment Simulation 3D
Image Comparison
Cast Adjust
Segmentation
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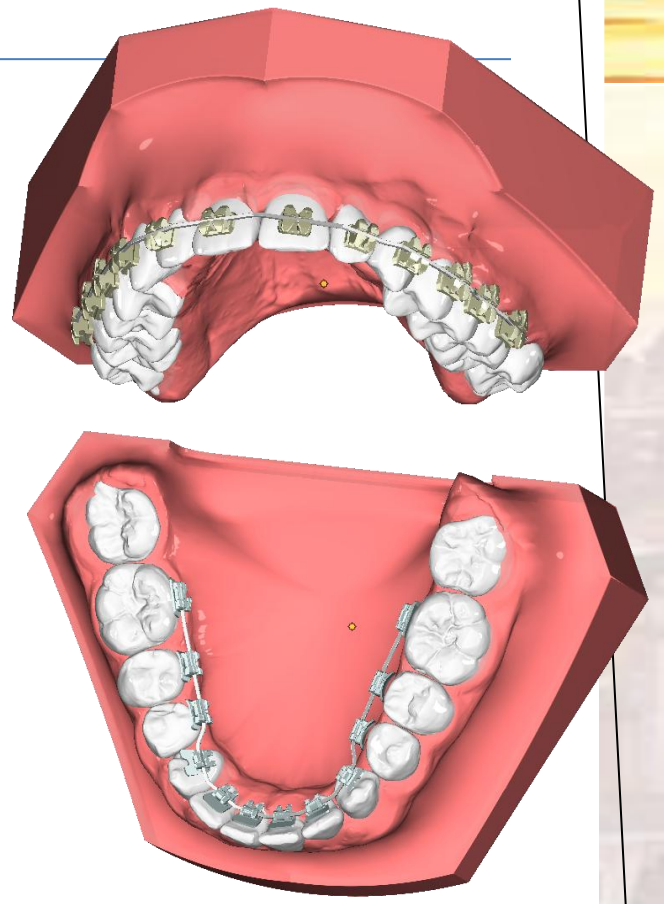
V.T.O.3D
Wire Bonding
Kylix 3D
Bonding Trays 3D
Splint 3D
Bracket Adapt
Aligner 3D
Retainer 3D
Waefer Creation 3D

Transfer

Digital i/d Bonding



Introduction
Overview OnyxCeph³™

Workflow
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- Direct/Mixed Methods

- **Other Planning Options** (Overview)

Summary

Other Options

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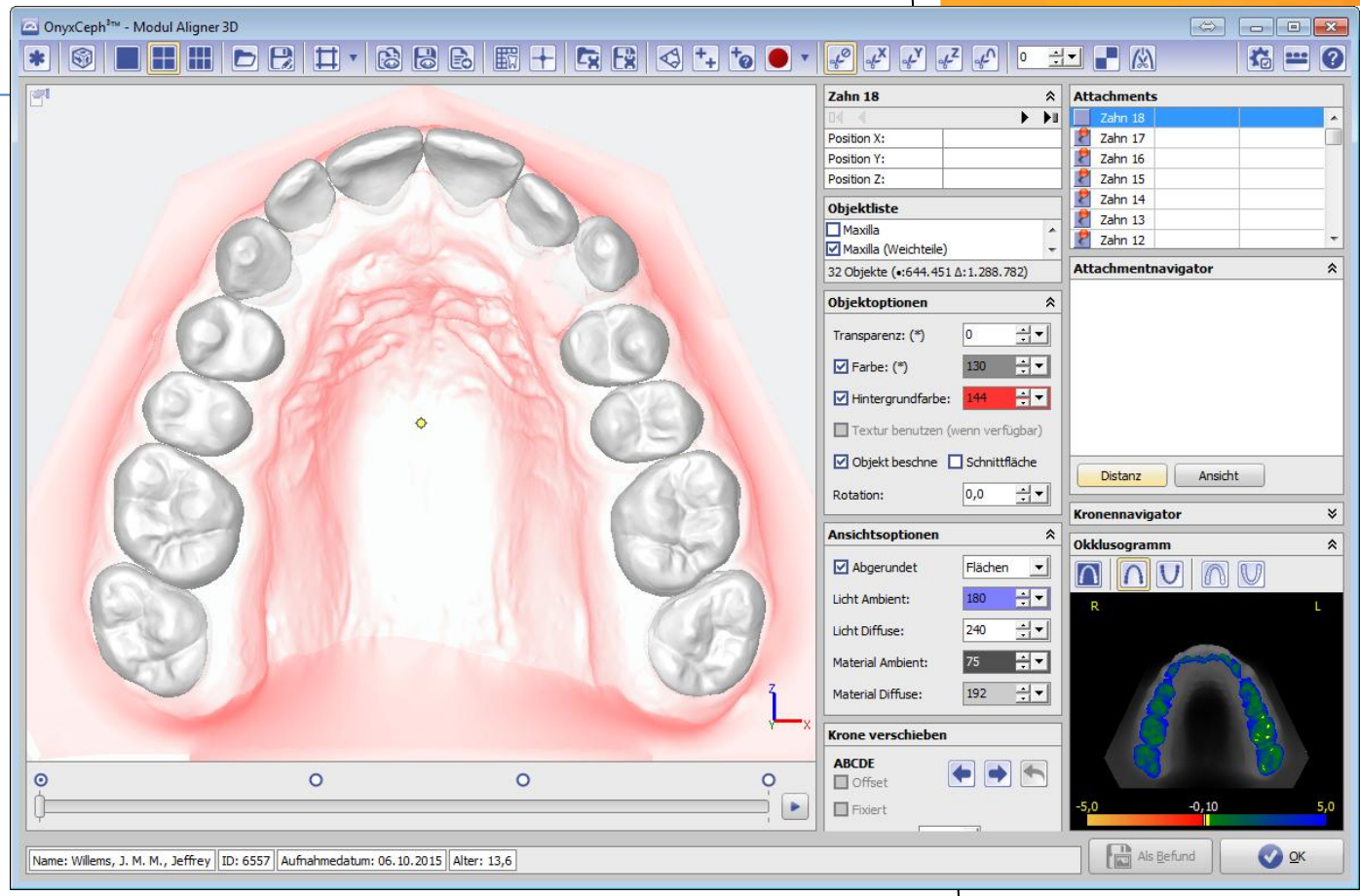

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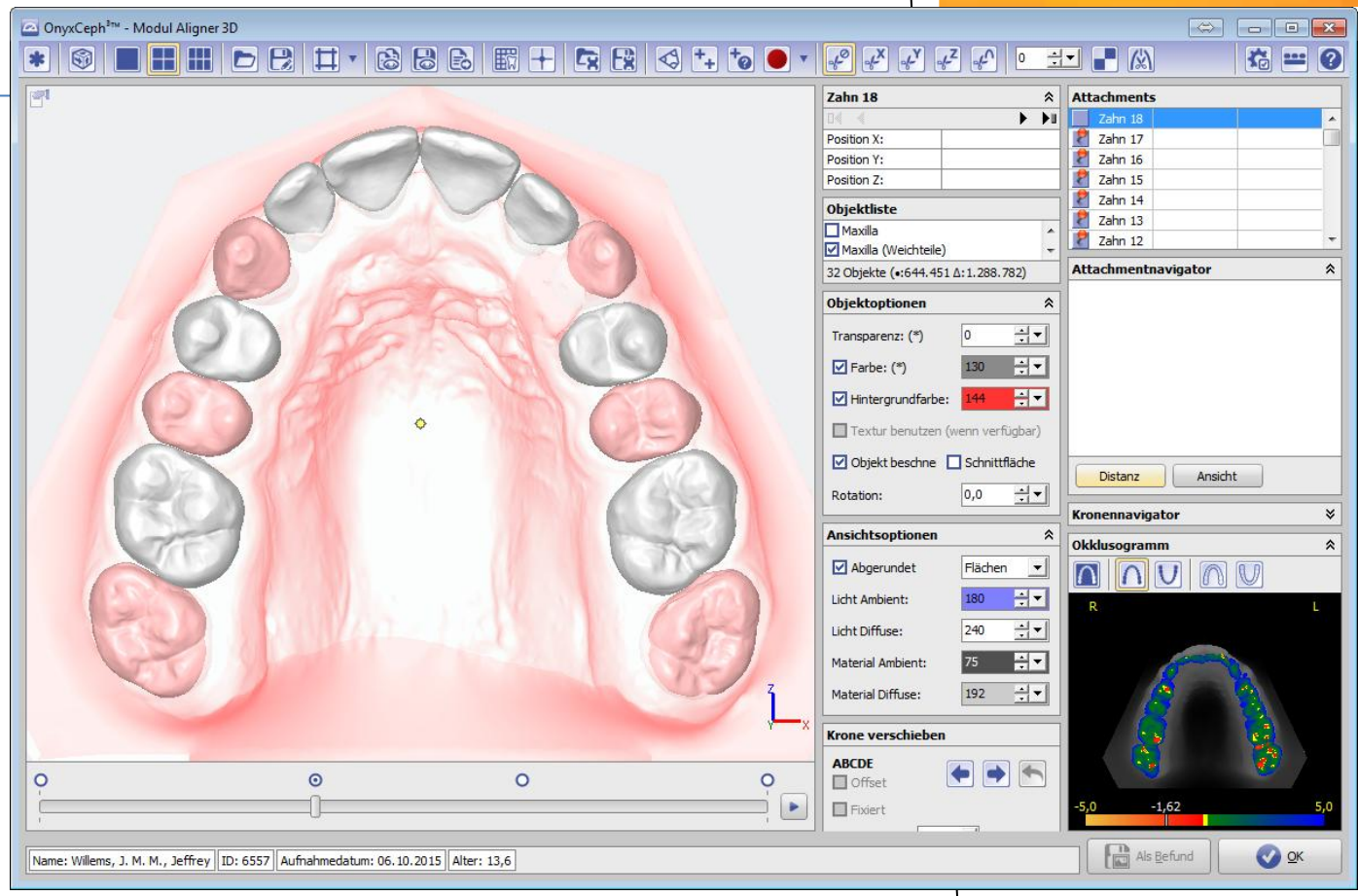

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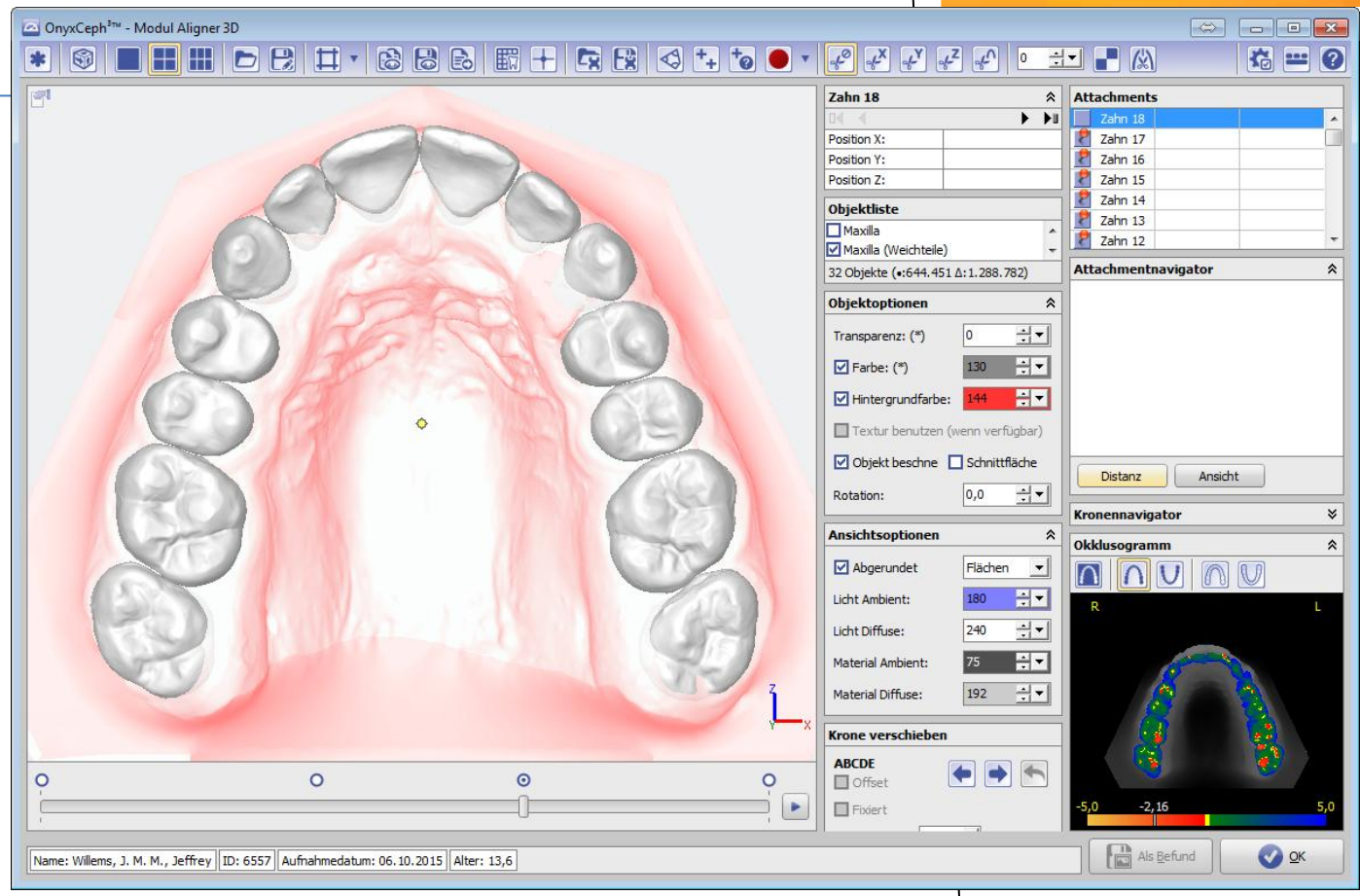

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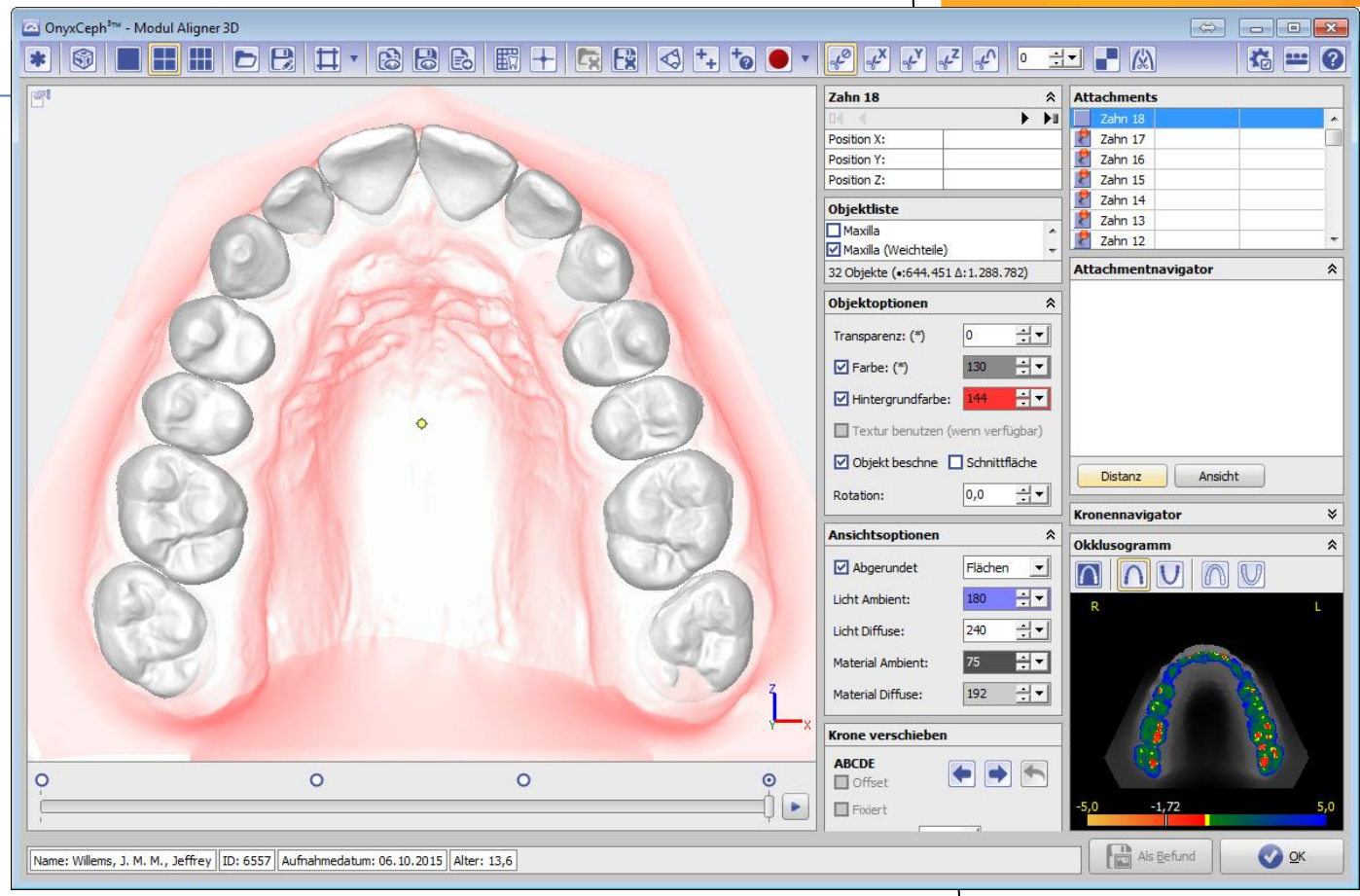

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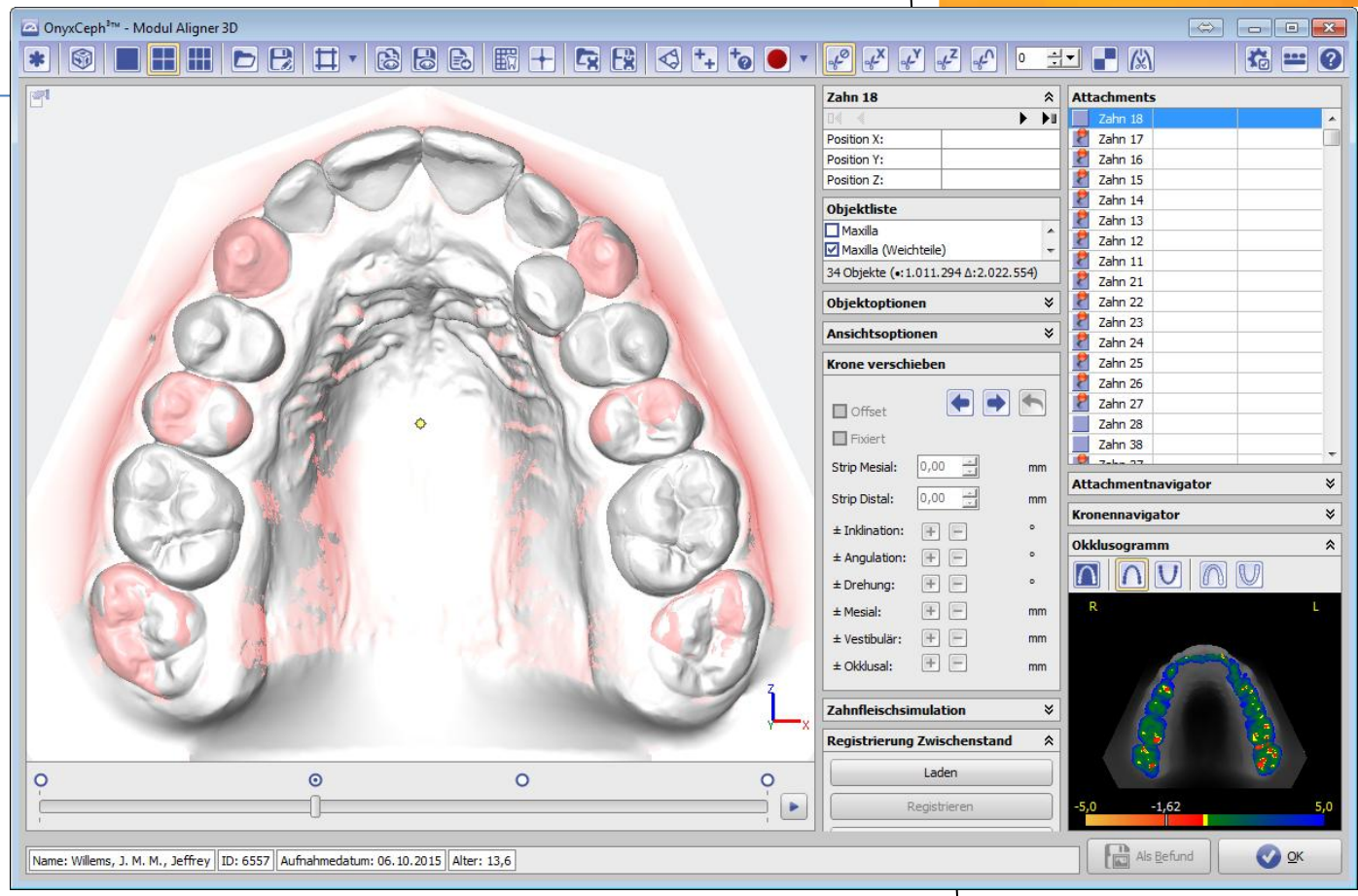

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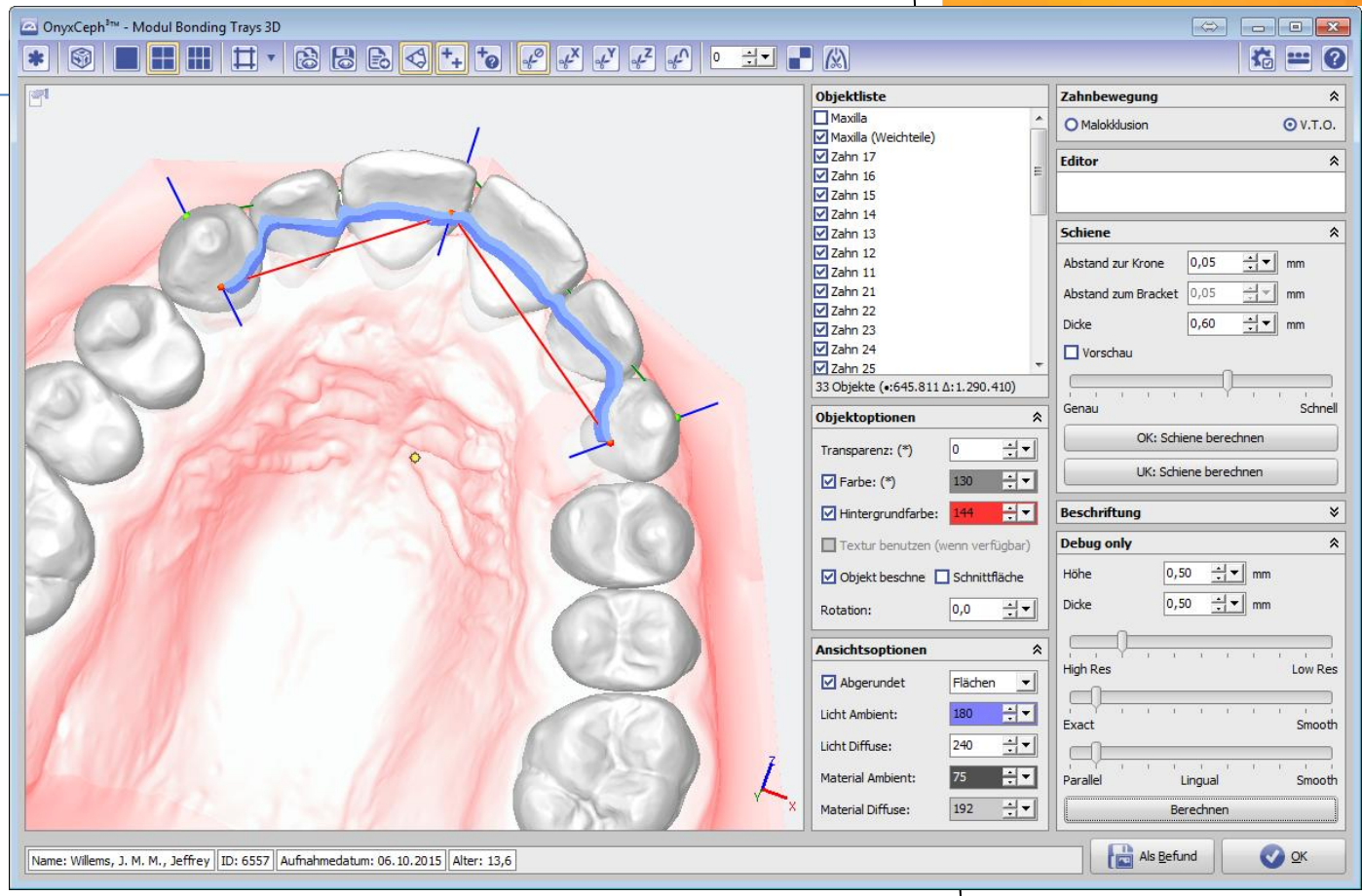

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Retainer 3D

3D Imaging

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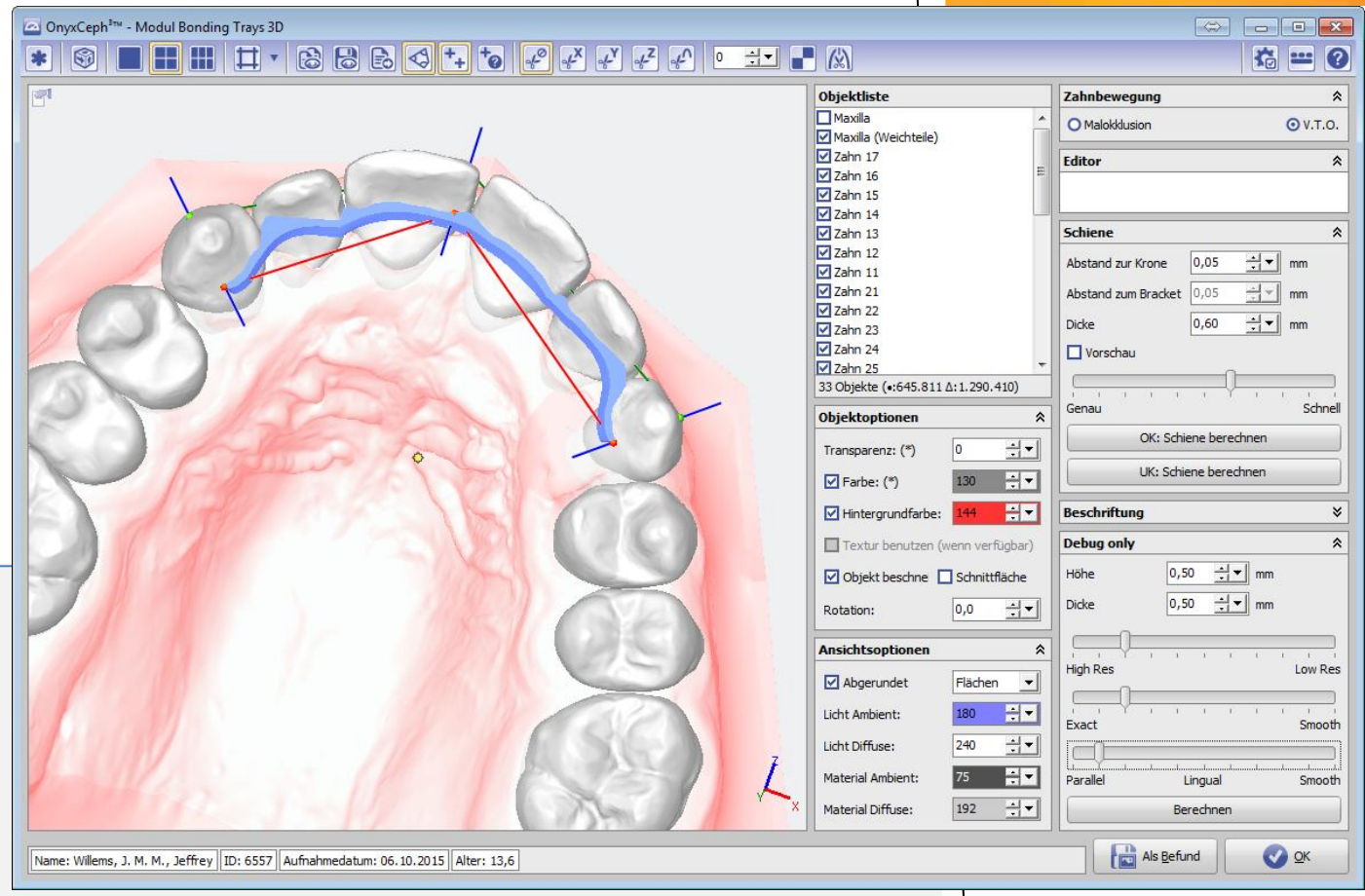

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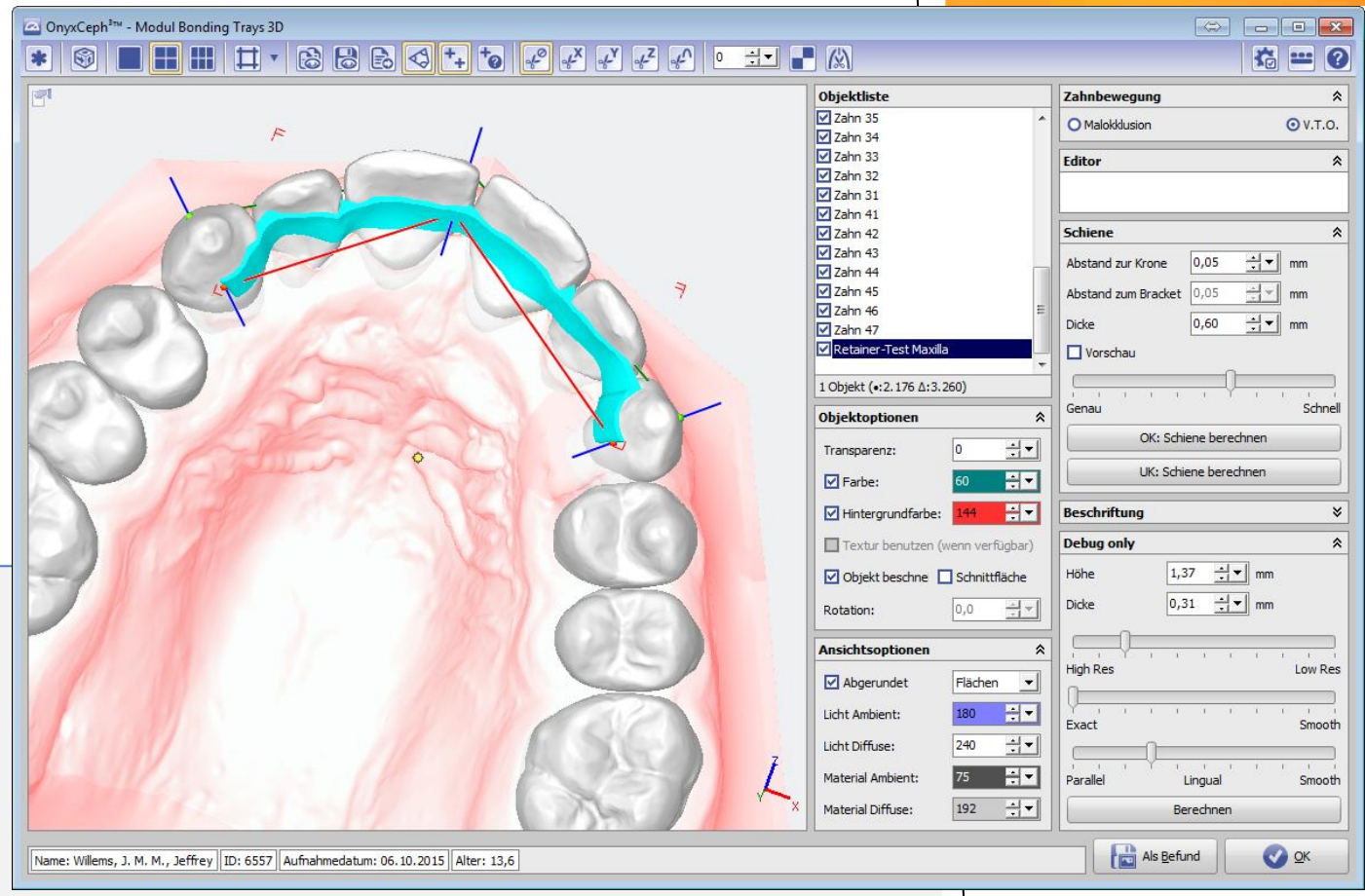

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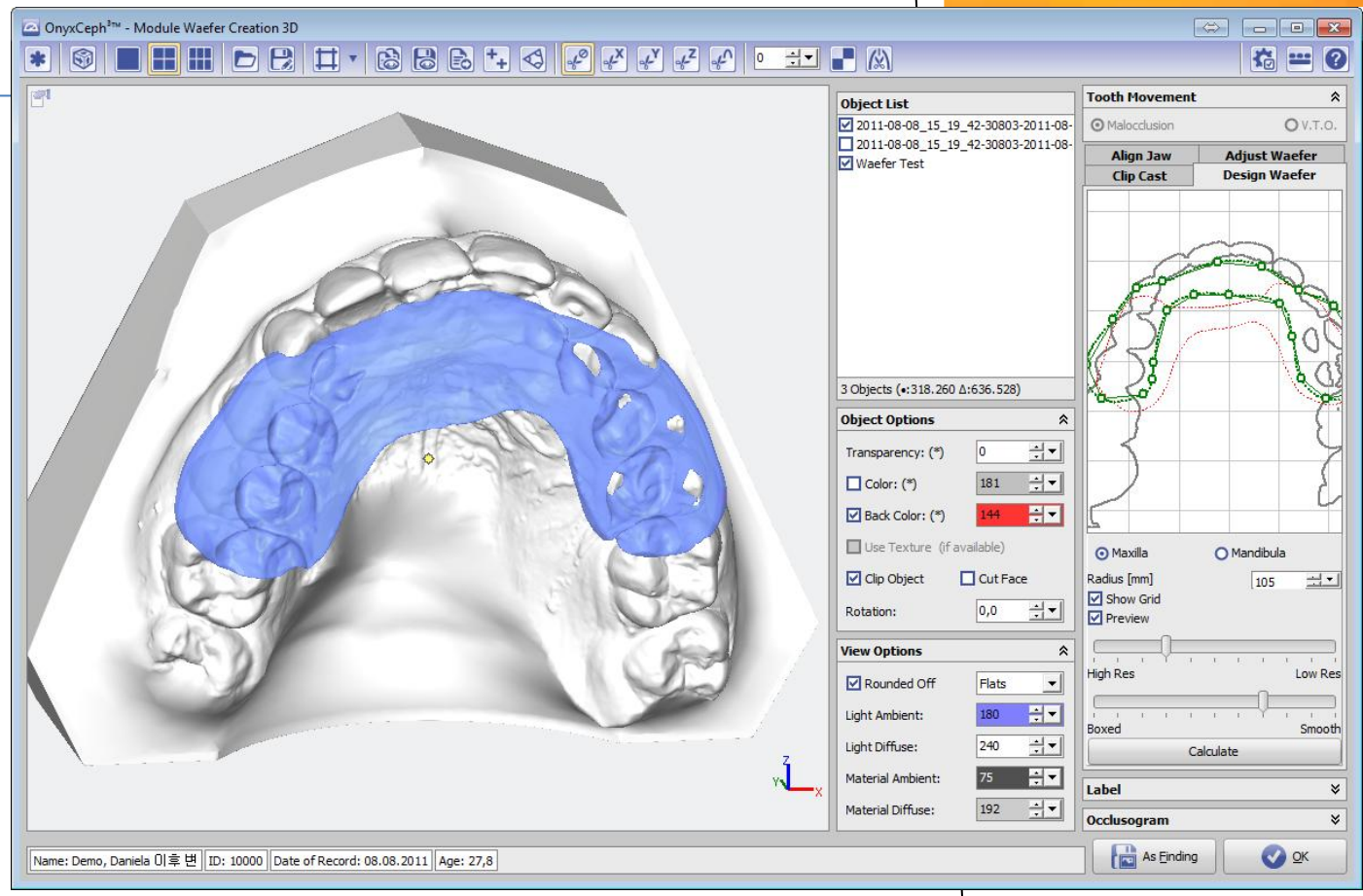

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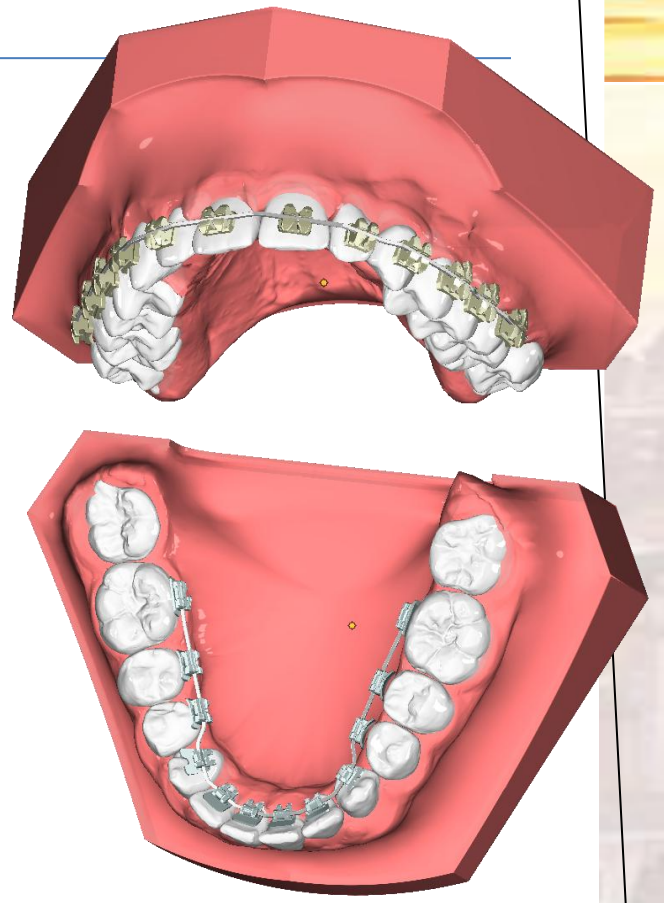
Digital i/d Bonding



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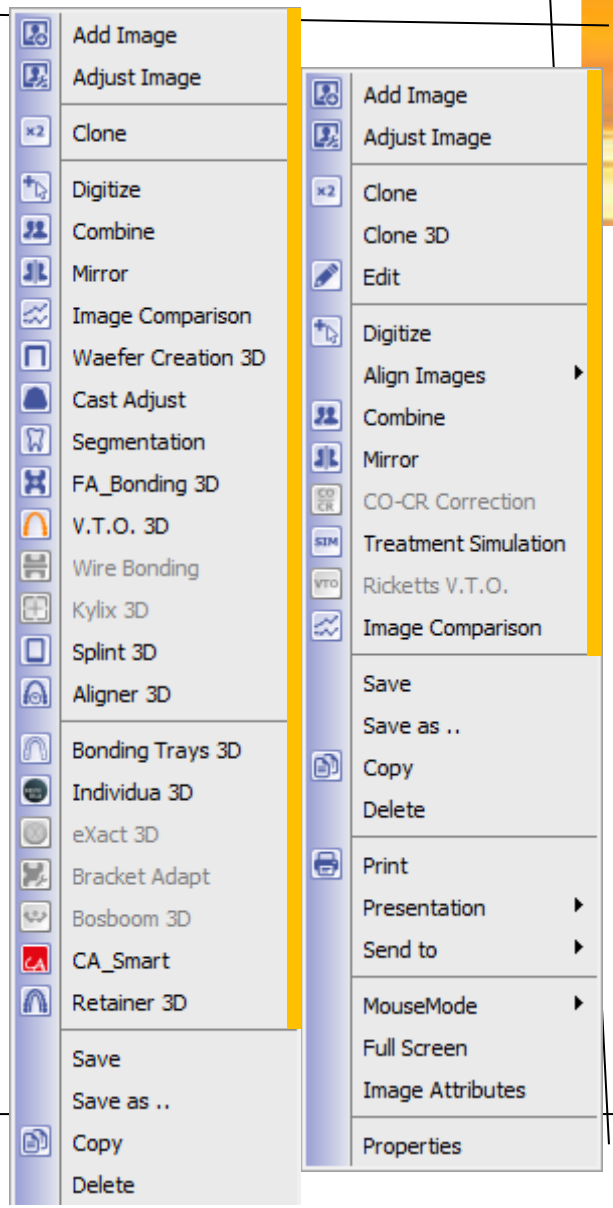
Summary

Areas of Application:

- Archiving
- Diagnostics
- Treatment Planning
- Patient Education
- Communication

Expectations:

- Savings
- Facilities
- Improvements



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13rd A.I.O.T. National Congress

Thank You !

June 3rd – June 4th 2016