Interdisciplinary Oral Rehabilitation

Abstract

This case illustrates a complex oral rehabilitation of high difficulty that required a fully interdisciplinary approach — from orthodontics and orthognathic surgery to the final prosthetic phase executed under a complete digital workflow. The initial diagnosis revealed a **Class III dental and skeletal malocclusion**, characterized by mandibular advancement and mandibular bone excess. The main goals of the treatment were the correction of the skeletal relationship, restoration of functional and occlusal balance, and achievement of a harmonious facial profile integrating function, aesthetics, and long-term stability.

The main challenges were both **surgical**, involving tridimensional repositioning of the bony bases, and **orthodontic-prosthetic**, aiming to re-establish stable guidance and occlusal harmony. The treatment extended over approximately **six years**, including phases of stabilization, adaptation, and reevaluation — with a one-year interruption caused by the pandemic period. The outcome, carefully monitored and documented through time, confirms both functional stability and aesthetic harmony, with the patient's satisfaction validated by follow-ups at 18 months and 3 years postoperatively.

Patient data & context

The patient, a 40-year-old woman, presented with **functional (masticatory) discomfort** and **aesthetic concerns** related to mandibular prognathism and facial imbalance. General health was good, periodontal tissues were stable, and no active pathologies were present. Previous endodontic treatments were noted, with no temporomandibular disorders detected.

Initial situation extra- and intraoral.

Initial diagnosis

Clinical and radiological assessment (lateral cephalometry and CBCT) confirmed a **Class III dental and skeletal malocclusion** with mandibular prognathism and skeletal discrepancy between the maxilla and mandible. The occlusion was unstable, and there was an evident imbalance between the functional and facial aesthetic components.

Objectives and interdisciplinary plan

The treatment plan was designed to:

- correct the skeletal maxillo-mandibular relationship through orthognathic surgery;
- re-establish a balanced, stable occlusion;
- harmonize the facial profile and restore natural smile aesthetics;
- complete prosthetic rehabilitation under a fully digital workflow with long-term predictability.

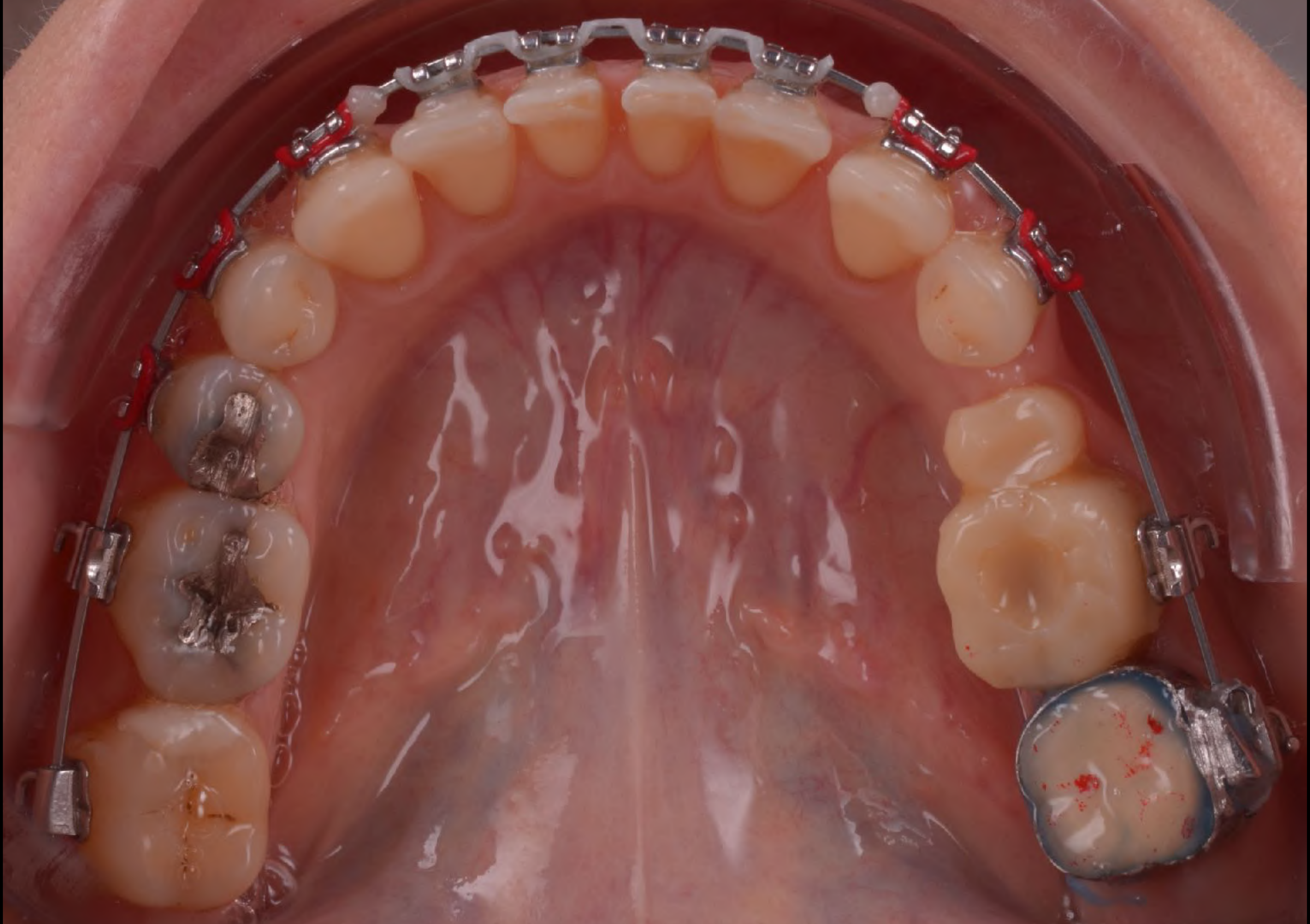
The approach involved close collaboration between **orthodontics, oral and maxillofacial surgery, and prosthodontics**, ensuring continuity and precision across all clinical stages.

Clinical methodology

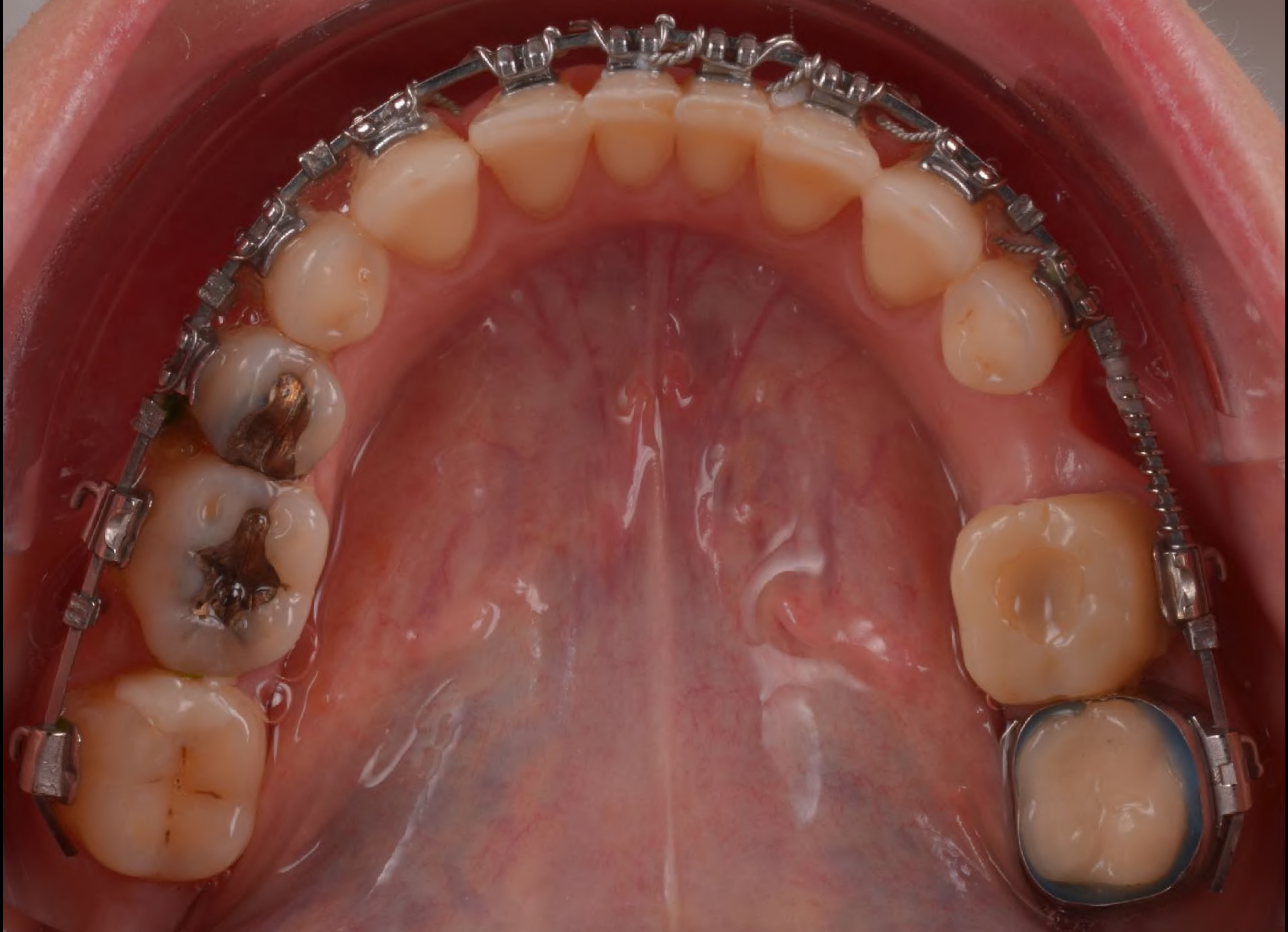
Orthodontic phase

The orthodontic treatment was initiated with a **bimaxillary fixed appliance**, aimed at dental decompensation and preparing both arches for surgical repositioning. Controlled movements were performed to achieve the optimal pre-surgical tooth position, allowing proper skeletal correction during surgery.

Pre-surgical dental alignment and arch preparation



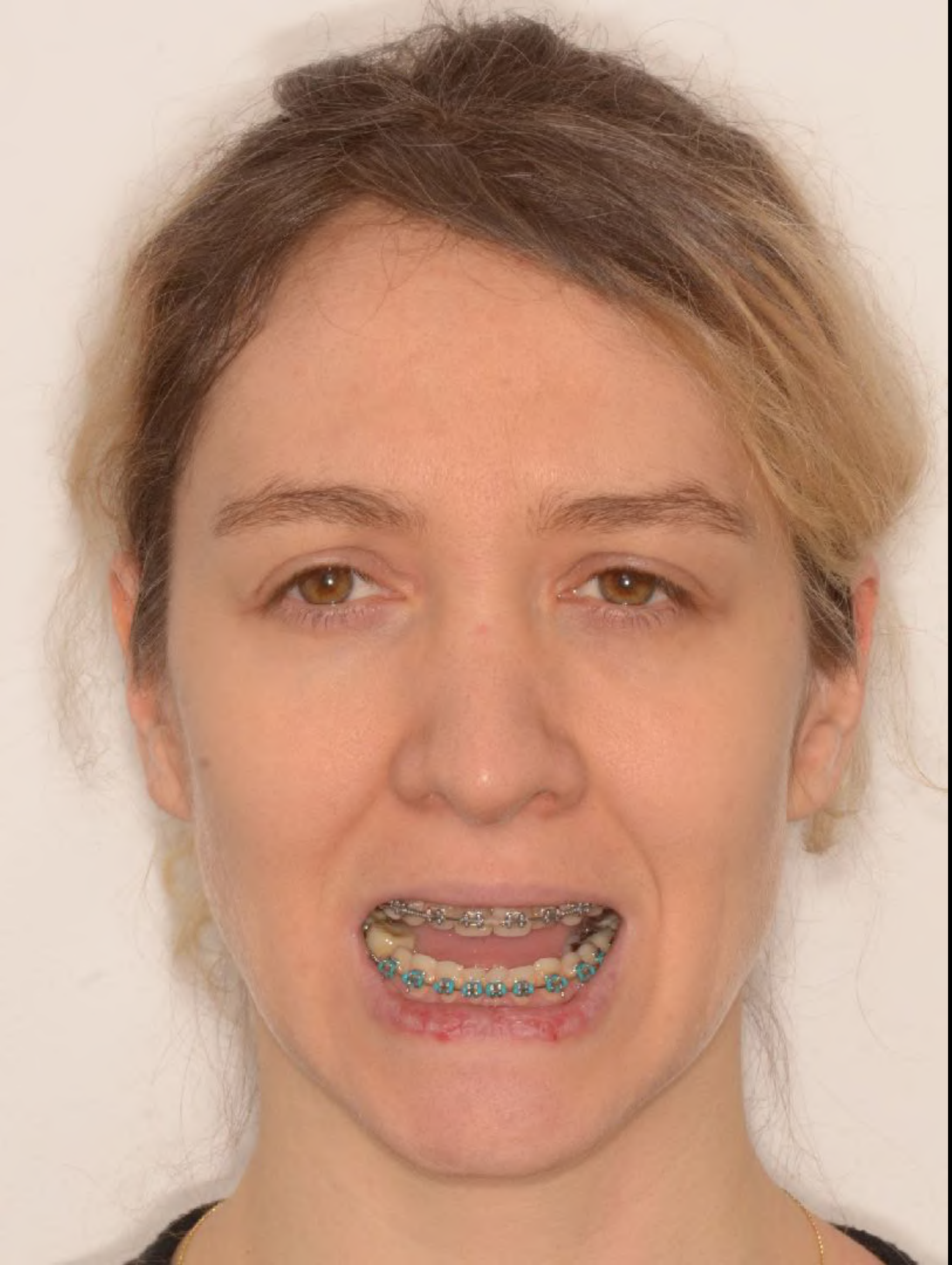
Orthodontic Treatment

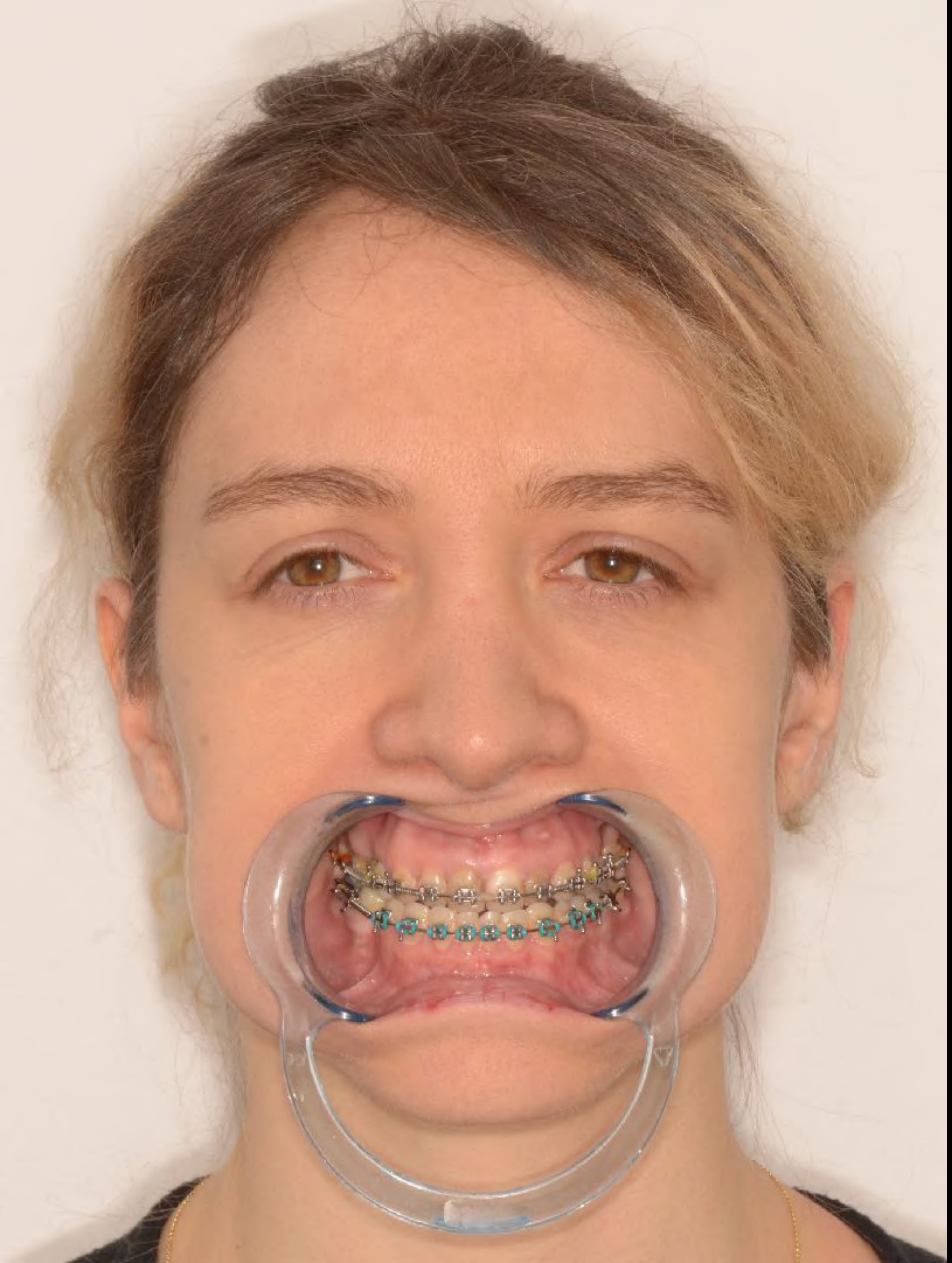
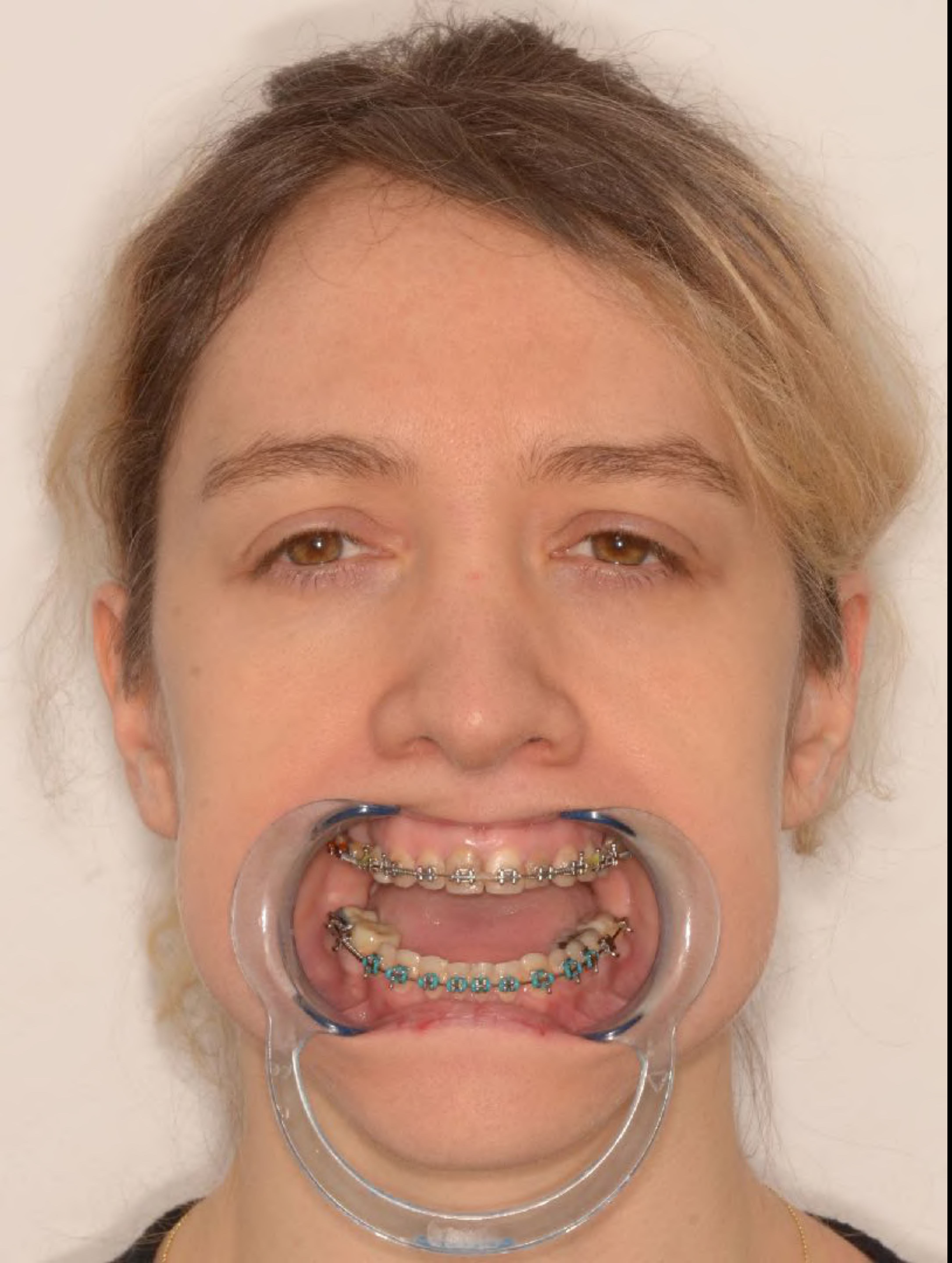


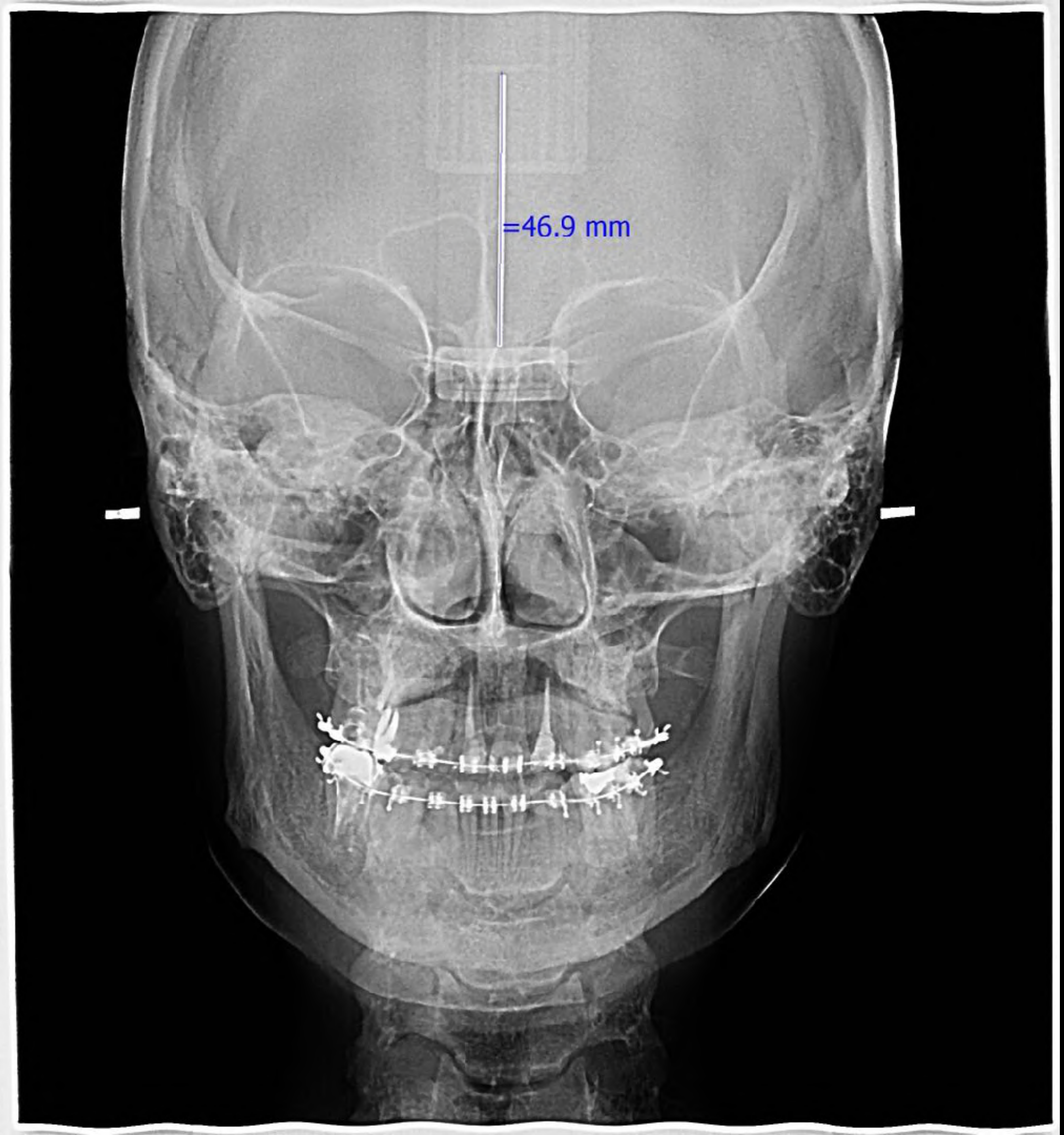
Surgical phase

After the orthodontic preparation, a **bimaxillary orthognathic surgery** was performed, involving Le Fort I and bilateral sagittal split osteotomies with controlled tridimensional repositioning. The objective was to correct mandibular prognathism and achieve a harmonious facial profile through skeletal realignment and restoration of the vertical dimension. Postoperative recovery was favorable, ensuring good occlusal stability and preservation of the newly established facial symmetry.

Surgical stages and repositioning of the bony bases

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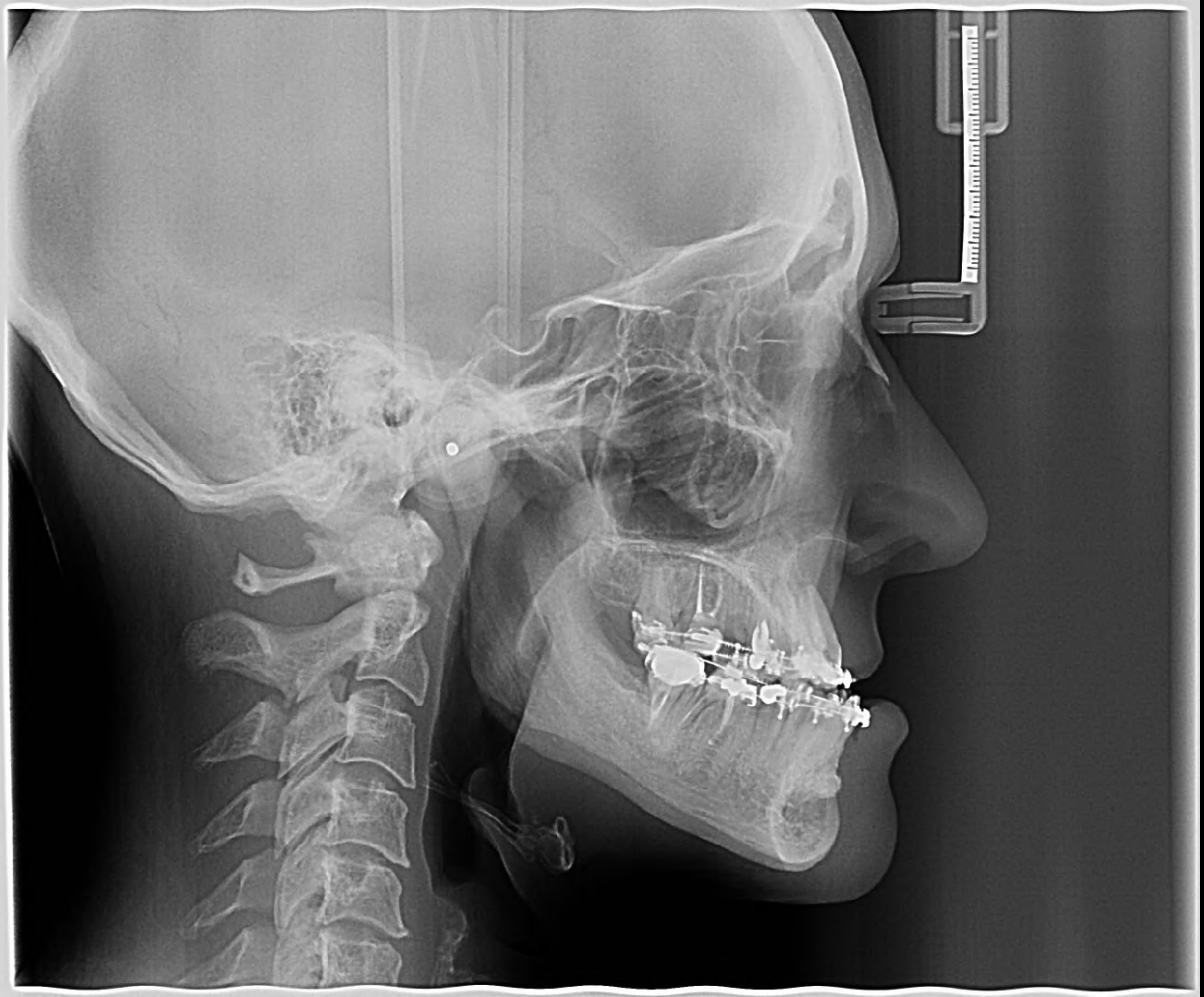
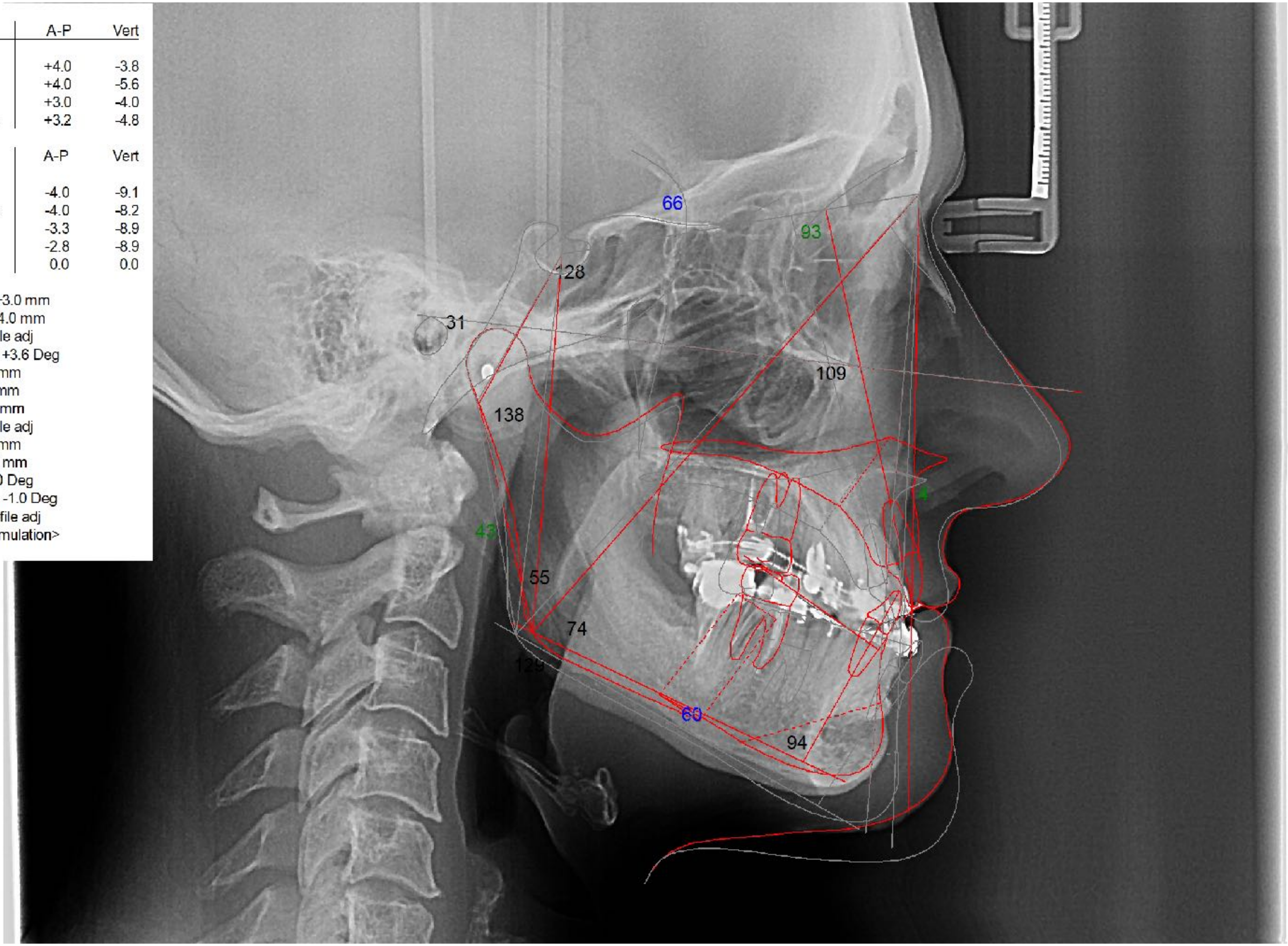
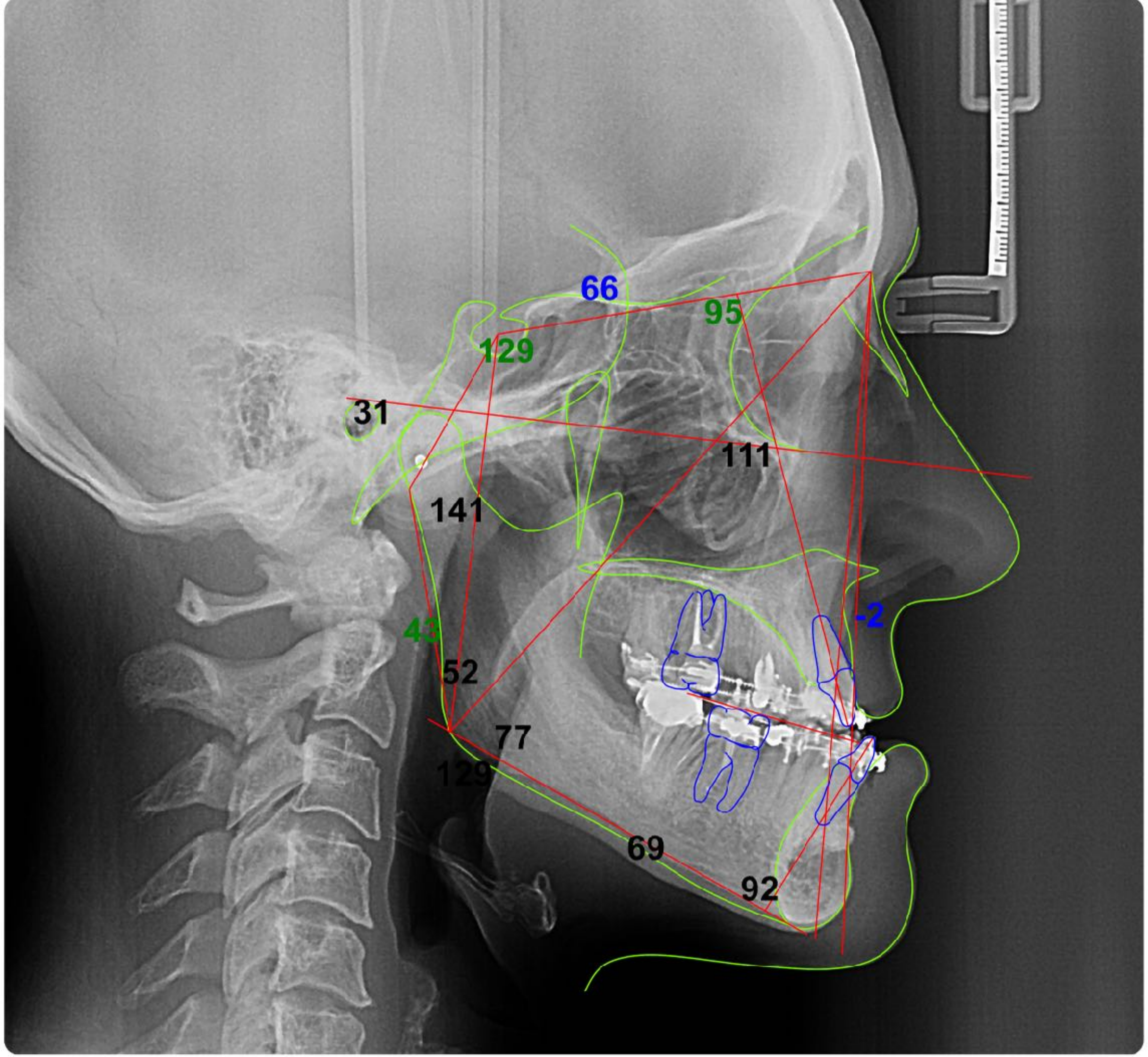




Maxilla	A-P	Vert
ANS	+4.0	-3.8
PNS	+4.0	-5.6
Mx1 tip	+3.0	-4.0
Molar MB cusp tip	+3.2	-4.8

Mandible	A-P	Vert
Md1 tip	-4.0	-9.1
Molar MB cusp tip	-4.0	-8.2
B point	-3.3	-8.9
Pog	-2.8	-8.9
Genioplasty	0.0	0.0

1. LeFort Ost: H: +3.0 mm
2. LeFort Ost: V: -4.0 mm
3. Soft-tissue profile adj
4. Auto-rotate Md: +3.6 Deg
5. BSSO: H: -8.0 mm
6. BSSO: V: -3.0 mm
7. BSSO: H: +2.0 mm
8. Soft-tissue profile adj
9. BSSO: H: -1.0 mm
10. BSSO: V: -1.0 mm
11. Mx Rotate: -2.0 Deg
12. BSSO Rotate: -1.0 Deg
13. Soft-tissue profile adj
14. <Treatment Simulation>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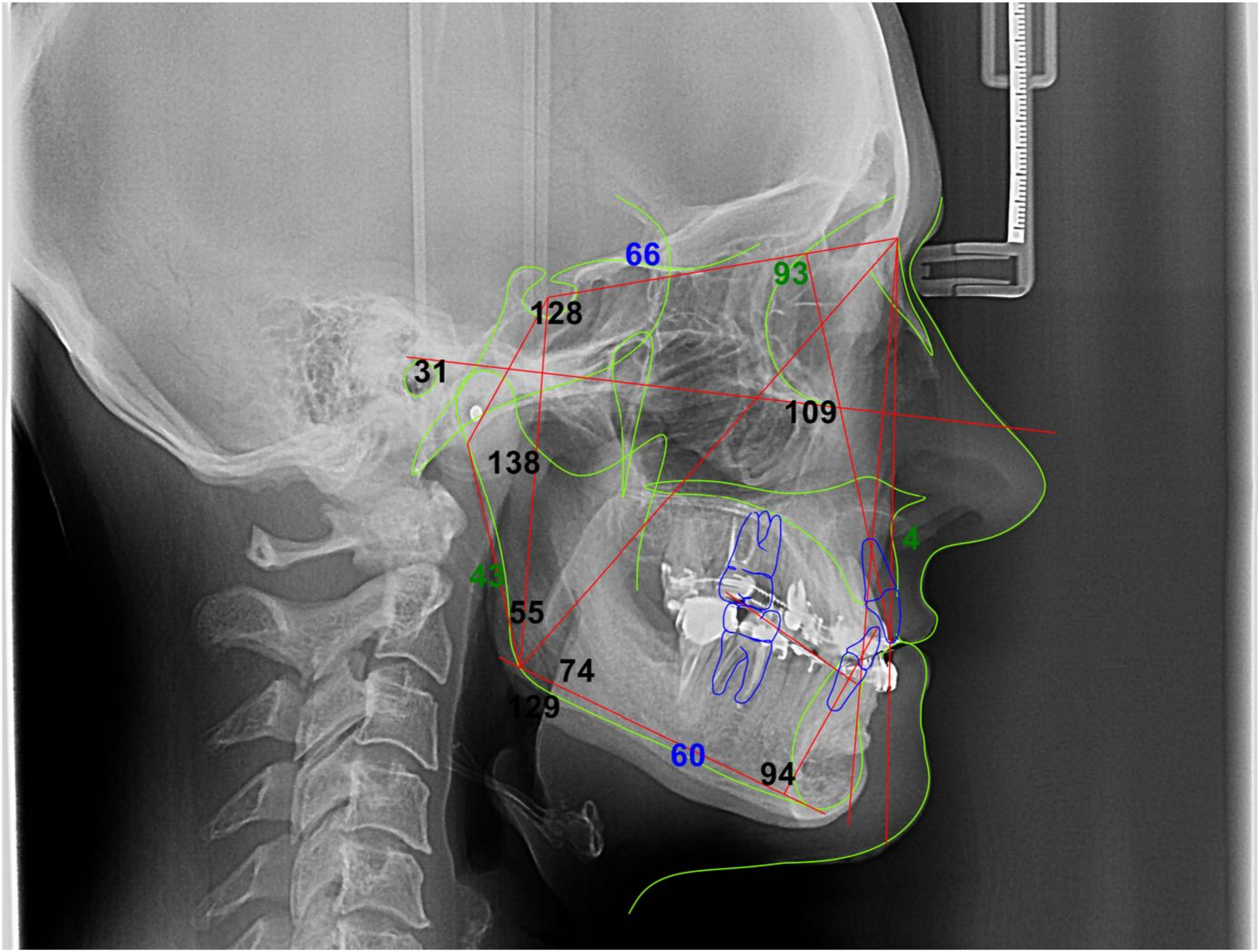
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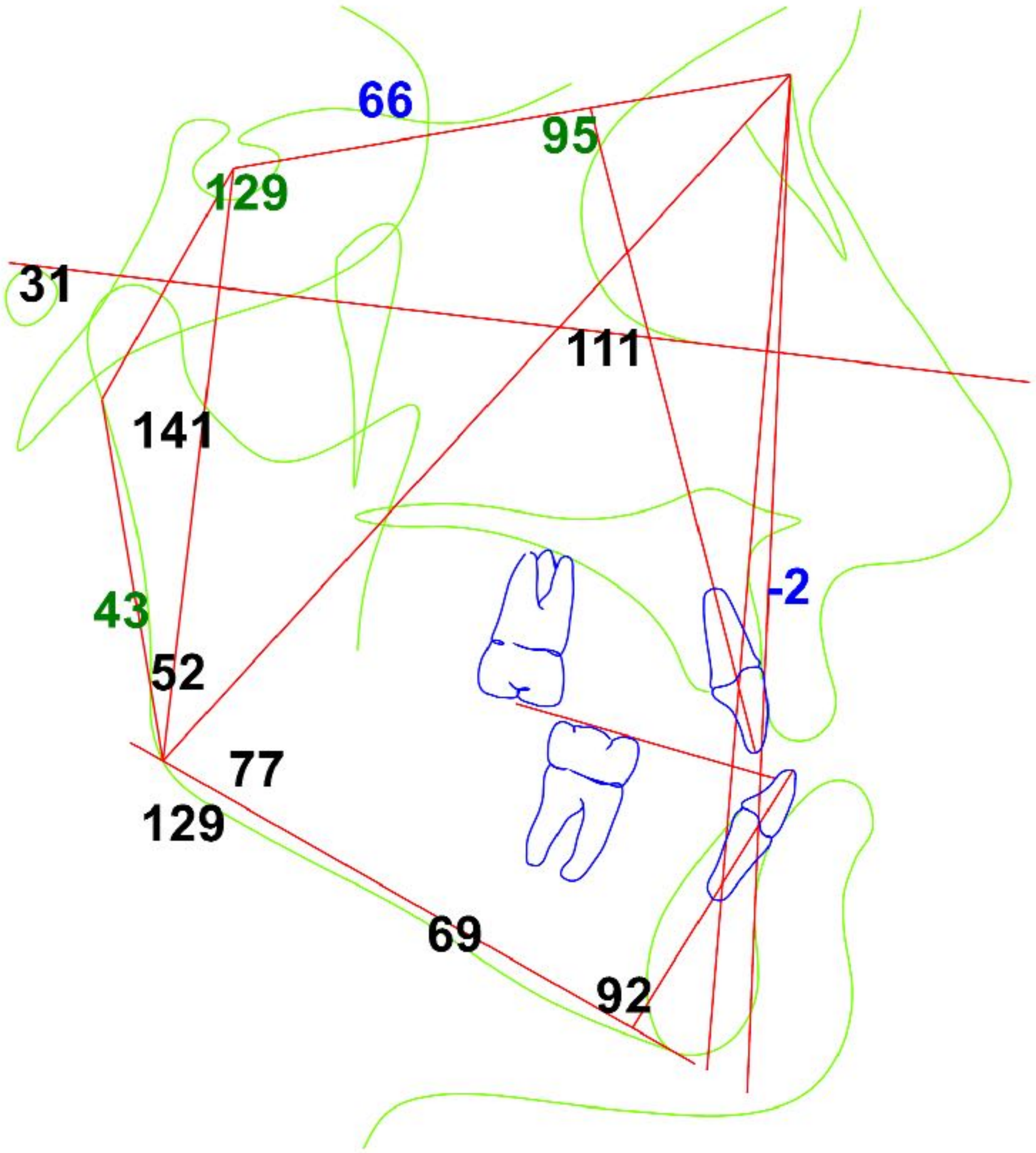
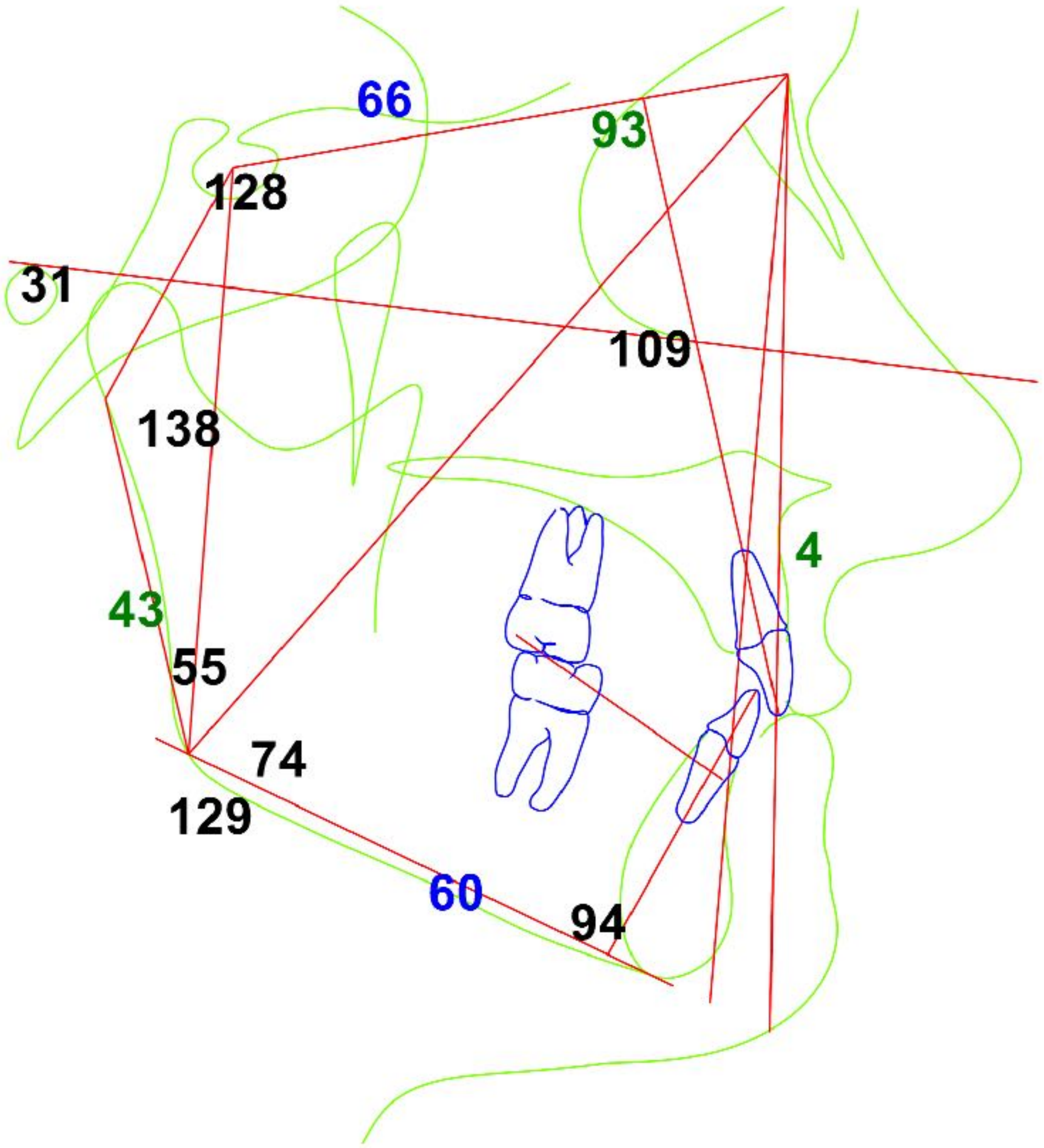
Patient: Lia Roxana Teletin, ID: J1075, Female, Age: 39y 1m (DOB: 10-Oct-80)
11-Nov-19 Pre-Op   Analysis: Roth-Jarabak   Norm: N/A

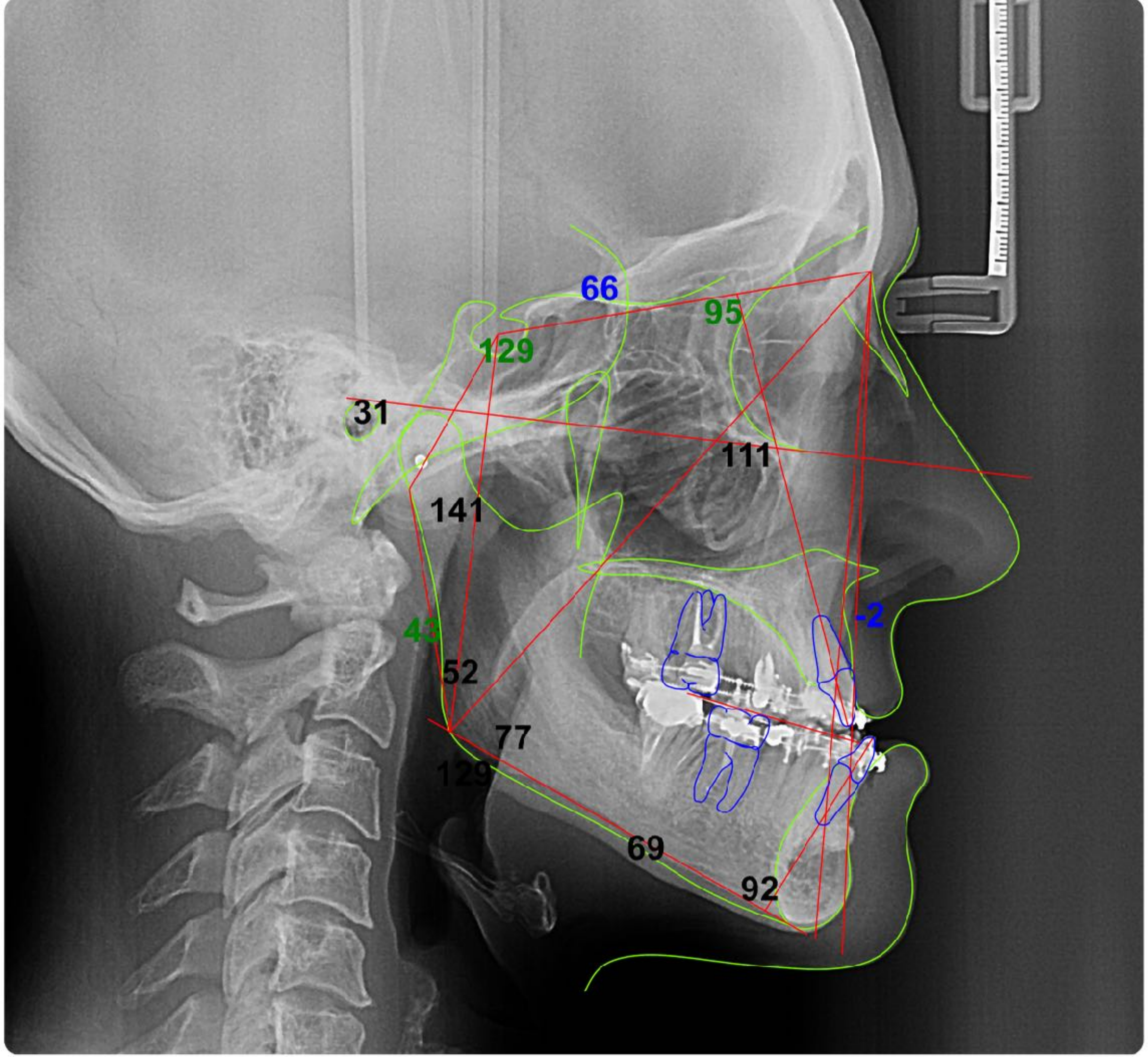
	Value	Norm	Std Dev	Dev Nor	
Skeletal					
Saddle/Sella Angle (SN-Ar) (º)	129.2	124.0	5.0	1.0	*
Articular Angle (º)	140.8	140.3	6.0	0.1	
Gonial/Jaw Angle (Ar-Go-Me) (º)	129.2	122.9	6.7	0.9	
Upper Gonial Angle (Ar-Go-Na) (º)	52.0	52.0	7.0	0.0	
Lower Gonial Angle (Na-Go-Me) (º)	77.2	71.2	6.0	1.0	*
Sum of Angles (Jarabak) (º)	399.2	386.6	6.0	2.1	**
Anterior Cranial Base (SN) (mm)	66.5	75.3	3.0	-2.9	**
Posterior Cranial Base (S-Ar) (mm)	31.3	35.0	4.0	-0.9	
Ramus Height (Ar-Go) (mm)	43.1	48.5	4.5	-1.2	*
Corpus Length (Go-Me) (mm)	69.1	71.0	5.0	-0.4	
P-A Face Height (S-Go/N-Me) (%)	60.6	65.0	4.0	-1.1	*
Jarabak Anterior Ratio (x100)	83.1	93.0	4.0	-2.5	**
SNA (º)	75.6	82.0	3.5	-1.8	*
SNB (º)	78.0	80.9	3.4	-0.9	
ANB (º)	-2.4	1.6	1.5	-2.7	**
Anterior Face Height (NaMe) (mm)	115.8	128.5	5.0	-2.5	**
Posterior Face Height (SGo) (mm)	70.2	82.5	5.0	-2.5	**
Dental					
IMPA (L1-MP) (º)	92.3	95.0	7.0	-0.4	
U1 - SN (º)	94.8	102.8	5.5	-1.5	*
U1 - FH (º)	111.0	109.8	5.3	0.2	



Patient: Lia Roxana Teletin, ID: J1075, Female, Age: 39y 1m (DOB: 10-Oct-80)
11-Nov-19 Pre-Op   Analysis: Roth-Jarabak   Norm: N/A

	Value	Norm	Std Dev	Dev Nor	
Skeletal					
Saddle/Sella Angle (SN-Ar) (º)	128.5	124.0	5.0	0.9	
Articular Angle (º)	137.9	140.3	6.0	-0.4	
Gonial/Jaw Angle (Ar-Go-Me) (º)	128.8	122.9	6.7	0.9	
Upper Gonial Angle (Ar-Go-Na) (º)	54.6	52.0	7.0	0.4	
Lower Gonial Angle (Na-Go-Me) (º)	74.2	71.2	6.0	0.5	
Sum of Angles (Jarabak) (º)	395.2	386.6	6.0	1.4	*
Anterior Cranial Base (SN) (mm)	66.5	75.3	3.0	-2.9	**
Posterior Cranial Base (S-Ar) (mm)	31.2	35.0	4.0	-0.9	
Ramus Height (Ar-Go) (mm)	43.1	48.5	4.5	-1.2	*
Corpus Length (Go-Me) (mm)	60.4	71.0	5.0	-2.1	**
P-A Face Height (S-Go/N-Me) (%)	64.5	65.0	4.0	-0.1	
Jarabak Anterior Ratio (x100)	94.8	93.0	4.0	0.4	
SNA (º)	79.3	82.0	3.5	-0.8	
SNB (º)	75.6	80.9	3.4	-1.6	*
ANB (º)	3.7	1.6	1.5	1.4	*
Anterior Face Height (NaMe) (mm)	107.7	128.5	5.0	-4.2	****
Posterior Face Height (SGo) (mm)	69.5	82.5	5.0	-2.6	**
Dental					
IMPA (L1-MP) (º)	93.8	95.0	7.0	-0.2	
U1 - SN (º)	92.8	102.8	5.5	-1.8	*
U1 - FH (º)	109.0	109.8	5.3	-0.1	

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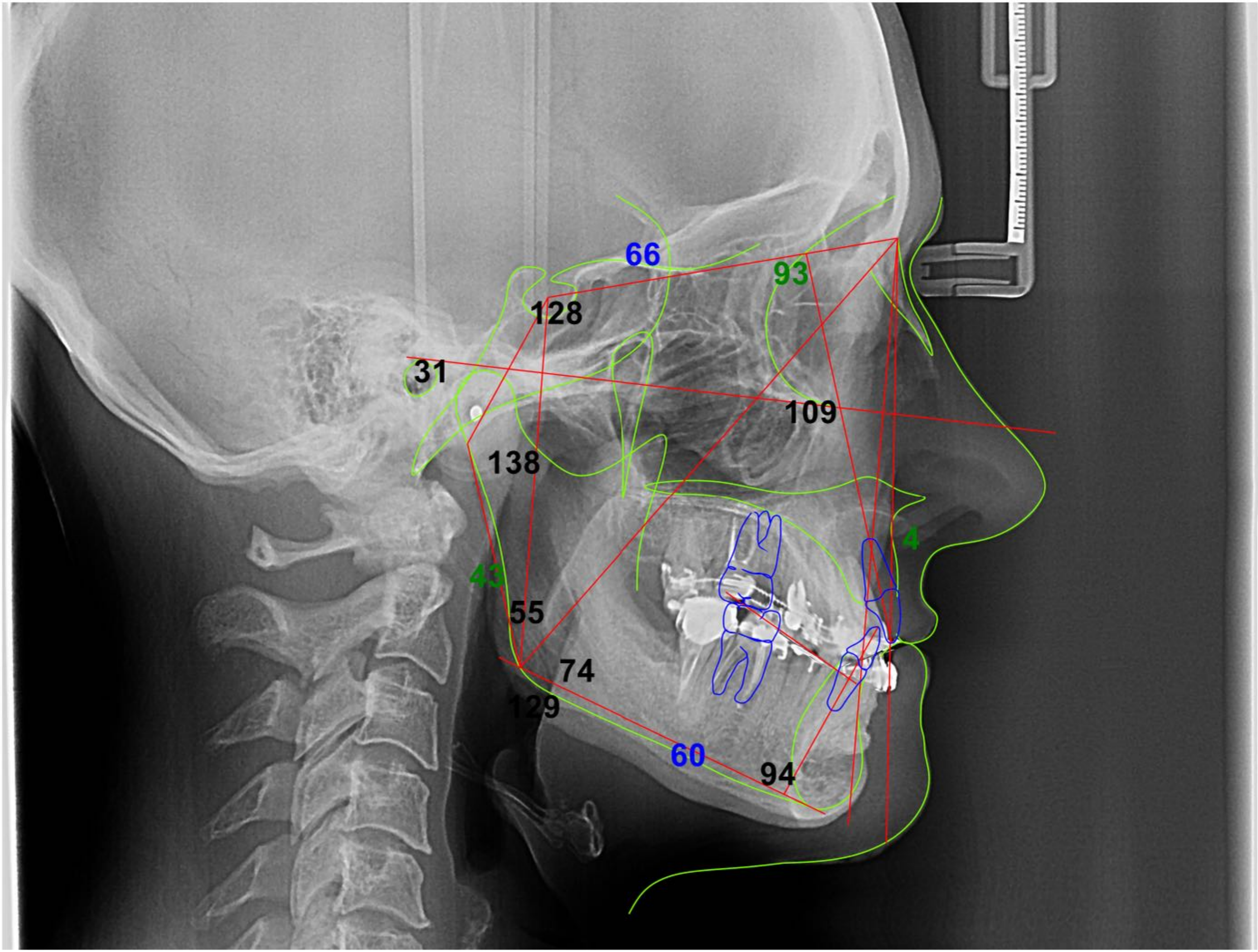
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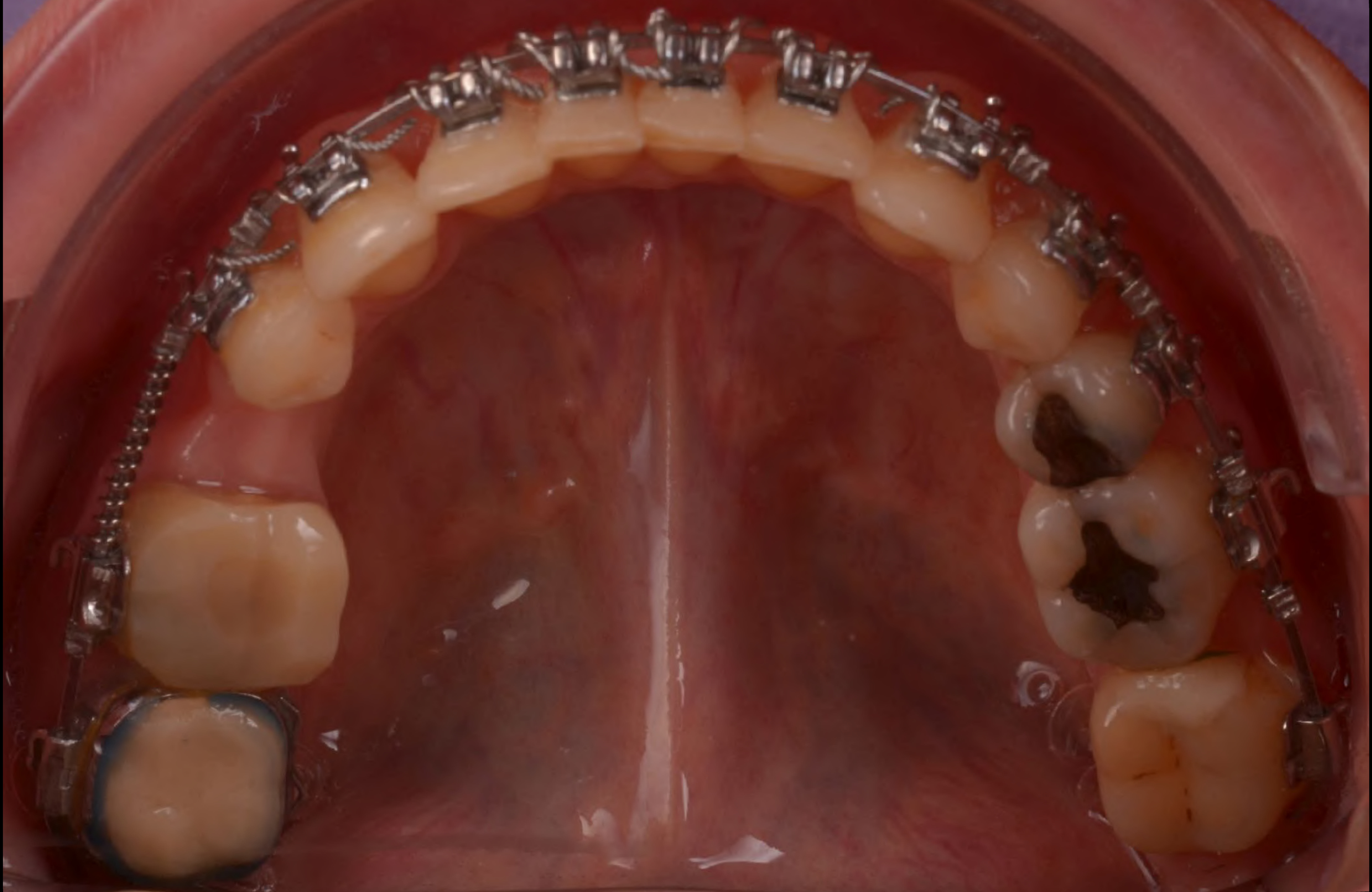
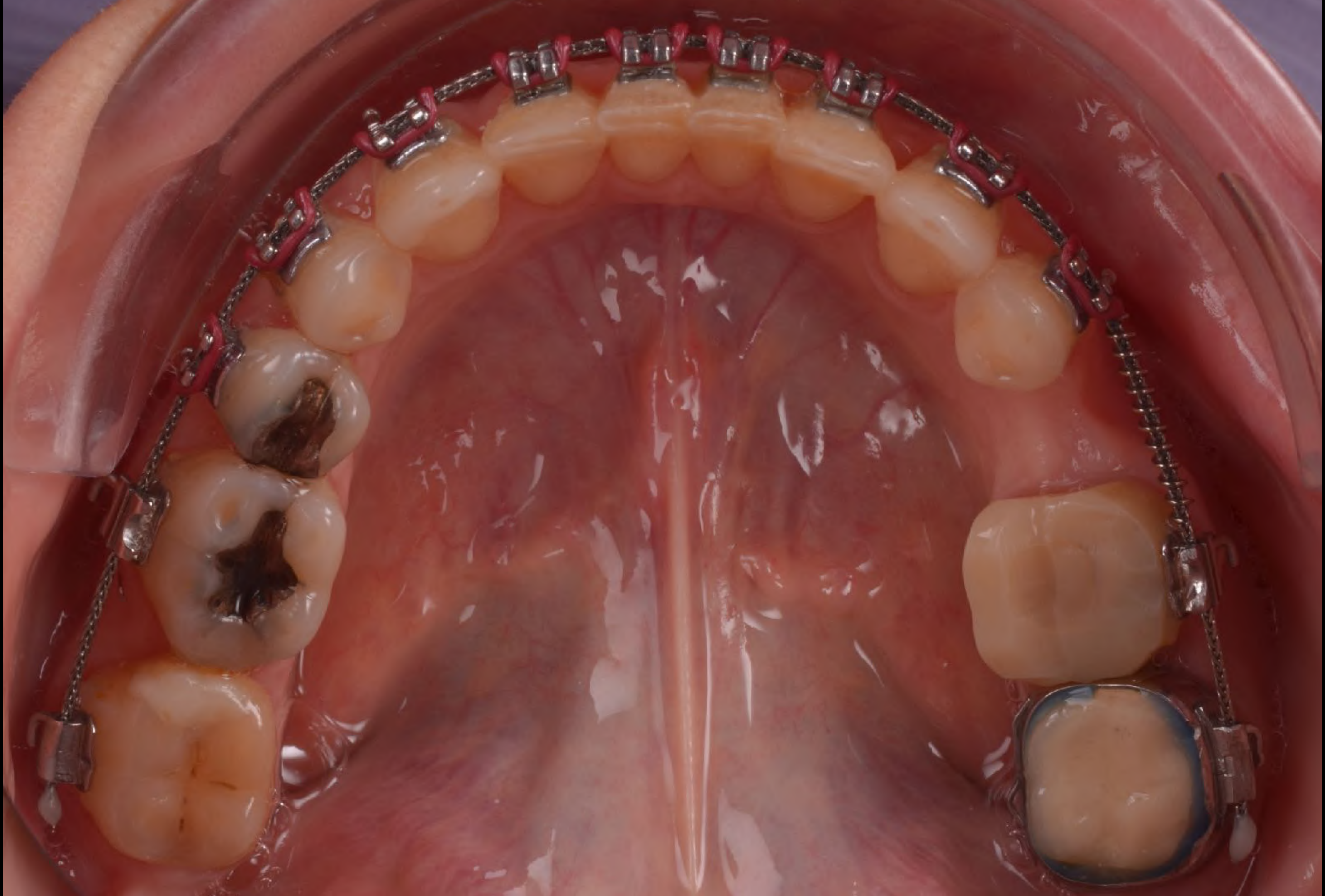
Post-surgical orthodontic phase

A second orthodontic stage followed to fine-tune occlusal contacts and functional guidance. This phase ensured the stabilization of the postoperative result and provided an optimal foundation for prosthetic rehabilitation.

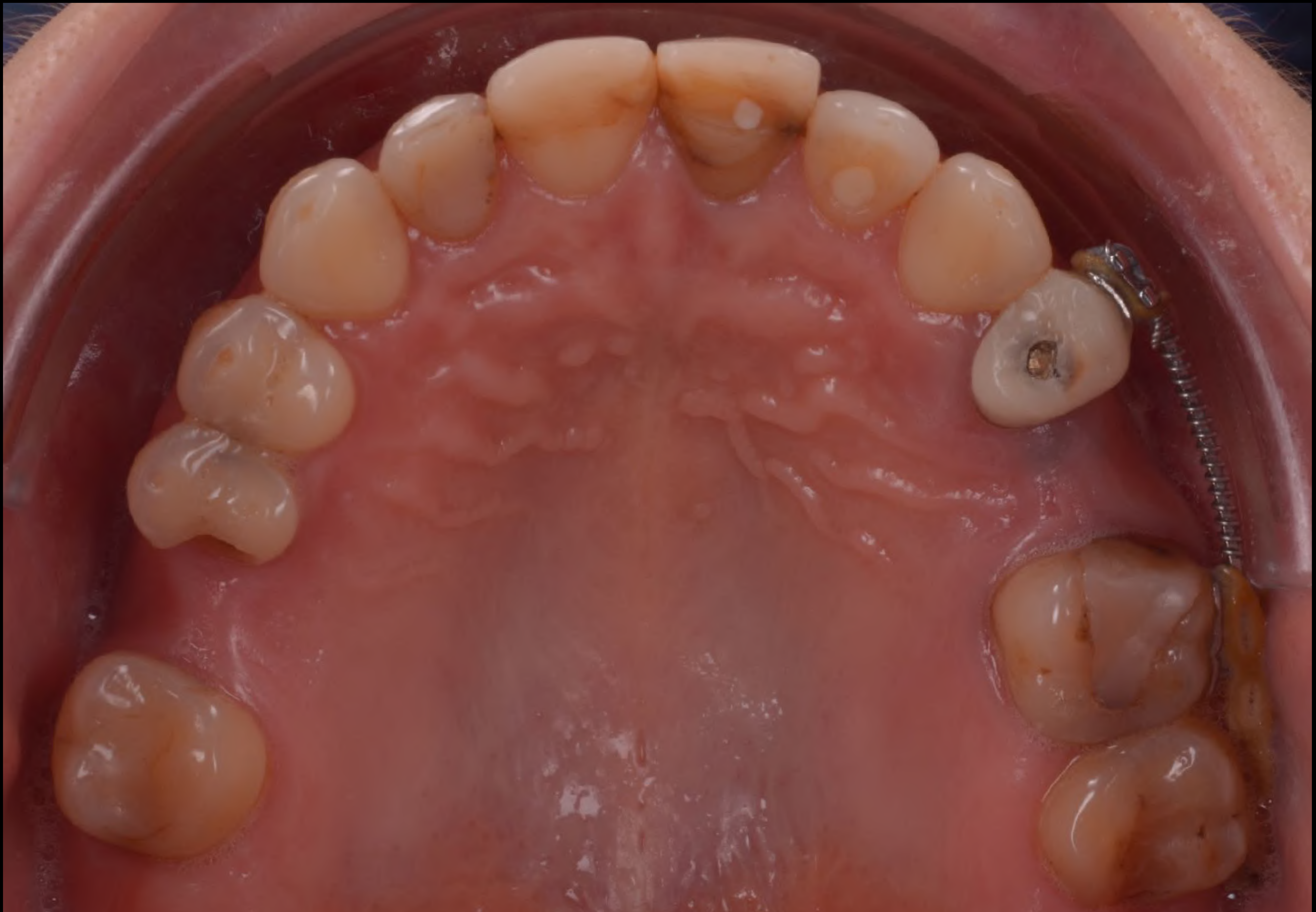
Occlusal adjustment and post-surgical stabilization



Orthodontic Treatment

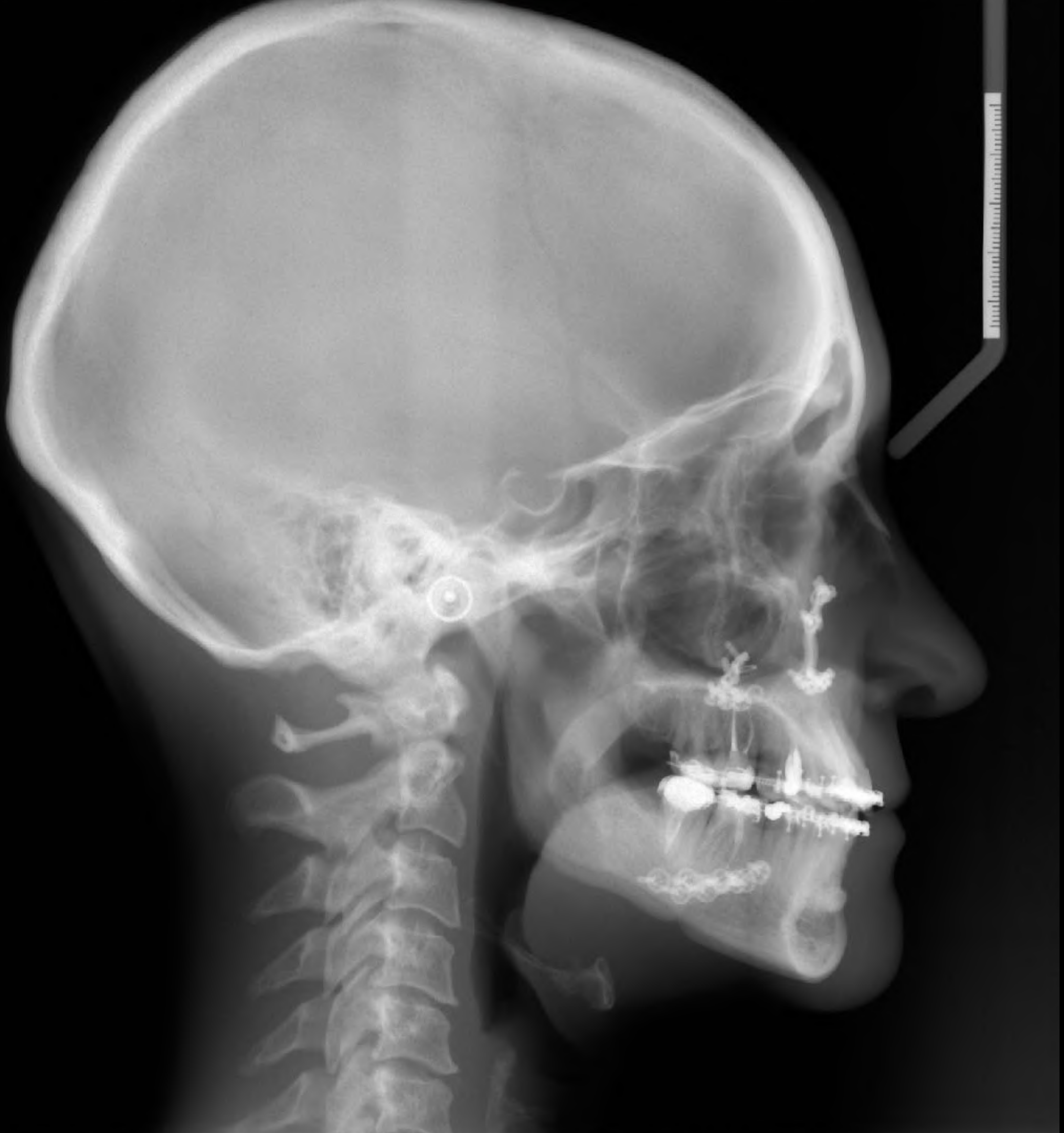


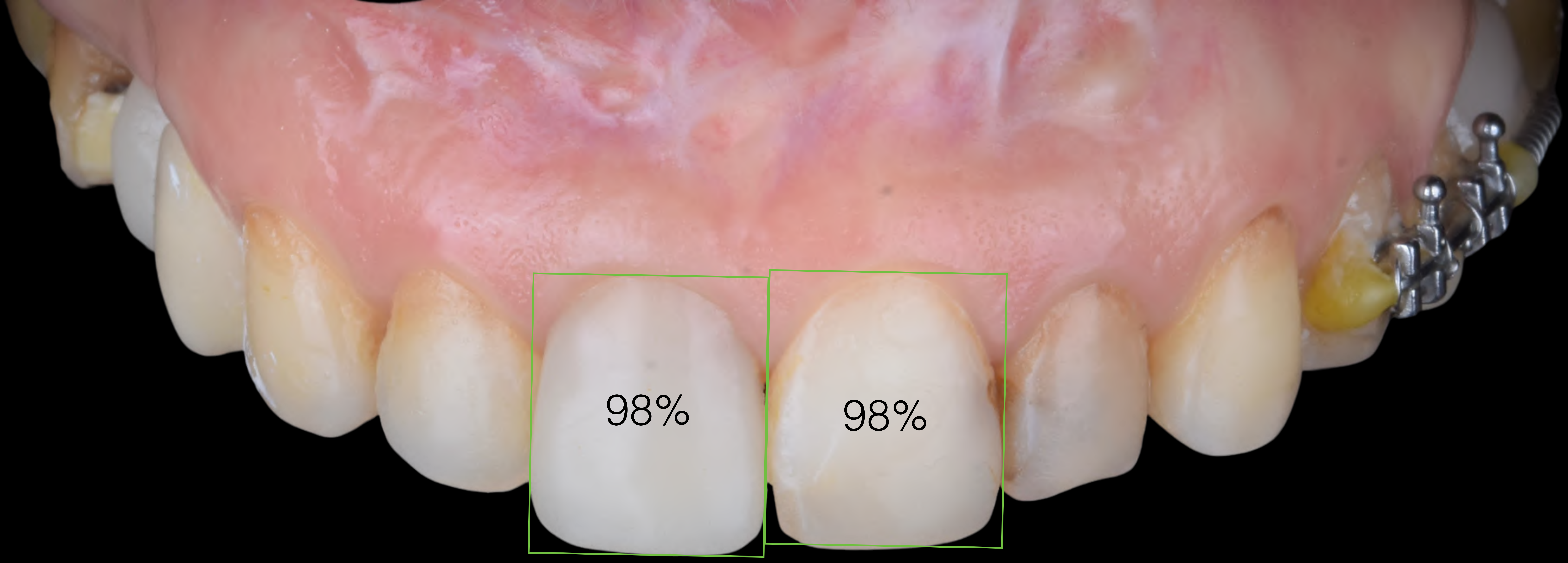




Prosthetic-digital phase

After the orthodontic treatment was completed, a new **digital diagnostic workflow** was performed, including intraoral scanning, standardized photographic documentation, and functional evaluation. Based on this dataset, a **Digital Smile Design** was created using **SmileCloud**, followed by a **digital wax-up** in **Exocad**.

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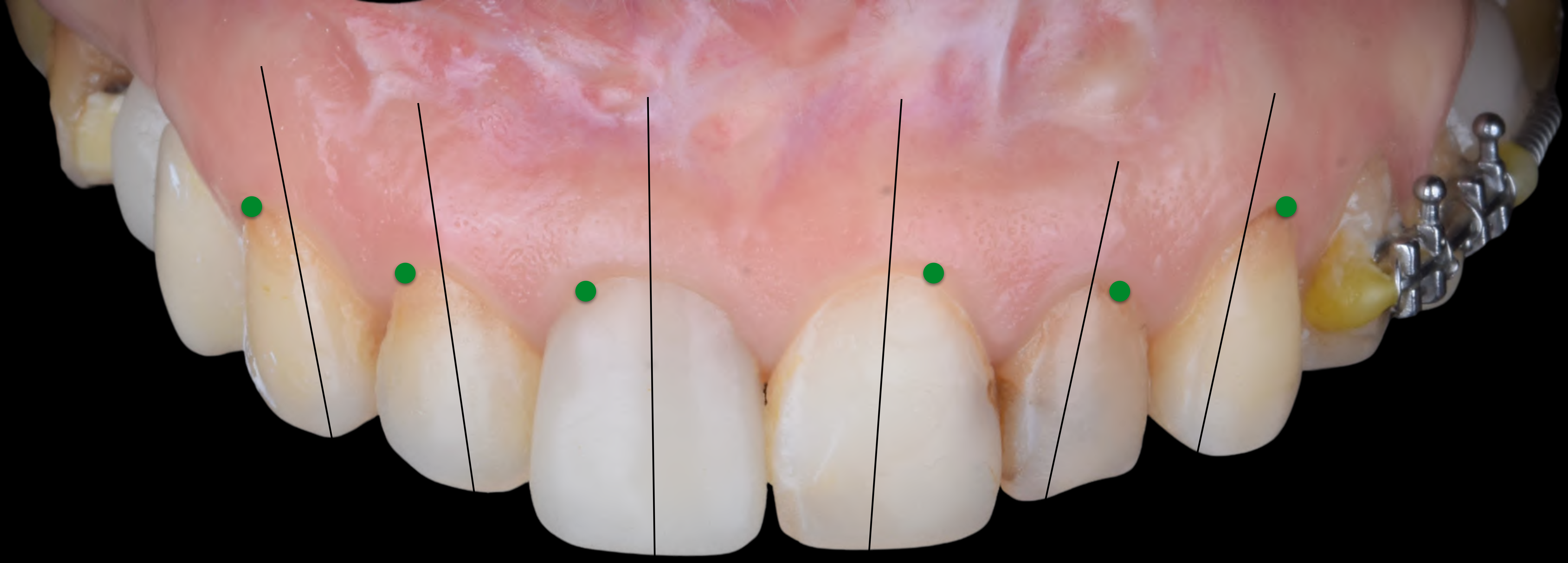
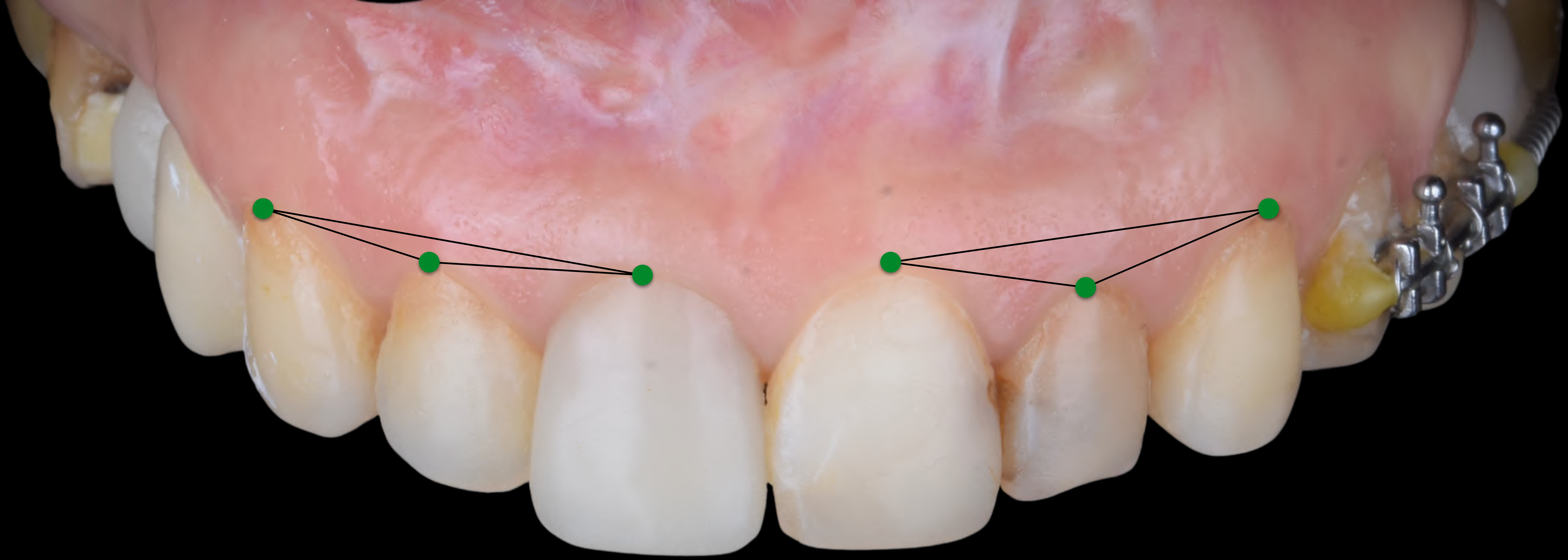
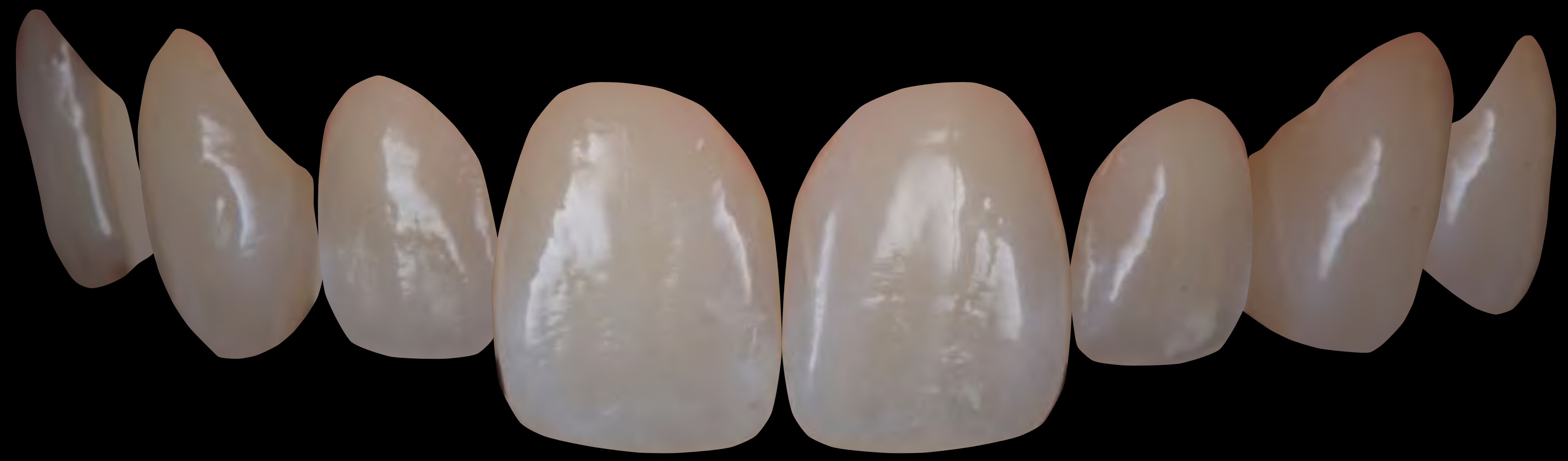
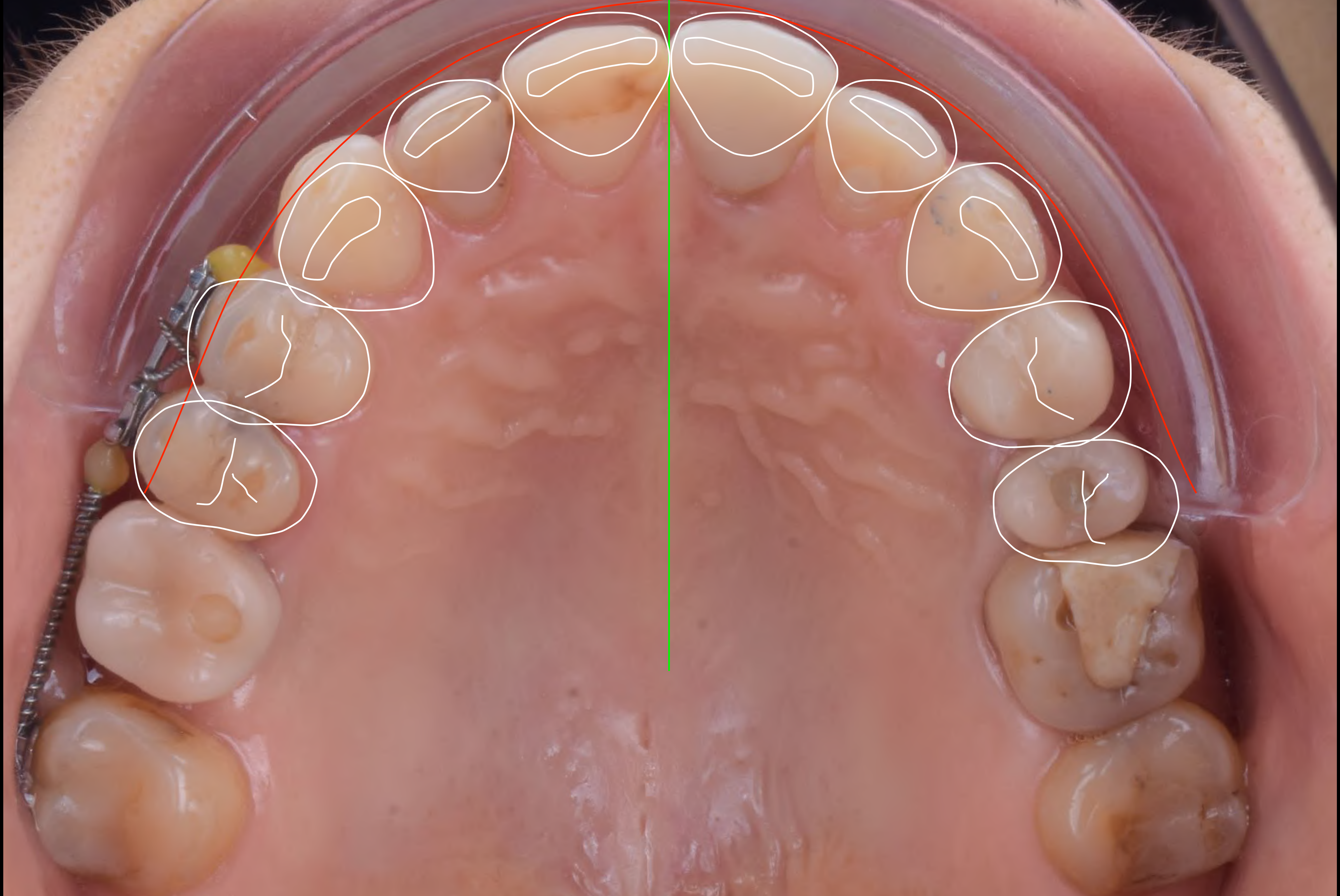
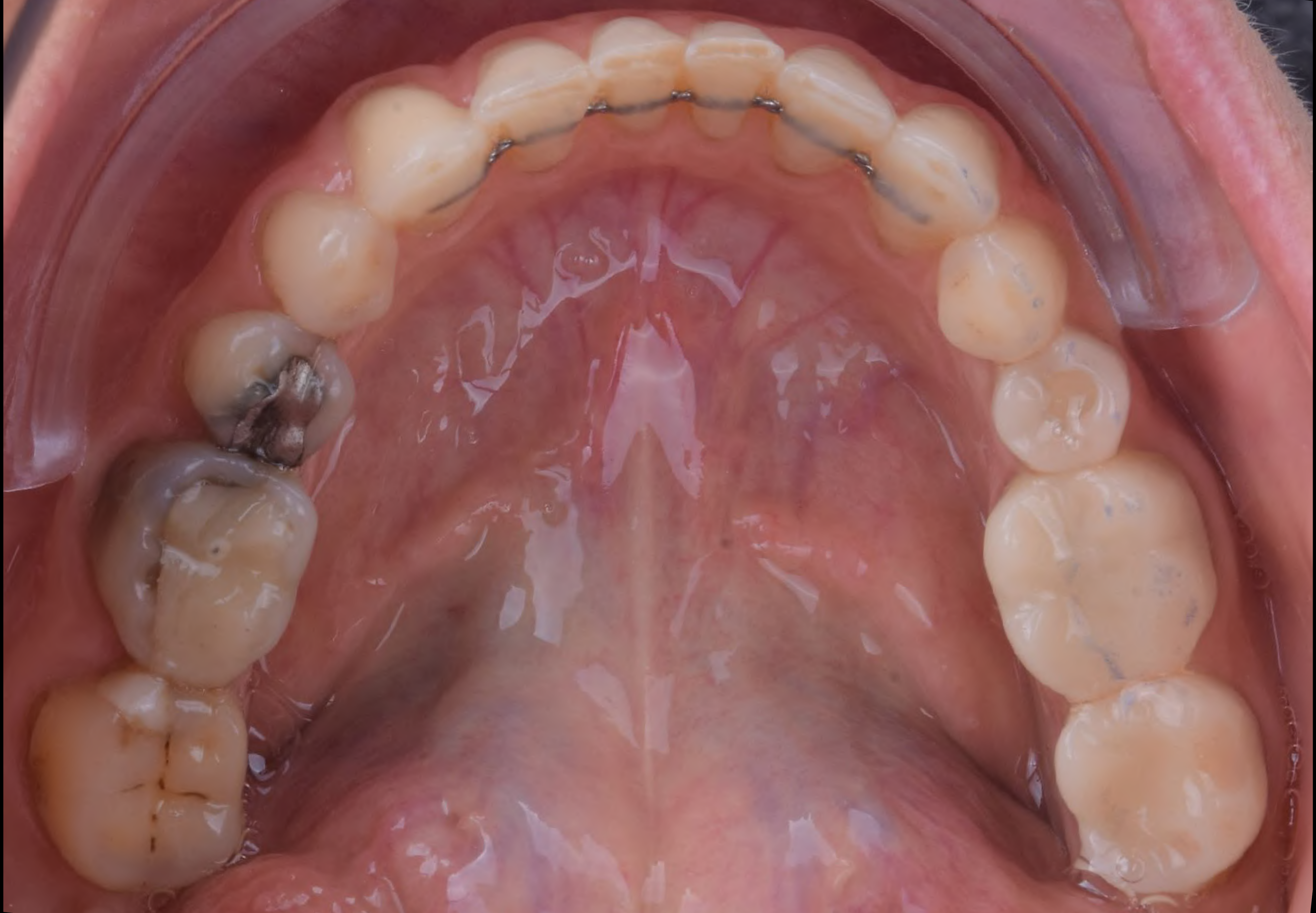






DSD


YES
smilecloud
Automatically generated content. Use caution - results
may vary and are not intended as clinical guidance.

Prosthetic-digital phase

The design was transferred into a **clinical mock-up** fabricated from provisional material (Luxatemp) and tested for several weeks to validate both esthetics and function. Once the test-drive was approved, the definitive restorations were fabricated using **feldspathic ceramic on refractory dies**, **Emax**, and **Emax over zirconia substructure**, all cemented adhesively.

Mock-up

Guided refinement through Mock-Up + Digital Scanning


-X
+Z


-X
+Z


-X
+Z

+Z
+X

+Z
+X


+Z
+X


+Z


+Z


+Z


-Y


-Y


-Y

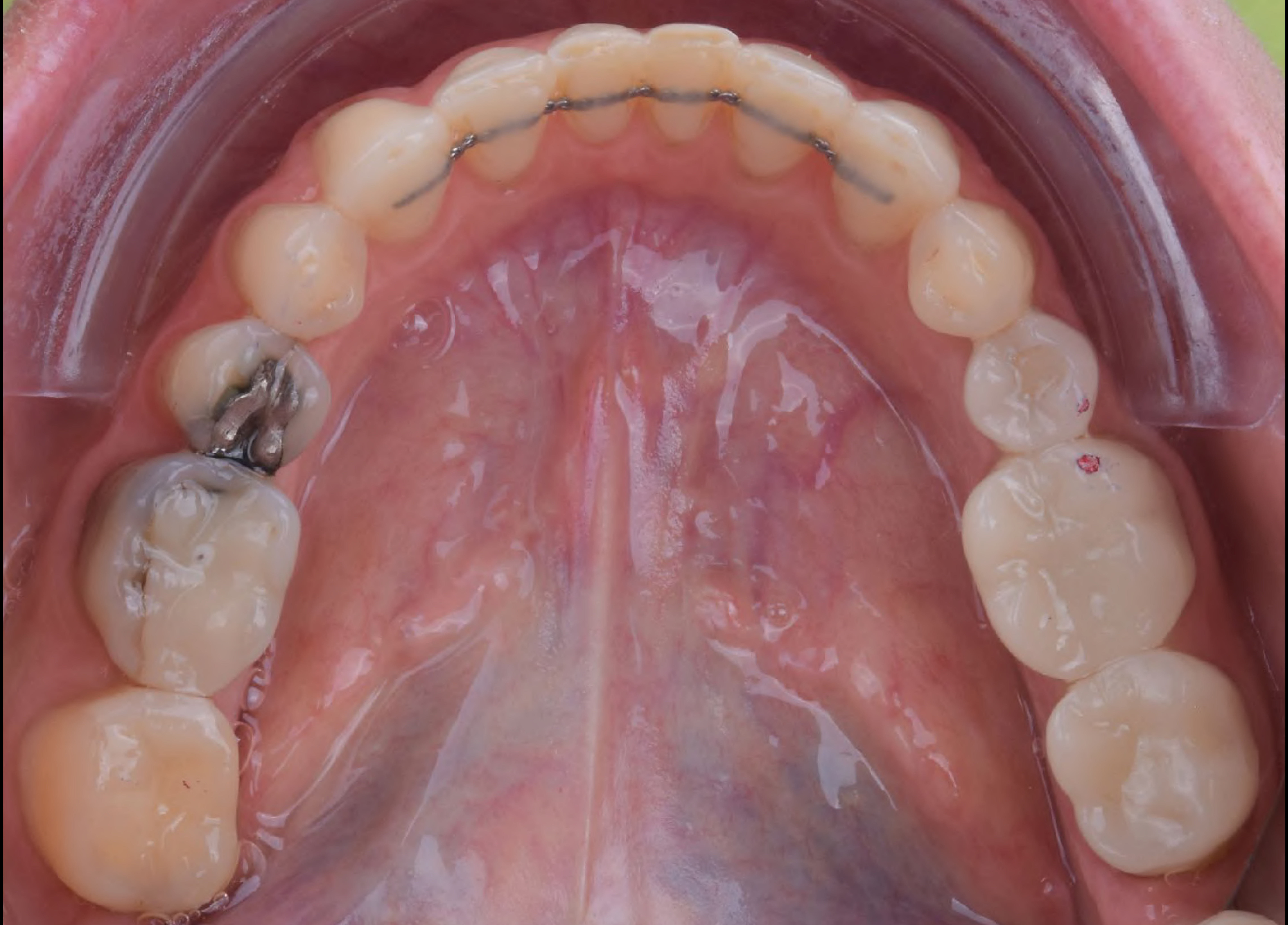
Final restorations delivered


D|D
DIGITAL DENTAL LAB


+Z


+Z


+Z




+Z


-X


+Z
+X


-Y



Modjaw Post-Op

Occlusal and functional verification

Final occlusion was verified both **clinically and digitally**, using **Modjaw 4D analysis** to assess mandibular movements and real-time occlusal dynamics. The result confirmed a **stable maximum intercuspation**, functional anterior and canine guidance, and symmetrical balance in excursive movements.

RIGHT CONDYLE - SAGITTAL
37 °
LEFT CONDYLE - SAGITTAL
45 °
INTERINCISAL - SAGITTAL
00:33:223
00:36:448
00:00:000
00:36:448
SPEED
Protrusion 13h44
MODJAW

RIGHT CONDYLE - SAGITTAL
37 °
LEFT CONDYLE - SAGITTAL
45 °
INTERINCISAL - SAGITTAL
00:27:149
00:36:448
00:00:000
00:36:448
SPEED
Protrusion 13h44
MODJAW


RIGHT CONDYLE - SAGITTAL
37 °
LEFT CONDYLE - SAGITTAL
45 °
INTERINCISAL - FRONTAL
00:21:649
00:35:749
00:00:000
00:35:749
SPEED
Right laterotrusion 13h44
MODJAW


RIGHT CONDYLE - SAGITTAL
37 °
LEFT CONDYLE - SAGITTAL
45 °
INTERINCISAL - FRONTAL
00:11:050
00:14:257
00:00:000
00:14:257
SPEED
Left laterotrusion 13h45
MODJAW


RIGHT CONDYLE -
SAGITTAL
37°
LEFT CONDYLE -
SAGITTAL
45°
INTERINCISAL -
FRONTAL
00:13:125
00:20:375
00:00:000
00:20:375
SPEED
Centric relation 13h47
MODJAW

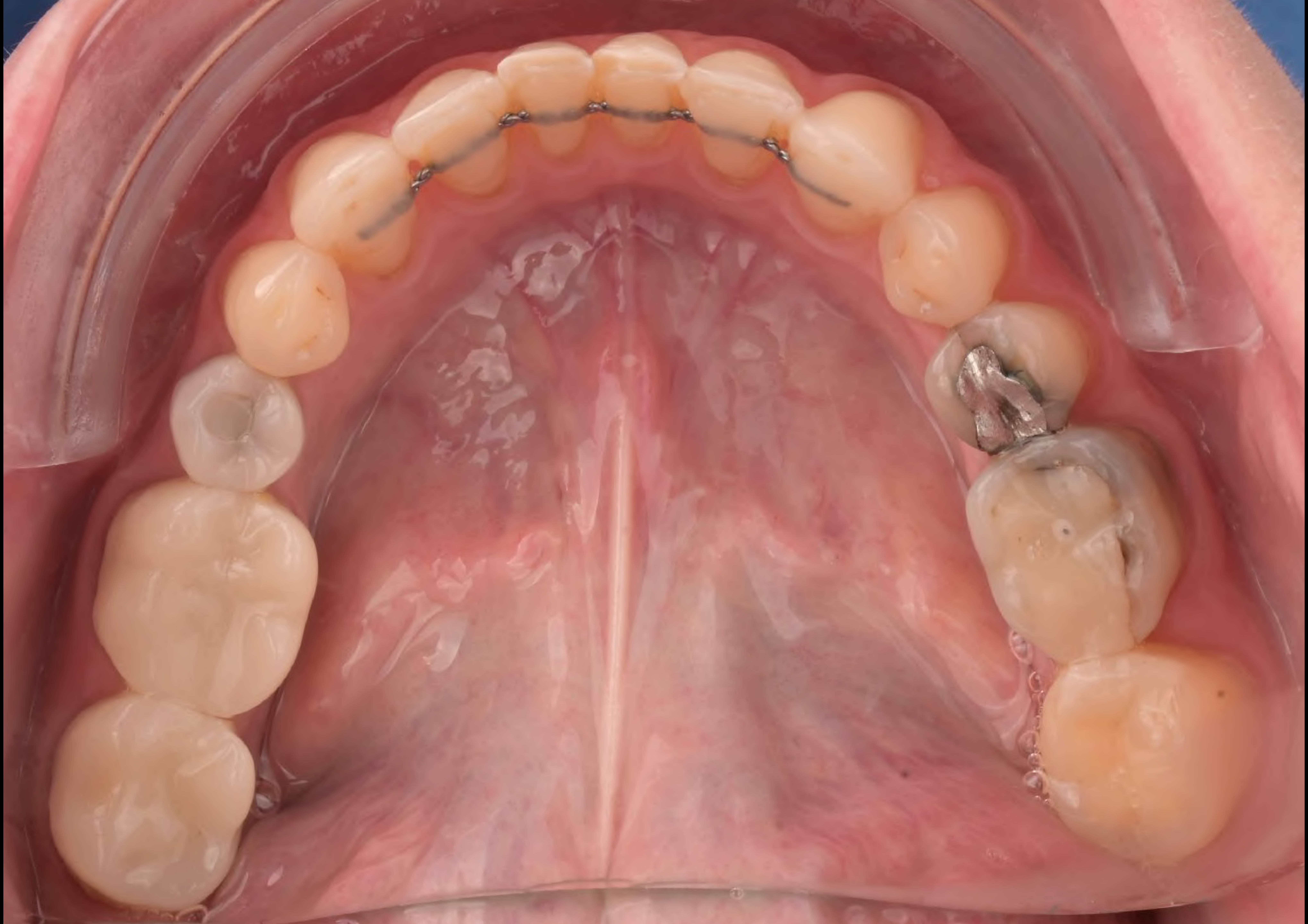

RIGHT CONDYLE - SAGITTAL
37 °
LEFT CONDYLE - SAGITTAL
45 °
INTERINCISAL - FRONTAL
00:43:281
00:48:890
00:00:000
00:48:890
SPEED
Chewing 13h46
MODJAW

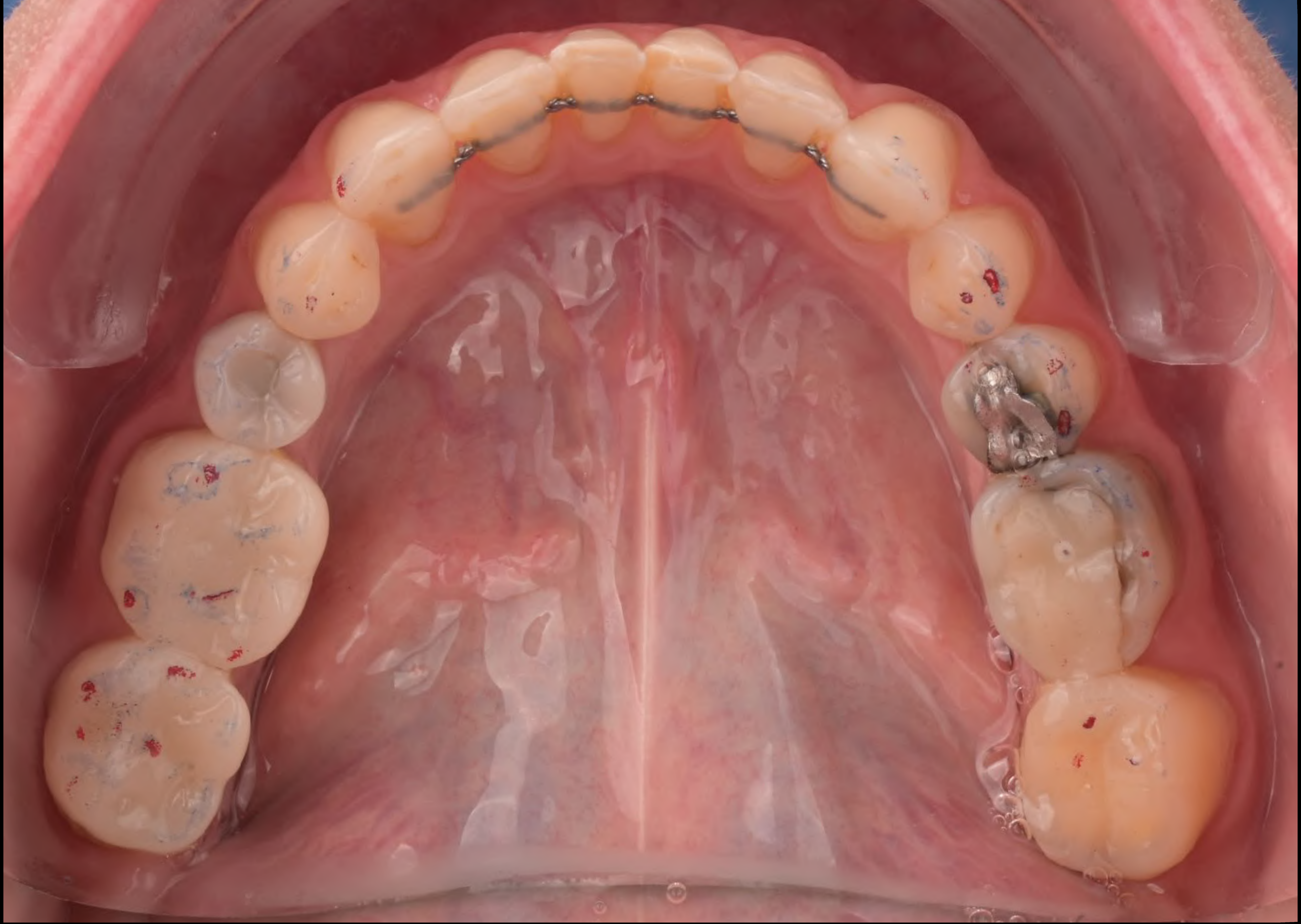
Results and follow-up

The final outcome represents a complete and harmonious rehabilitation, with the facial profile transitioning from prognathic to balanced, restoring natural proportions and smile expression. The occlusion is functionally stable, tissues are healthy, and esthetics have been naturally integrated.

The patient was monitored at **18 months and 3 years postoperatively**, showing no relapse or structural alterations. Only minor **incisal chipping** was observed and conservatively managed. Beyond the clinical achievement, the result profoundly impacted the patient’s confidence and quality of life — a transformation that reached beyond dental correction.

Follow-up 18 months





Complications and management

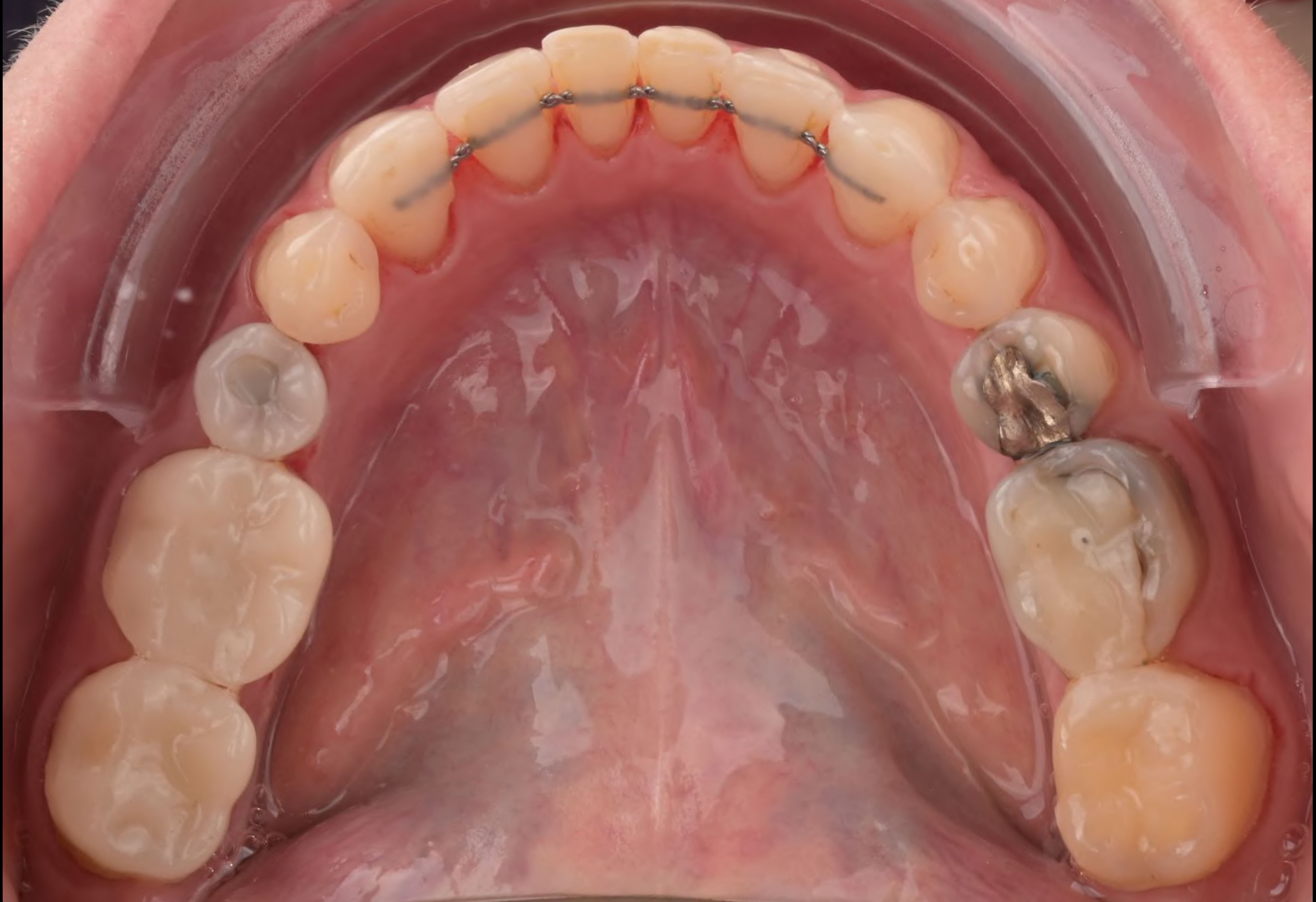
Except for minor prosthetic adjustments, evolution was favorable. The close coordination between disciplines allowed early management of potential issues and ensured the prevention of functional or aesthetic relapse.

Follow-up 3 years






2MM



Clinical conclusions and interdisciplinary value

This case exemplifies the strength of a **truly integrated interdisciplinary workflow**, where orthodontic, surgical, and prosthetic phases are seamlessly connected through precise communication and digital planning. The six-year treatment duration reflects not only technical complexity but also the patience, empathy, and responsibility shared by an entire team united by a common goal: restoring balance, function, and confidence.

Digital technologies such as **SmileCloud**, **Exocad**, and **Modjaw** facilitated cross-specialty collaboration and increased the predictability of the outcome. The achieved rehabilitation blends function, esthetics, and emotion — transforming not just a smile, but a life perspective.

Ultimately, this case stands as a lesson in **patience, collaboration, and gratitude** — for the interdisciplinary team, for the patient, and for the long shared journey of transformation that brought back the true meaning of a smile and of the joy within our profession.

Case Summary


Gratitude for your attention!