

Abstract

Chairside digital dentistry was first introduced in 1980 at University of Zurich, Switzerland, by Prof. Dr. Werner H. Mormann as CEREC system¹. It evolved through CEREC 1 (1987), CEREC 2 (1994), CEREC 3 (Redcam)(2000), 3D software (2003), AC Bluecam (2009), Biogeneric (3.8 software)(2010), 4.0 software (2011), Omnicam (2012), Primsan (2019), 5.0 software (2019). Digital chairside reconstruction dentistry, including full mouth reconstruction became possible with CEREC in 2009 with Bluecam and Biogeneric software (version 3.8). Occlusion scheme, overjet, overbite, arch form and occlusal plane were developed with virtual articulator. Since Primescan & 5.0 software were introduced in 2019, the system makes it even easier in chairside dental reconstruction & esthetic reconstruction. A new outstanding feature in 5.0 software is to modify/change VDO on the fly as the reconstruction design is carried out in the design phase.

This case report demonstrates full mouth reconstruction using chairside intra-oral scanner, CAD/CAM software and milling machine. Centric relation (CR)/ centric occlusion (CO) relationship was secured with anterior jig, then scanned into the CAD/CAM software for final prosthesis design. VDO, Occlusion scheme, overjet, overbite, arch form and occlusal plane were tried, tested, and developed with the virtual articulator setting. Final esthetics was determined with virtual models vs. pretreatment digital models, as they were all overlapped in the software for references during final prosthesis design phase.

Introduction

The 40-year-ole male patient presented for a consultation and treatment with chief complaint: “My jaw is constantly hurting, sometimes I even have advanced headache. This happened right after my full mouth reconstruction done by a general dentist two years ago.”

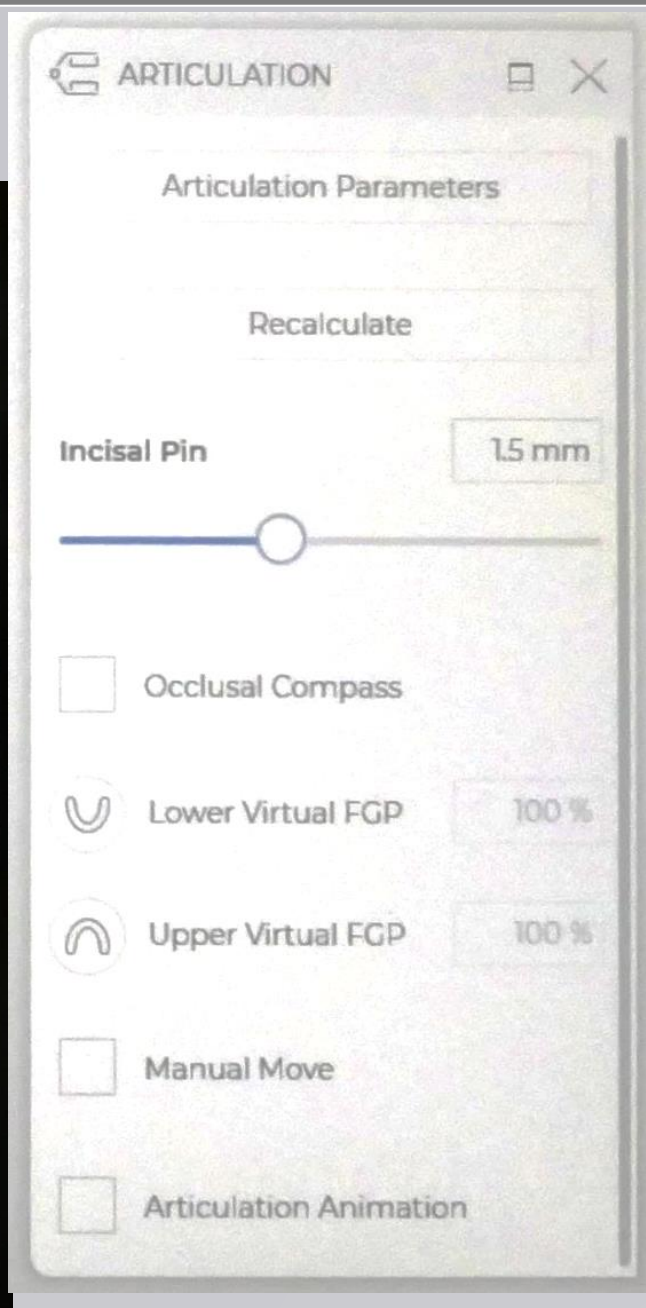
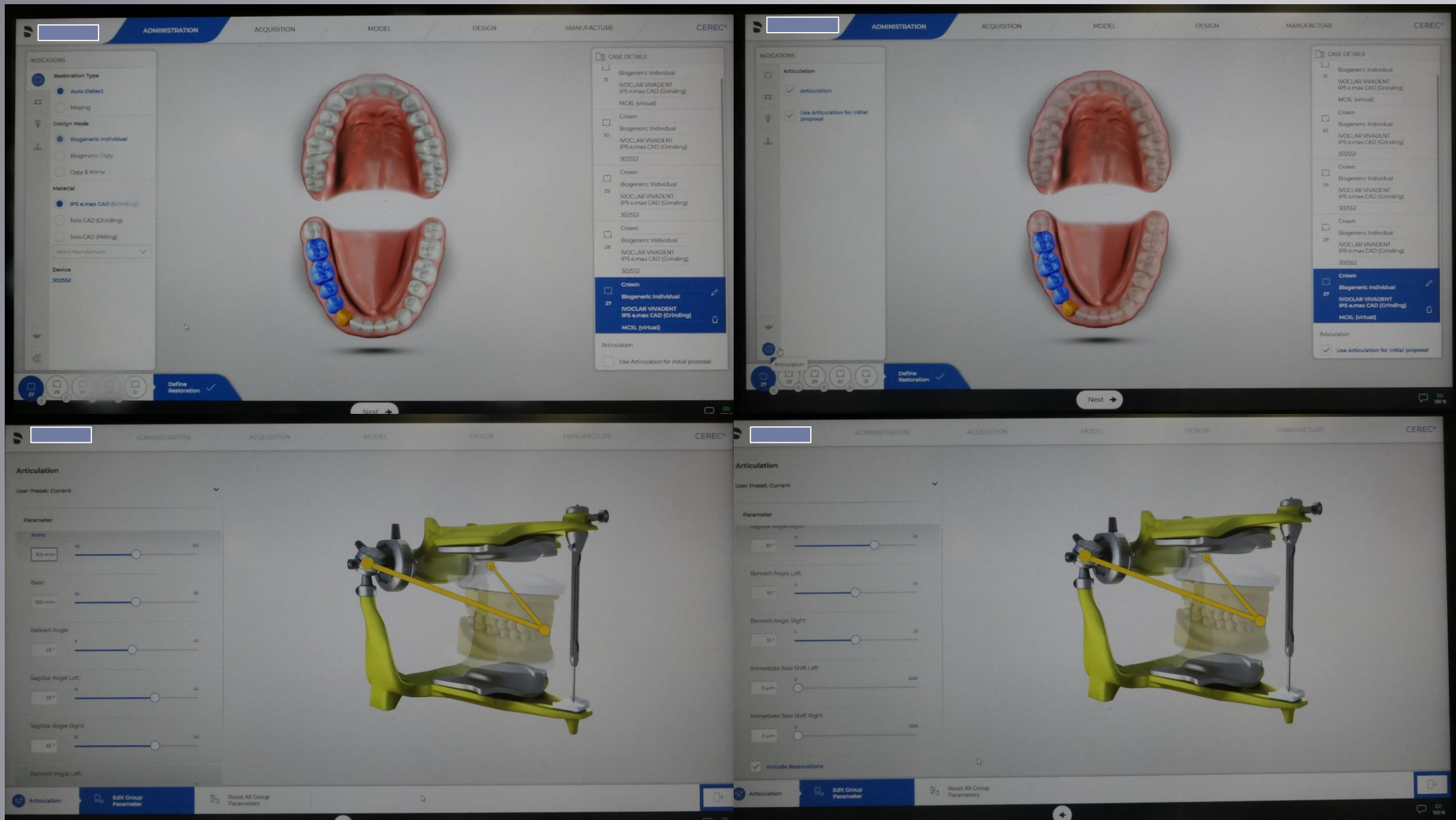
Problem list: 1. Occlusion bite down only on the left side in CR. 2. Uneven occlusal plane between right and left. 3. Uneven posterior overjet, with left side in edge-to-edge. 4. Reduced anterior overjet. 5. uneven occlusion⁴. 6. Reduced VDO causing occlusion problem and TMD⁵.

Due to several of these 2-year-old crowns fell out, a new reconstruction was initiated with chairside CAD/CAM system. Diagnosis models of pre-treatment and CR/CO bite registration were scanned and analyzed.

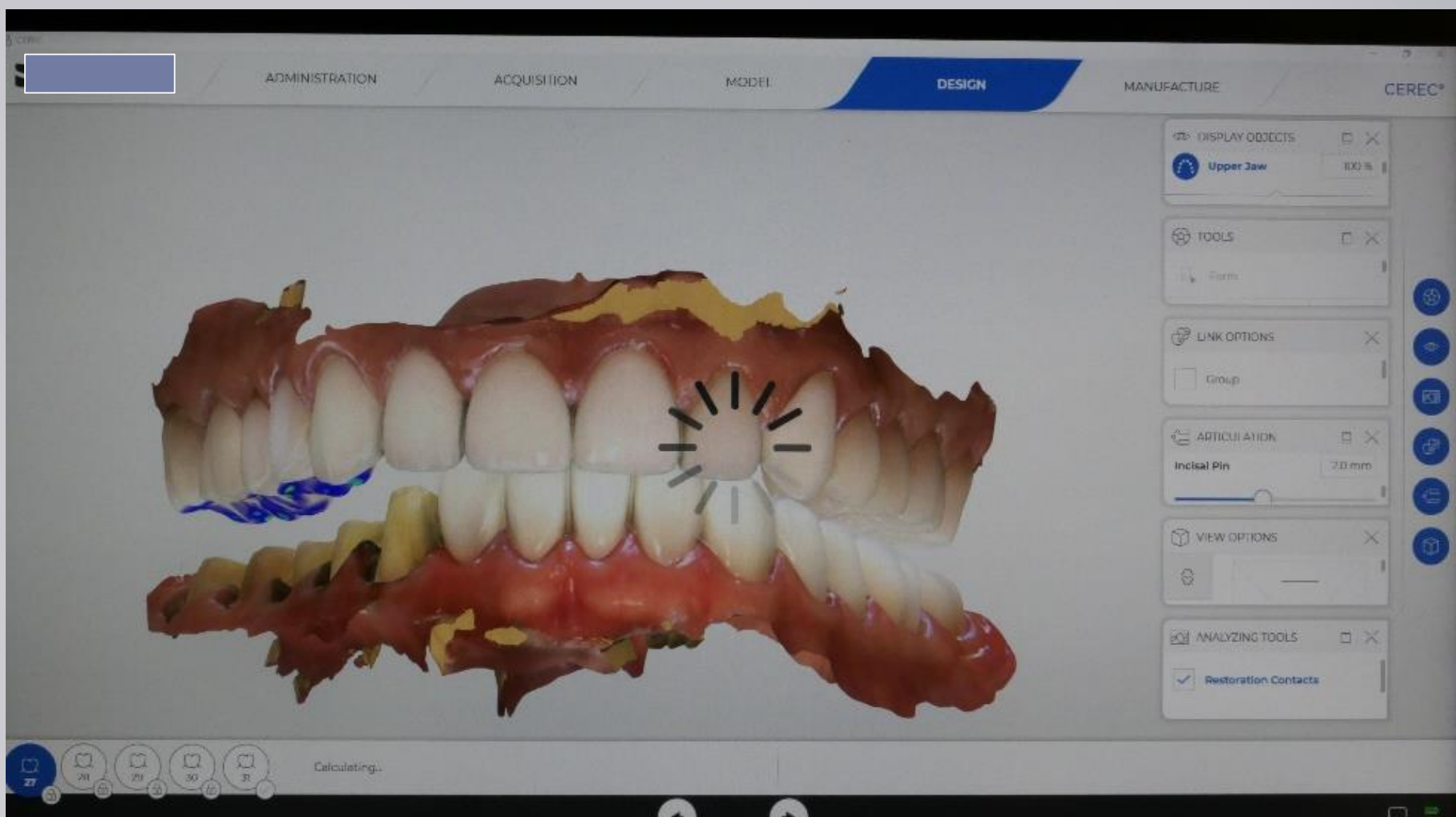
With the advantage of the software “Articulator function”, final restorations of different VDO setting were virtually generated and compared. With change of VDO, the overbite and overjet were changed, as well. Increased VDO will reduce overbite and increase overjet. Final VDO height was determined according to occlusion design, which was within the VDO range according to freeway space and phonetics.

Chairside CAD/CAM Occlusal Design with VDO Alterations and Clinical Sequential Treatments

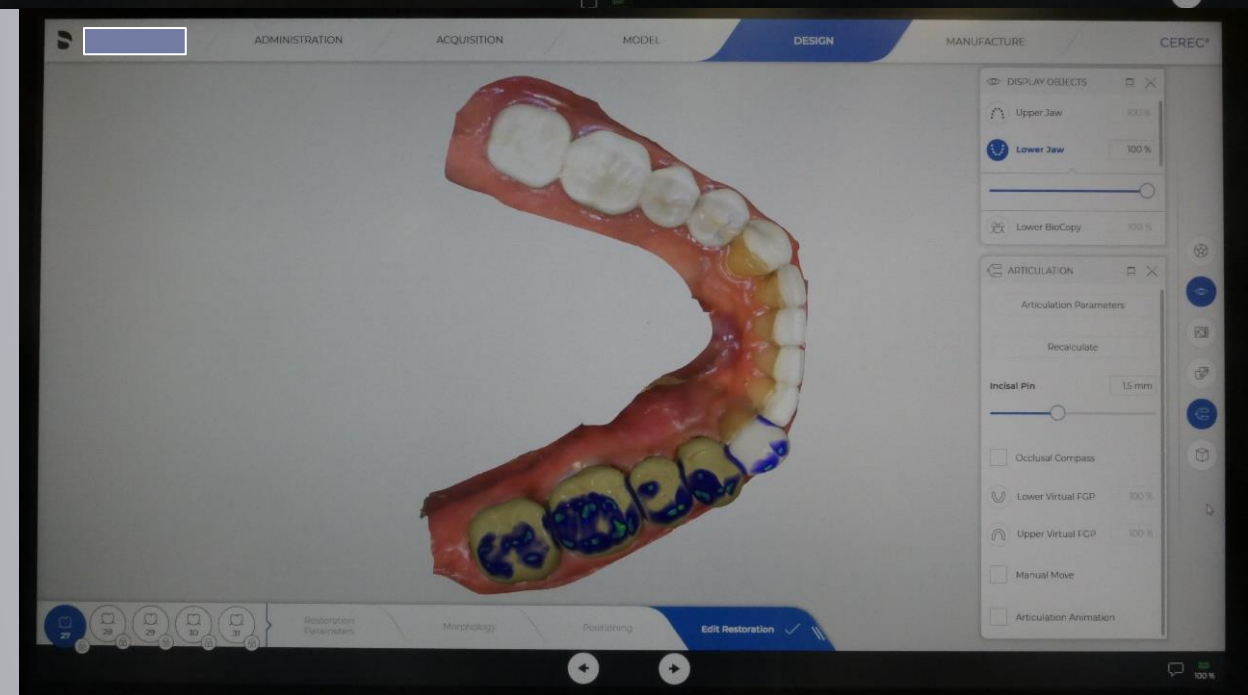
Virtual Articulator and VDO Setting



Restorations with VDO set at 0.0mm



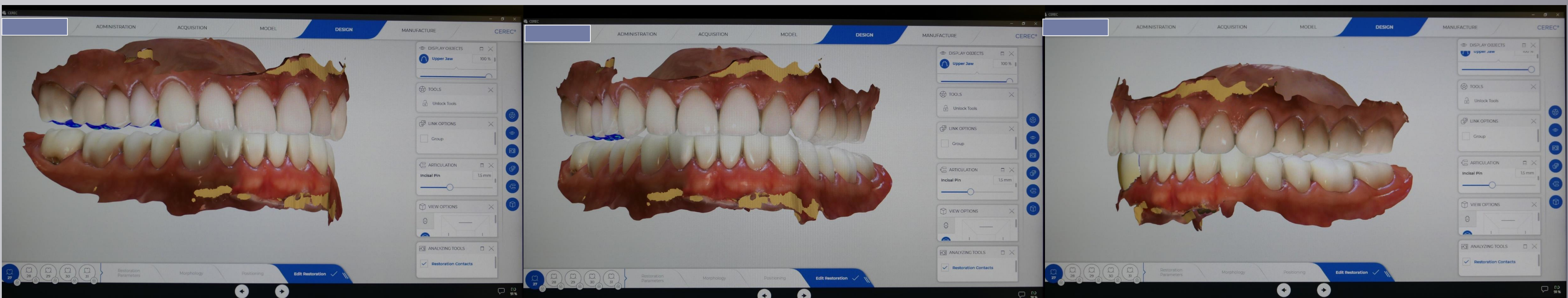
Treatment Completion of Lower Posteriors



Occlusal Analysis



VDO with Raised Incisal Pin 1.5mm



Jig to Secure CR/CO



Conclusion

“Articulator function” in the chairside CAD/CAM CEREC software 5.0 and above have a major advantage in reconstructive dentistry. Its “Incisal Pin function” provides a fly change of the VDO settings for the final restoration proposals.

Once the occlusion bite registration is obtained in CR, the digital occlusion has extremely high precision, vs. conventional PVS bite registration. With that, highly accurate final restorations in different VDO settings will come.

Different final restorations with different VDOs, also including different occlusal plane, overjet, overbite could be instantly compared in virtual.

References

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