

Abstract

Prosthodontics has been transformed by digital dentistry and the technology has expanded into supporting complex patient care scenarios. This clinical report describes the details of rehabilitation of the maxillary arch with six implants and implant supported fixed prosthesis utilizing fully digital workflow with Photogrammetry.

Initial Presentation

- ❖ 50-year-old healthy male with partially edentulous maxilla. The remaining teeth had poor prognosis due to limited coronal tooth structure left.
- ❖ CC: “I have several missing teeth and I can’t chew my food”
- ❖ Adequate alveolar quality and restorative space for maxillary implant-supported fixed prosthesis

Diagnostic Tools

- ❖ Comprehensive examination and medical history
- ❖ Intra-oral scans
- ❖ CBCT imaging
- ❖ Photographs
- ❖ Treatment plan

Photogrammetry Technology

Designed to make accurate calculations of 3D objects from 2D images. In implant dentistry, photogrammetry have been used to digitize the implant positions to the virtual working space of a computer-aided design (CAD) program utilizing optical markers^{1, 3}. Advantages in my treatment protocol:

- ❖ Delivering the provisional fixed prosthesis was accurate and time efficient
- ❖ Patient satisfaction with esthetics and function and appreciated the comfort of fully digital workflow²

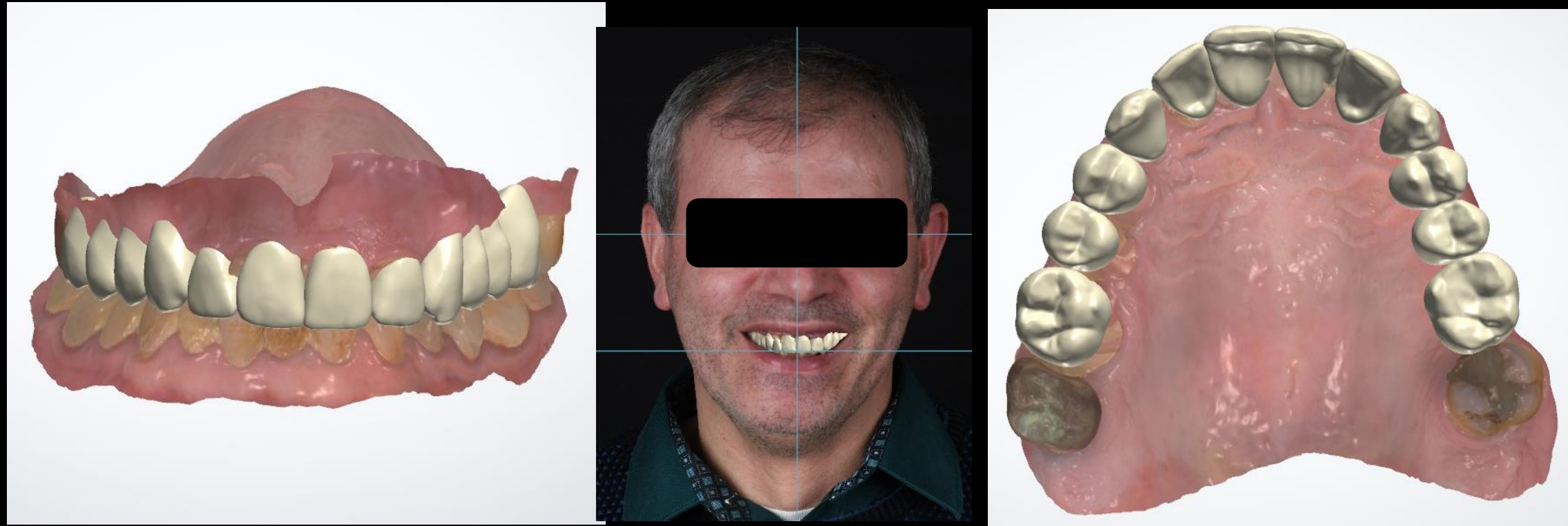
Clinical Presentation

Diagnosis and Treatment Planning

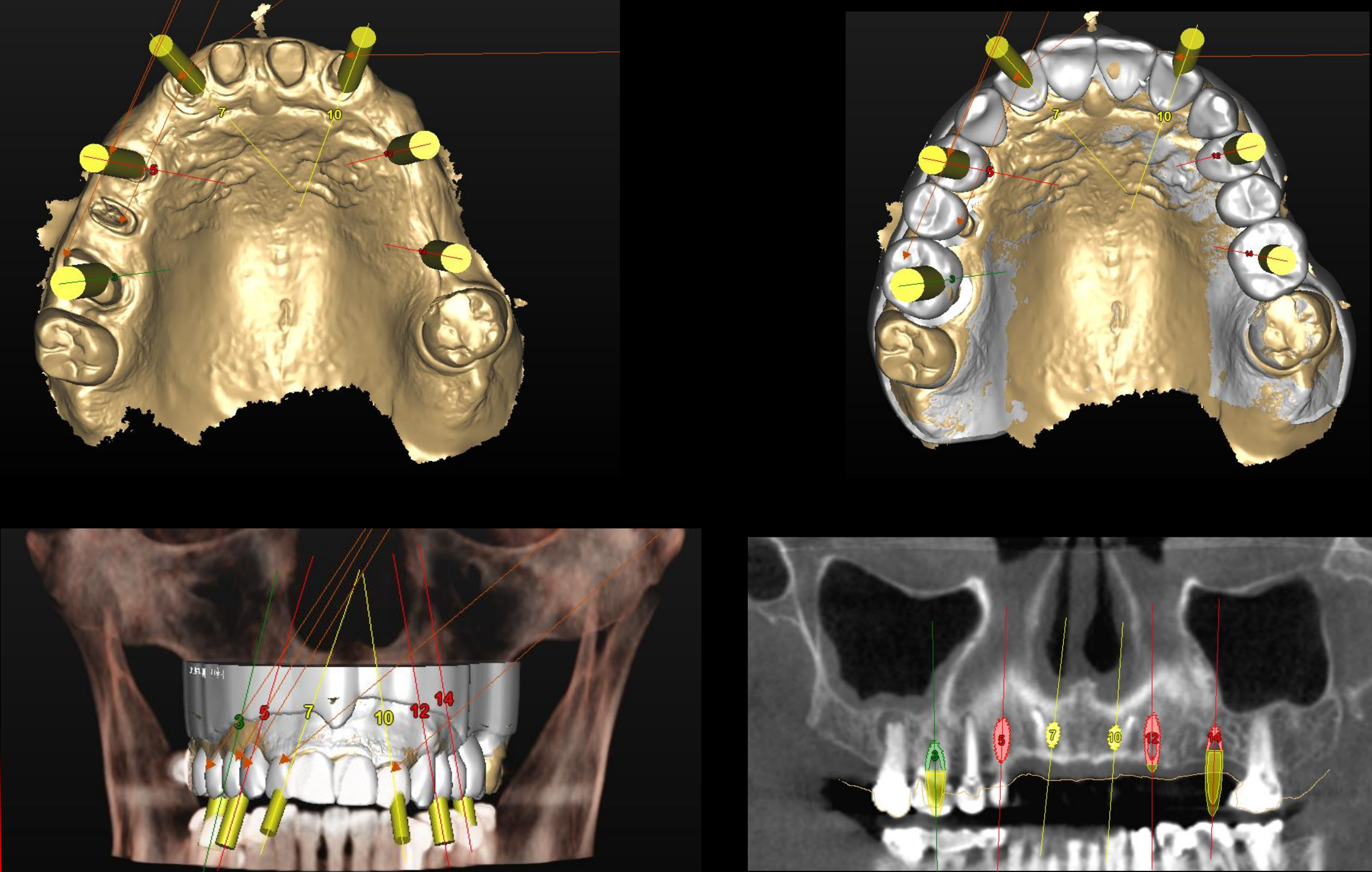
Initial Presentation



Digital Planning



Merged CBCT Surgical Plan



Surgery/Provisional Prosthesis

Maxillary Guide



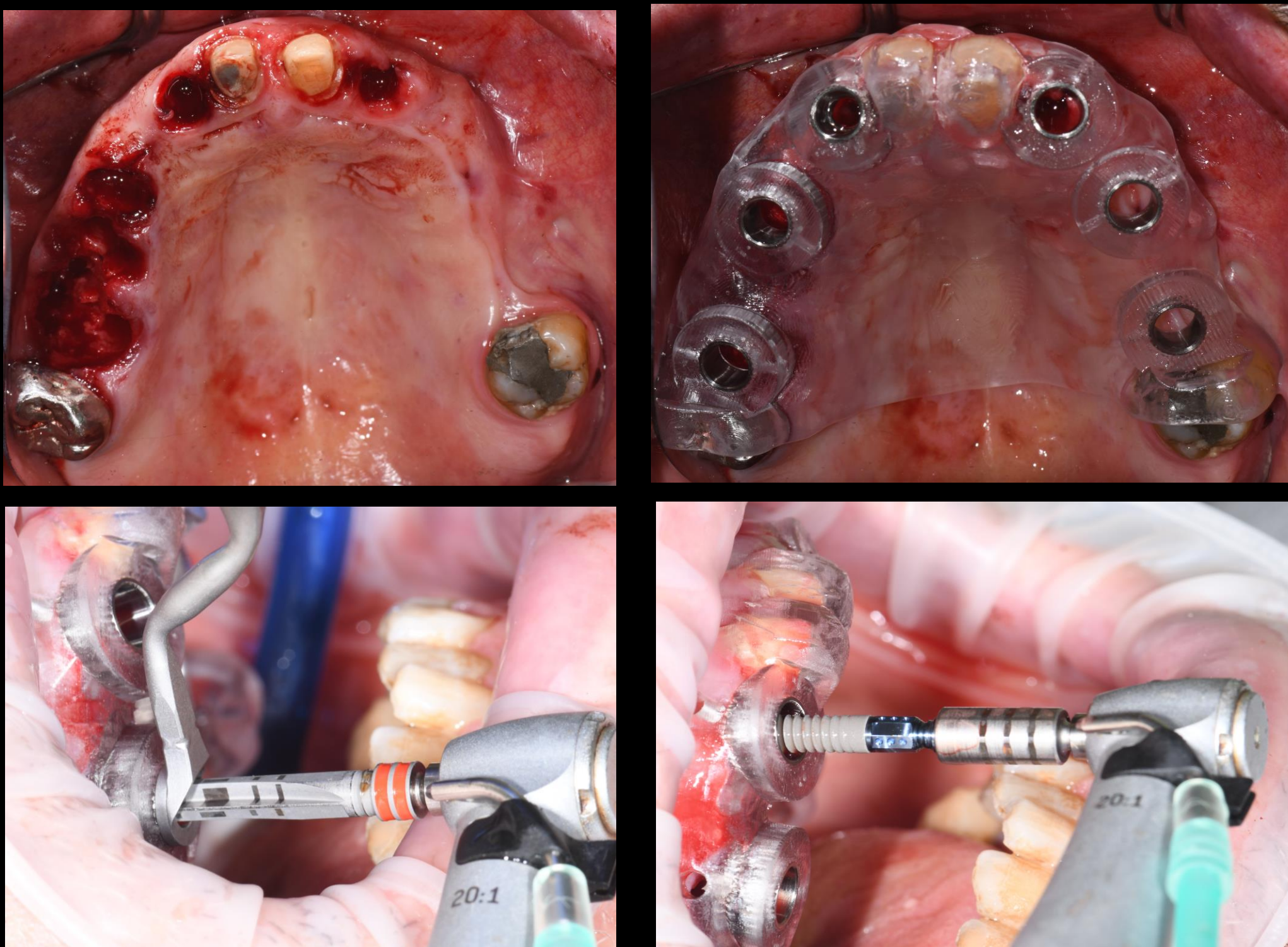
Abutment Alignment



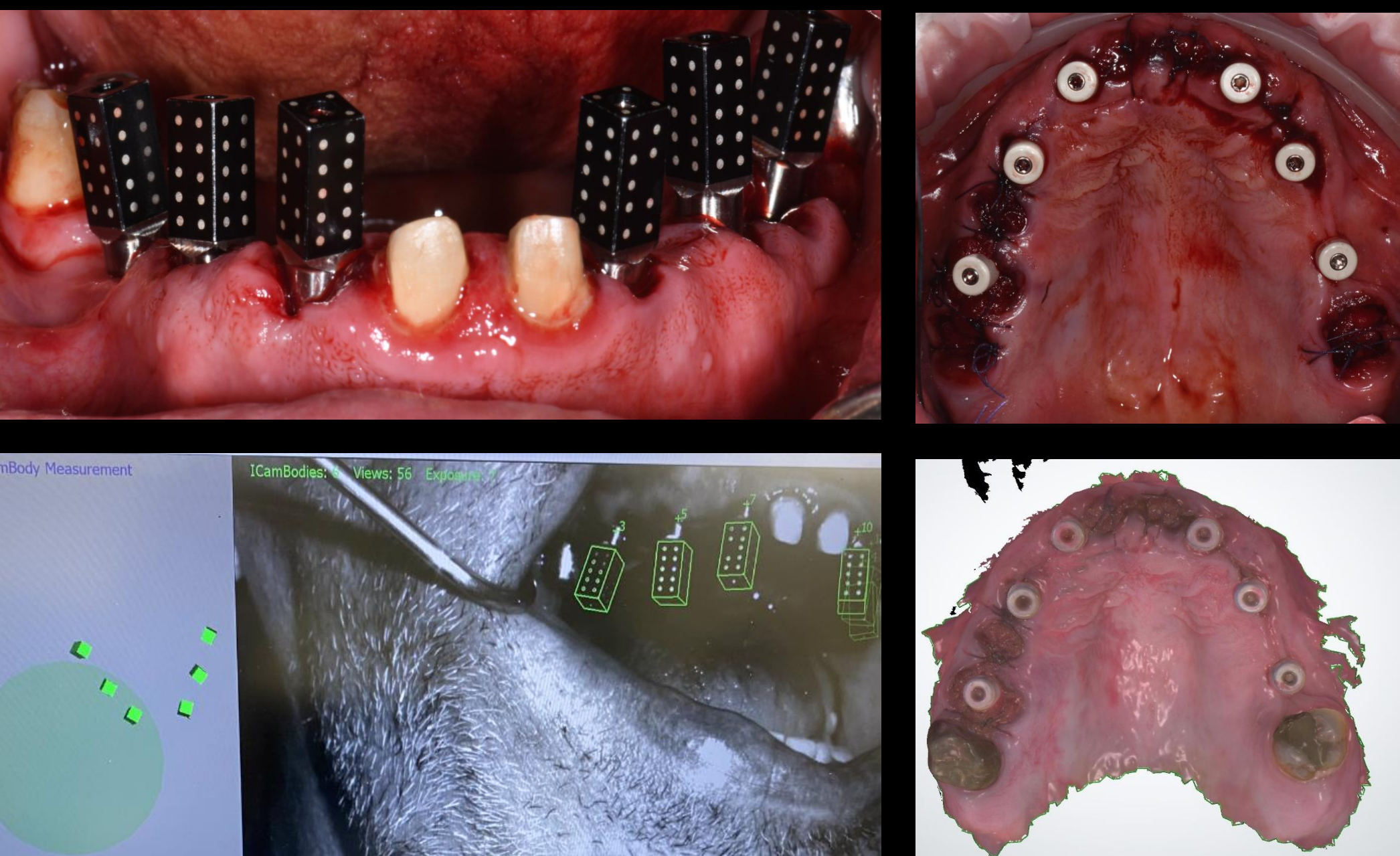
Provisional Prosthesis



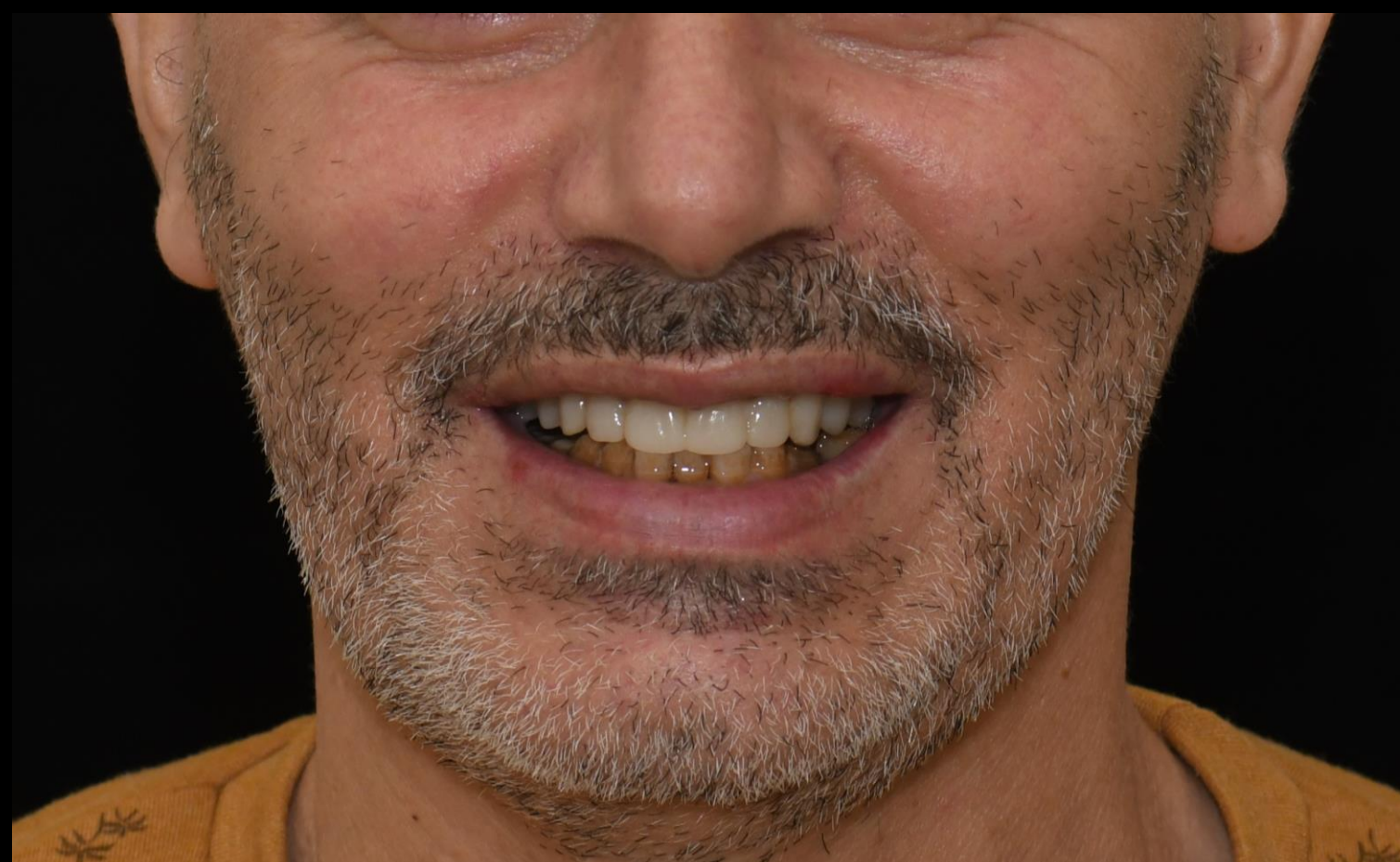
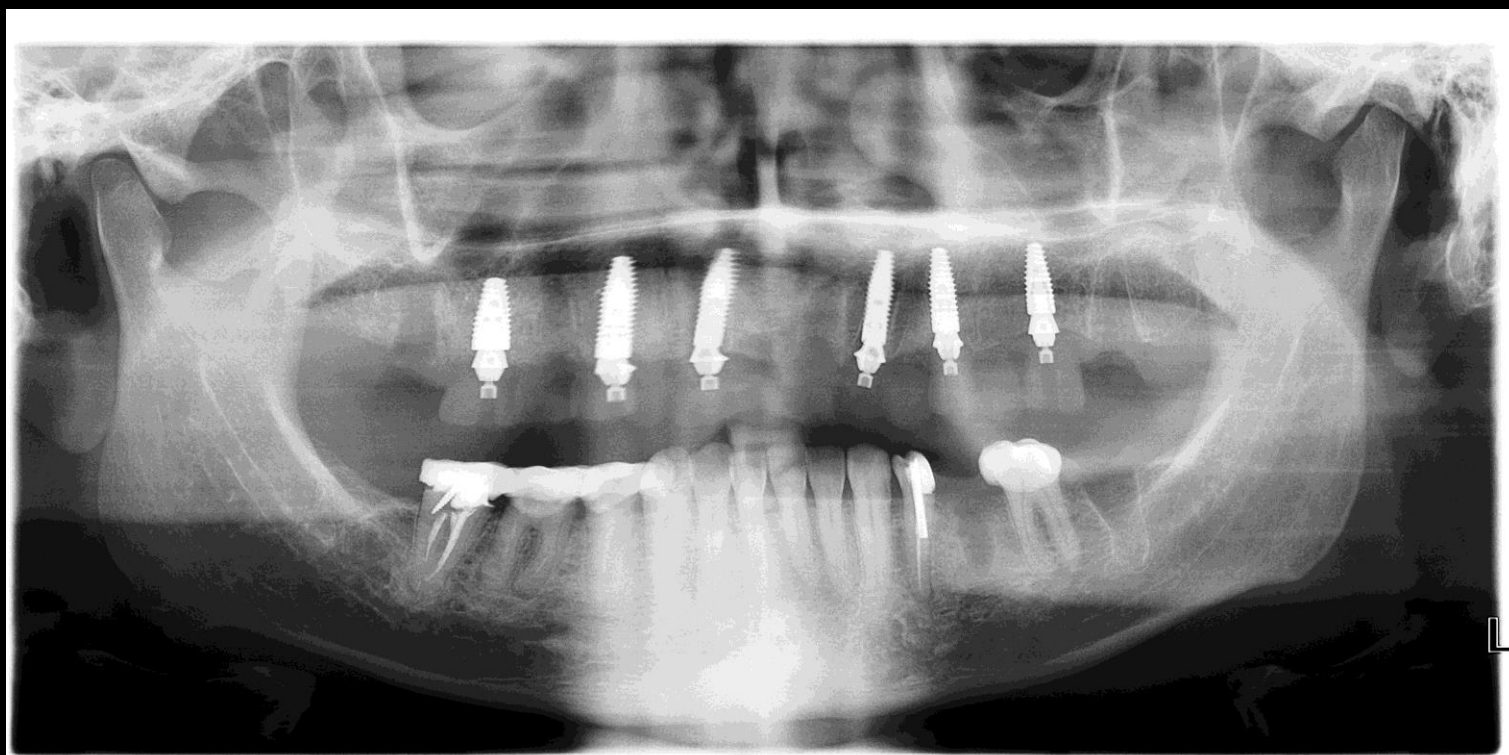
Surgical Sequence



ICam Bodies



Post Op



Treatment Sequence

	Clinical Workflow	Digital Workflow
Diagnosis & Tx Planning	❖ Comprehensive clinical exam of phonetic and esthetic evaluation including anterior display, smile line, incisal position, and buccal corridor ❖ Intra-oral scan, CBCT and Extra-oral pictures	❖ Digital wax up for full upper arch ❖ Existing teeth, Wax up and CBCT were merged ❖ Surgical planning of 6 maxillary dental implants ❖ CAD-CAM surgical guide and abutment alignment device were fabricated
Surgery/Interim Prostheses	❖ Staged Maxillary extractions then guided implant placements ❖ Recording the inter-implant spatial relationship using a stereoscopic camera and capturing soft tissue contours with an intraoral scanner ❖ Delivery of provisional fixed prosthesis	❖ Digital Wax- up, intraoral scan and photogrammetric impression were merged. ❖ Maxillary provisional fixed prosthesis was fabricated.

References

- 1- Revilla-León, Marta, et al. "Trueness and precision of complete-arch photogrammetry implant scanning assessed with a coordinate-measuring machine." The Journal of Prosthetic Dentistry (2021).
- 2- Sánchez-Monescillo, Andrés, et al. "All-on-four rehabilitation using photogrammetric impression technique." Quintessence Int 50 (2019): 288-293.
- 3- Bedrossian, Edmond Armand. "Complete digital workflow for complete arch implant therapy: Fact or fiction?." Journal of Prosthetic Dentistry 127.6 (2022): 821-822.

Acknowledgements

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