

Implant Prosthetic Rehabilitation Utilizing Digital Full Arch Scanning with Nexus IOS as an alternative to analog workflow: A Case Report

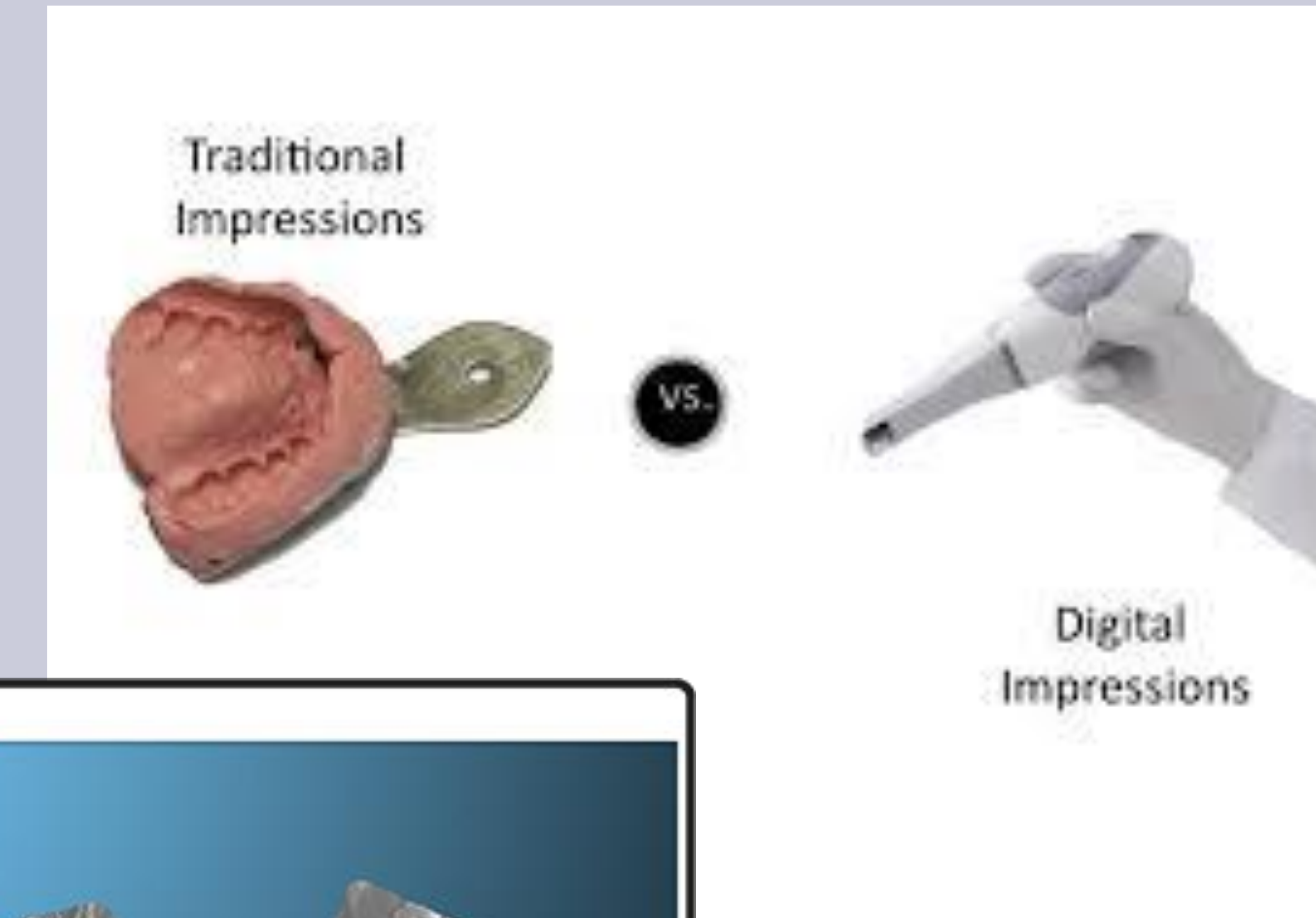
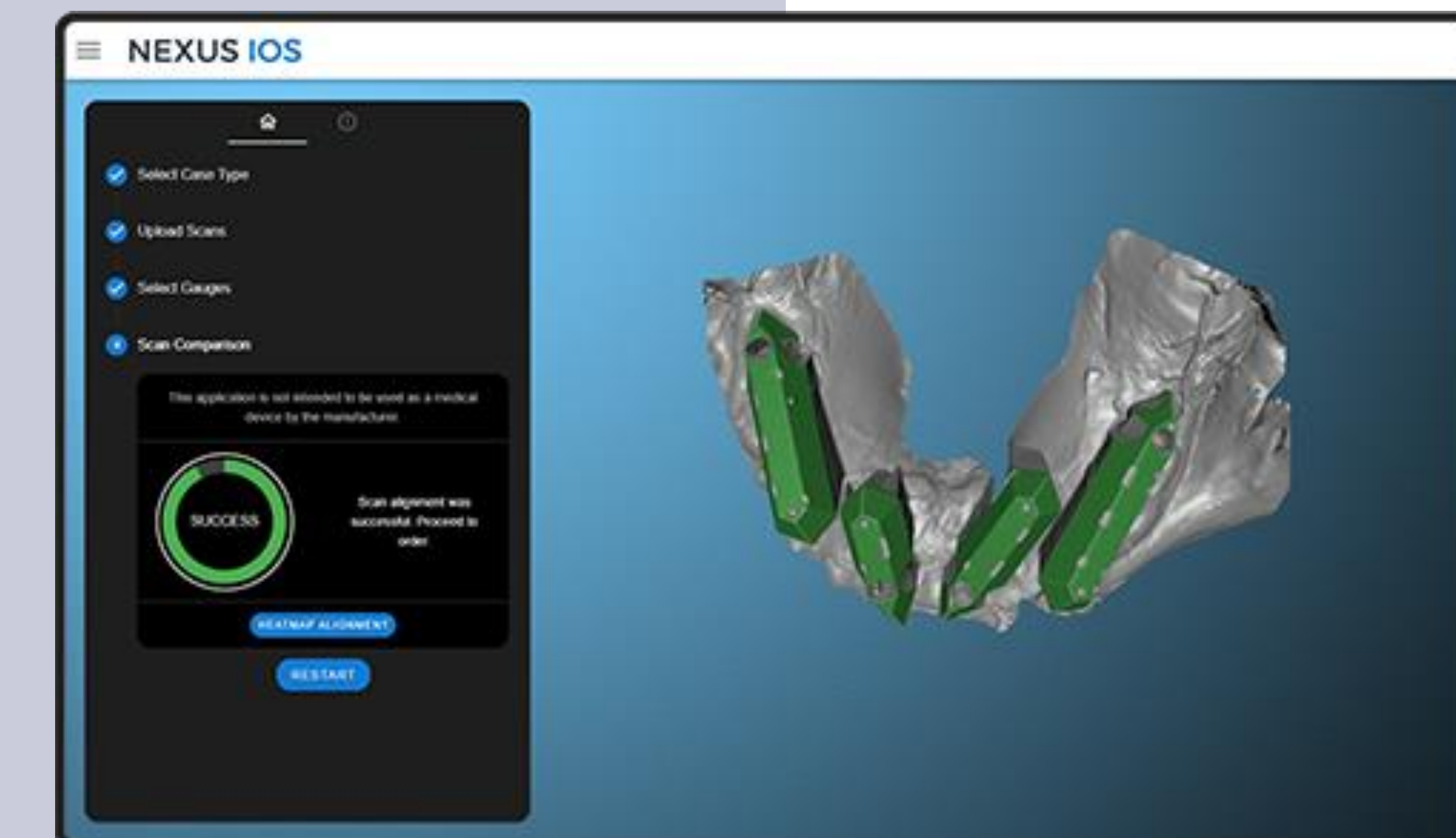
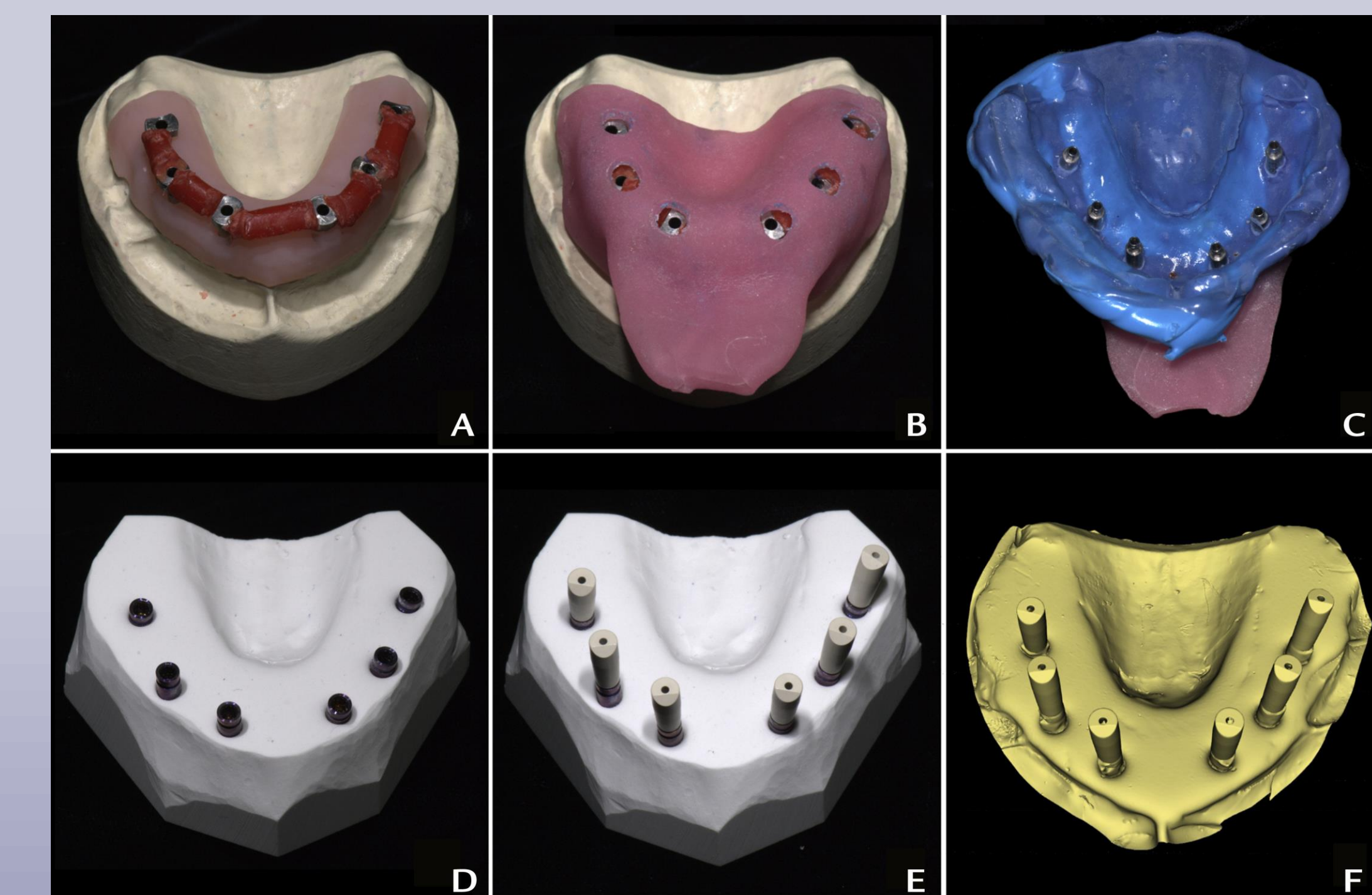
Amir Akhras, D.M.D; Mohamed Omran-Alfaituori, B.D.S, M.S; Robert L. Blackwell, D.D.S

Introduction:

- Traditional workflows for full arch restorations often involve tedious steps including PVS impressions, verification jigs, maxillo-mandibular relation records, multiple try-in appts.
- Digital dentistry is constantly evolving and capable of changing therapeutic strategies, clinical methods, and materials that can be used in everyday practice.
- The scientific literature contains several studies supporting digital dentistry in daily clinical practice, hypothesizing its wide diffusion in the years to come.^[1]
- For single implant-supported crowns, authors report a better accuracy of the entire digital workflow. ^[2]
- Systematic reviews conducted on this topic agree on the time efficiency of digital impressions, which are faster and better tolerated by patients. ^[3]
- The advantages are considerable, in terms of execution, patient comfort, and accuracy, but their comparison with analogic flow is still under debate. ^[4]

Purpose:

- The purpose of this report was to recognize that traditional analog workflows utilizing pick-up impressions, verification jigs, and wax and cast metal framework has its' limitations with precision and accuracy in today's digital era as compared to using the Nexus IOS digital workflow.



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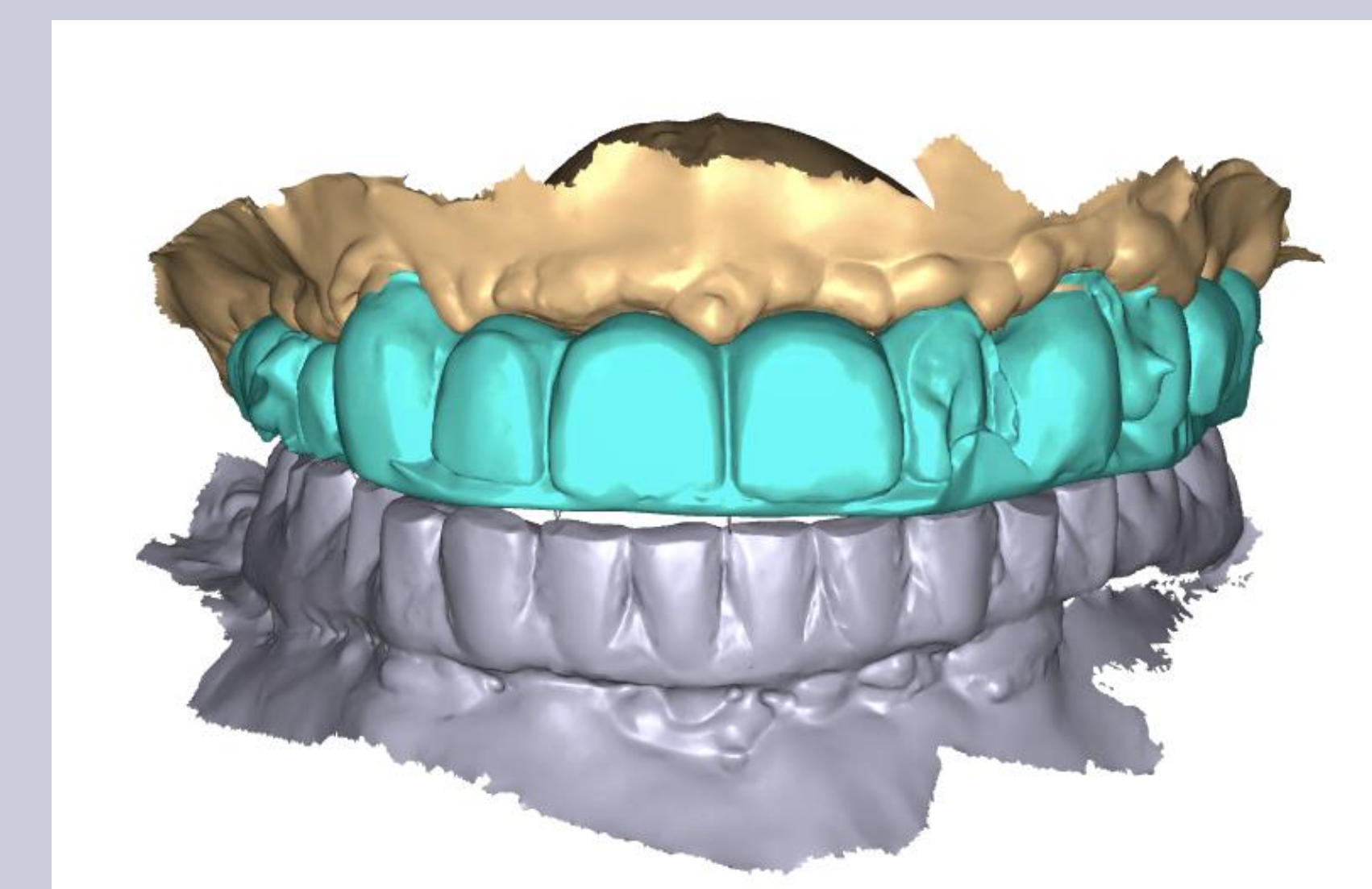
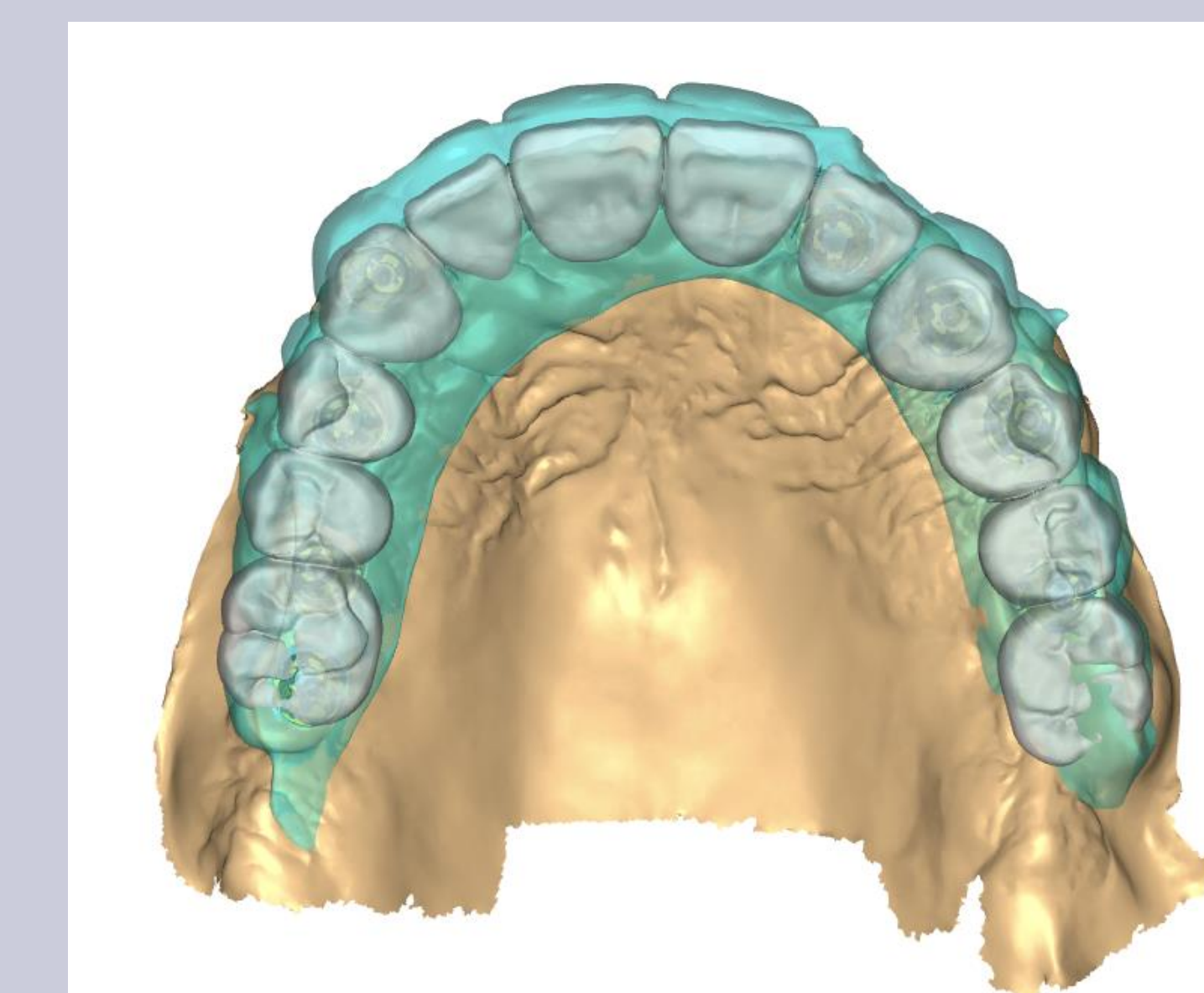
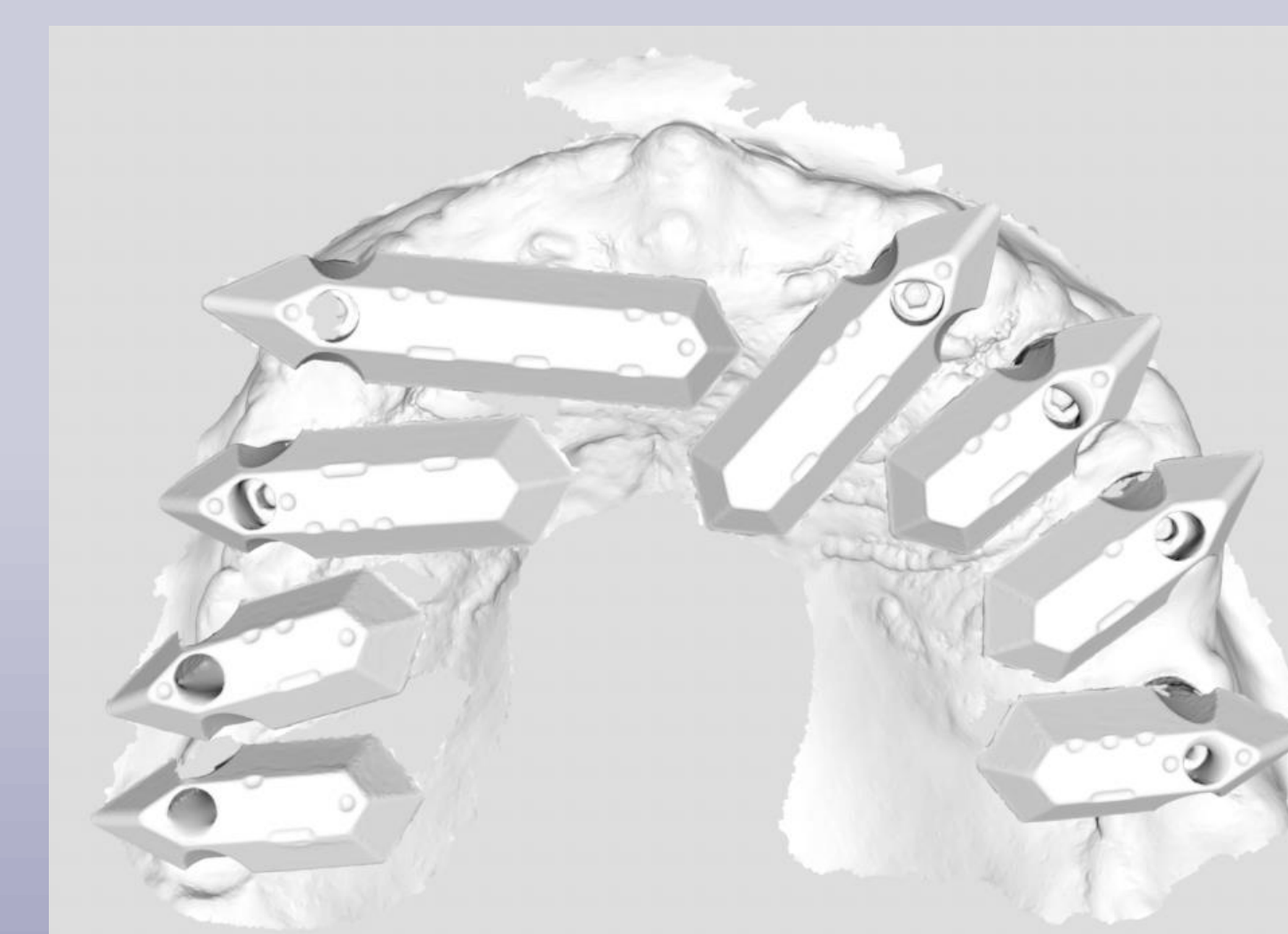
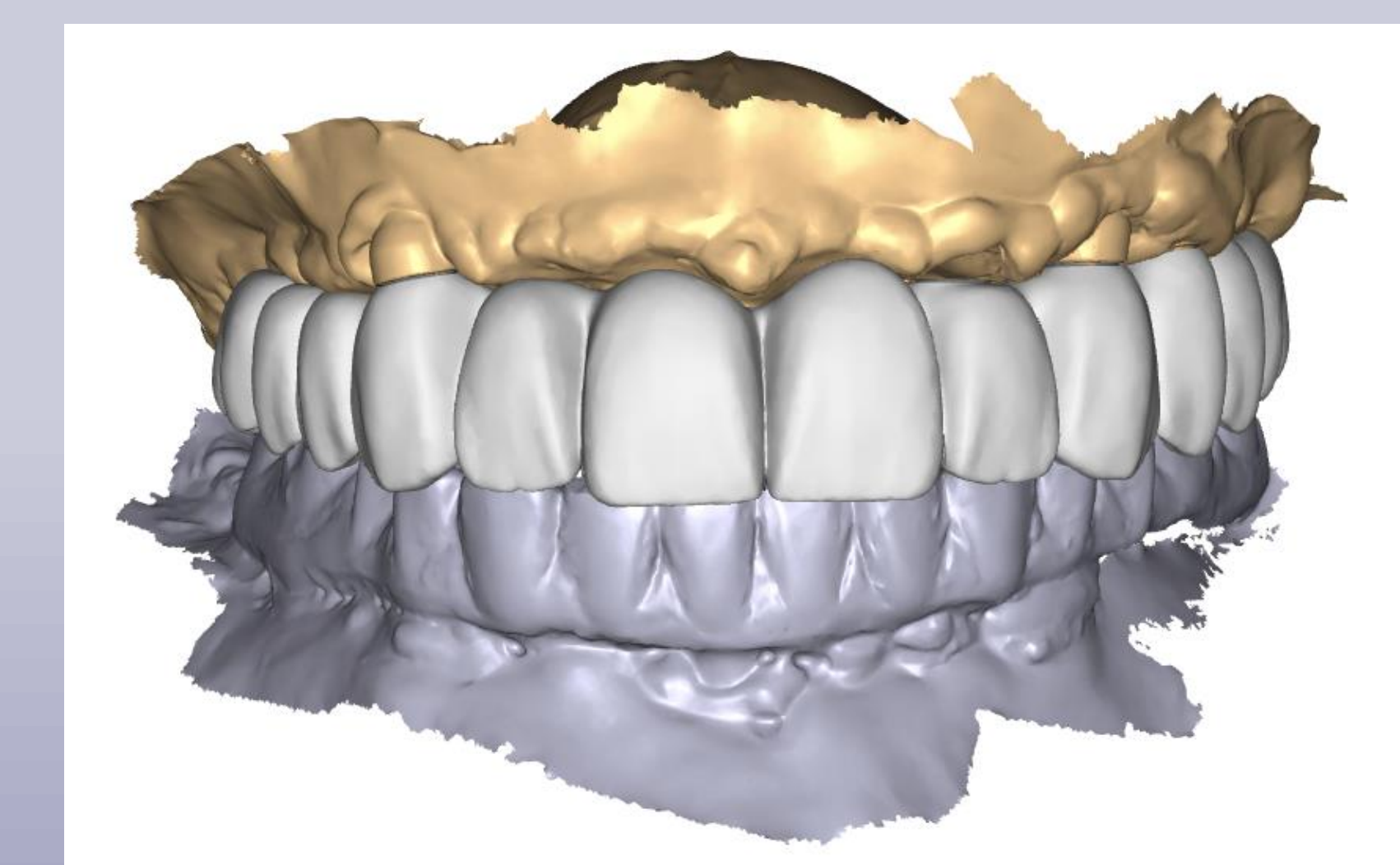
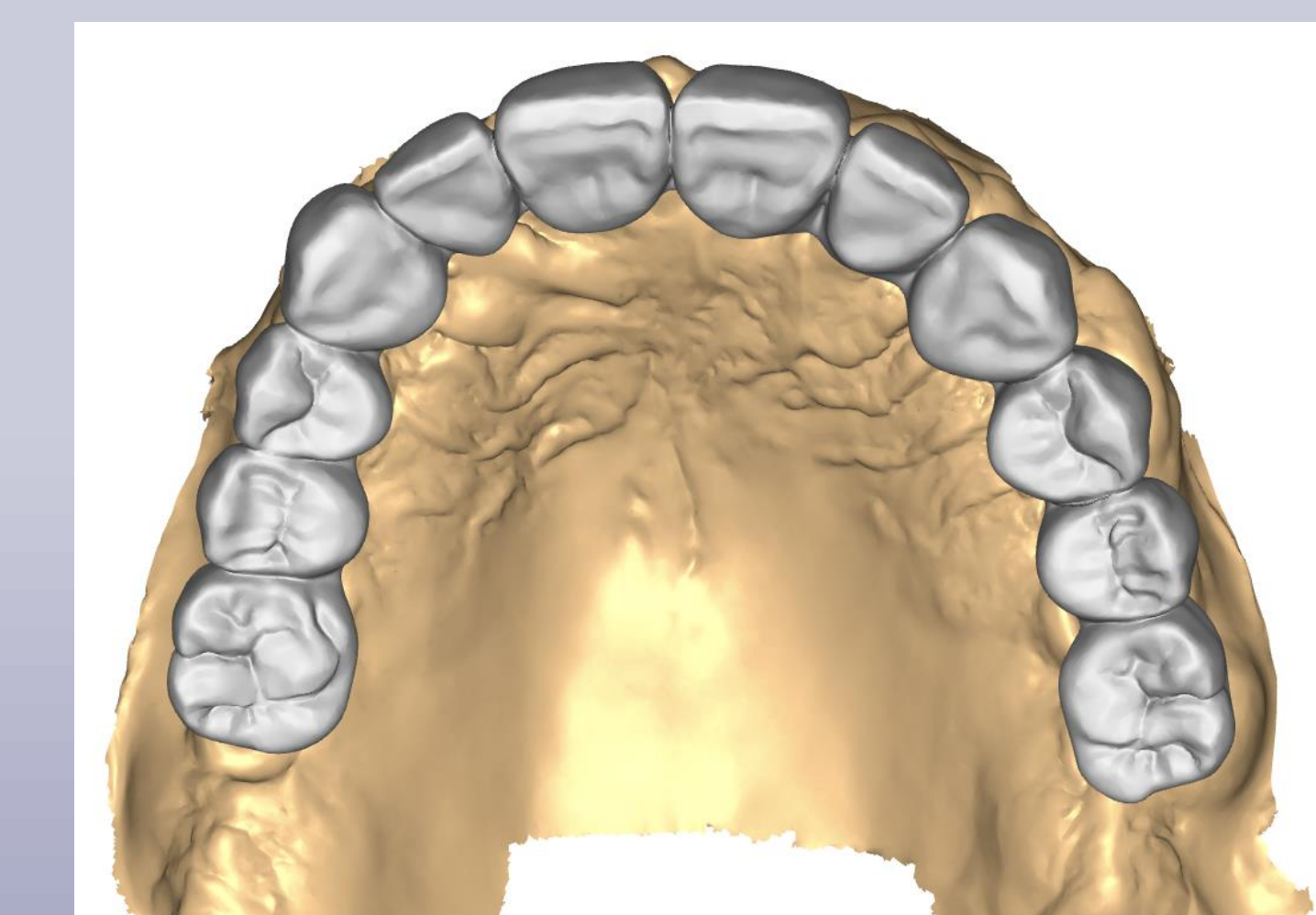
Methods & Materials: Analog Workflow

- This case started as a traditional direct to implant with UCLA abutments that were wax and cast to make a final prosthesis.
- The prosthesis wasn't fully passive and had to have 2 angle corrected custom abutments that would be cemented for the final.
- However, due to the long span, inaccuracies in casting and a decline in the analog workflow, an alternative method was implemented.
- The alternative was to add MUAs and utilize a full arch scan gauge system, Nexus IOS, with an intraoral scanner, Trios 4, that were then used in this case.



Methods & Materials: Digital Workflow

- An alternative method was then implemented. This method involved the need to place multi-unit abutments (MUAs) and utilize a full arch scan gauge system, Nexus IOS in this case, with an intraoral scanner, Trios 4, that were used to capture the implant positioning.
- It also involved additional steps to capture the soft tissue, intaglio of existing full arch prosthesis in order to mesh the data and design a definitive prosthesis.
- Printed try-ins printed with Straumann P Pro Crown & Bridge resin for the patient to test in function and adjust where needed.

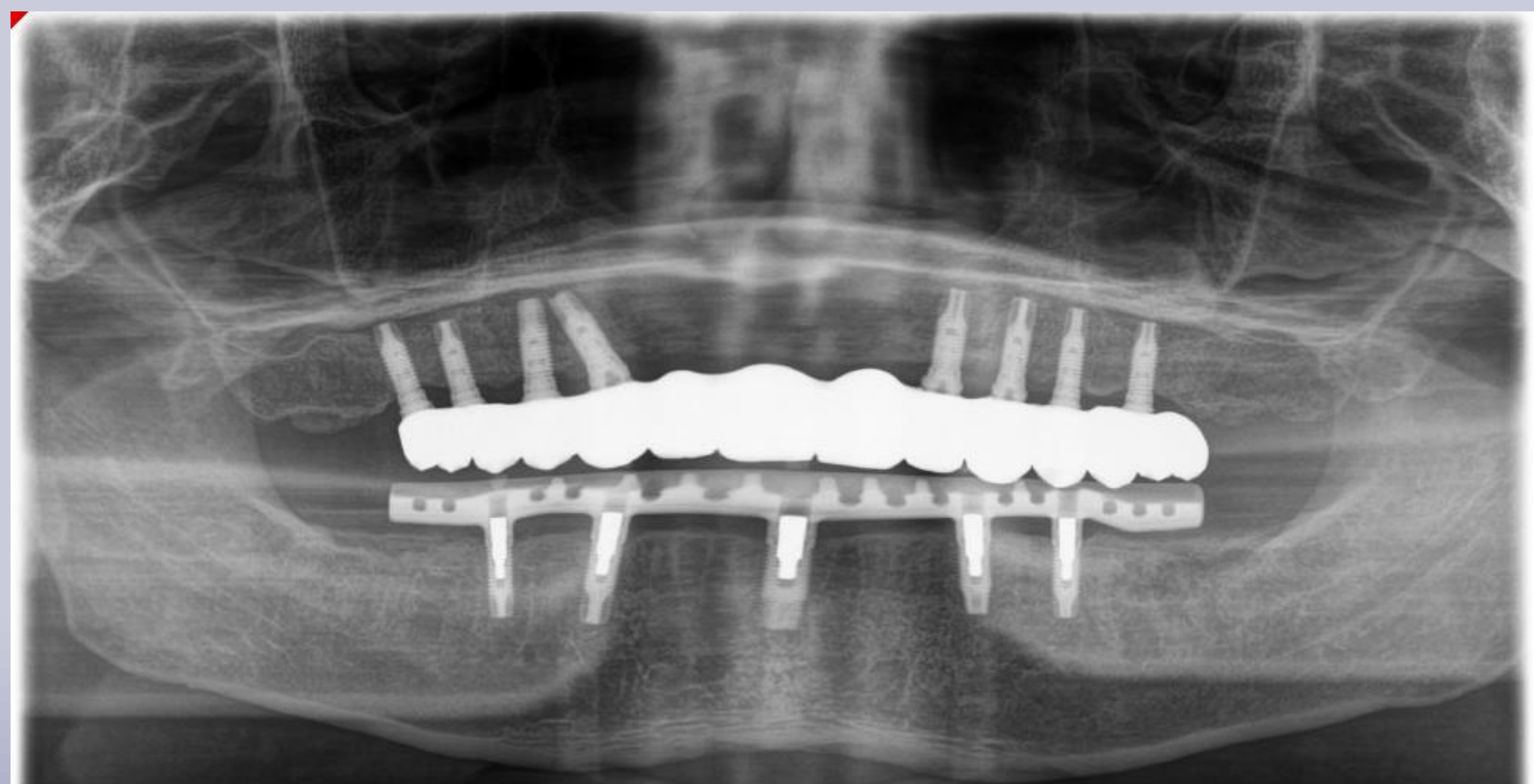


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Results:

- The printed try-in temporary was delivered and tested in function for a 2-week period to allow the patient to assess function, phonetics, and esthetics.
- Patient indicated no changes to tooth positions, no esthetic requests
- The final prosthesis was delivered after one esthetic try-in appointment.
- Final prosthesis is Nexus hybrid: titanium bar substructure with zirconia overlay





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Discussion:

- The is not only the advantage of superior time savings in a digital method of capturing implant positioning, but it also brings about a better patient satisfaction from the reduced appointments it takes to get to a try-in stage as compared to an analog workflow.
- The initial analog workflow was worked on three times to section the metal framework as there was passivity issues, but it ultimately never came to fruition. The patient was given the option to continue to try as he wanted the same material prosthesis, he has existing.
- After showcasing the Nexus IOS workflow and how fast we could provide a temporary for him to remove his broken prosthesis, it provided the patient a more practical option to fast track the case to get him in a fixed temporary try-in.
- In addition, since the workflow is completely digital, there is no verification jig or PVS impressions with open tray coping, rather the Nexus IOS system provide a platform to check on the spot whether the scanning of the scan gauges are accurate and precise enough to proceed with the design of the prosthesis.
- There is clear indication that the system works sufficiently well and has had no passivity issues even when assessing the printed try-ins.

Conclusion:

- Full arch restorations are on the more complex side of implant dentistry. Scanning for single implant crowns is precise enough as there is sufficient capturing of information with the IOS scanners.
- When it comes to full arch scanning with scan flags it can cause distortion of the scanning as there is a large gap between each scan body. With the Nexus IOS 2.0 scan gauge system and it's horizontal, individually decoded scan gauges for each specific system there is perfect calculation of where the scan gauges reside among each other.
- The system provides ample information that they can combine the precise implant positioning along with various other intermediate scans to provide a working precise and accurate try-in.^[5]
- This significantly reduces the time to provide a try-in for the patient to assess and function with it to address any modifications they choose. What once took 4 or more appts to get to a try-in stage takes 2 appts.
- This is just once case report to showcase the difference between the tedious traditional analog workflow as compared to switching to a digital workflow to provide a truly precise and accurate definitive prosthesis.

References:

- [1]: 1. Joda T, Zarone F, Ferrari M. The Complete Digital Workflow in Fixed Prosthodontics: A Systematic Review. *BMC Oral Health*. 2017;17:124. doi: 10.1186/s12903-017-0415-0.
- [2] Ren S, Jiang X, Lin Y, Di P. Crown Accuracy and Time Efficiency of Cement-Retained Implant-Supported Restorations in a Complete Digital Workflow: A Randomized Control Trial. *J. Prosthodont*. 2022;31:405–411.
- [3] Joda T, Zarone F, Ferrari M. The Complete Digital Workflow in Fixed Prosthodontics: A Systematic Review. *BMC Oral Health*. 2017;17:124. doi: 10.1186/s12903-017-0415-0.
- [4] Spalthoff S, Borrmann M, Jehn P, Rahlf B., Gellrich N.-C., Korn P. Comparison of Conventional and Digital Workflow for Dental Rehabilitation with a Novel Patient-Specific Framework Implant System: An Experimental Dataset Evaluation. *Int. J. Implant. Dent*. 2022;8:4. doi: 10.1186/s40729-022-00405-7
- [5] Giglio GD, Giglio AB, Tarnow DP. A Paradigm Shift Using Scan Bodies to Record the Position of a Complete Arch of Implants in a Digital Workflow. *Int J Periodontics Restorative Dent*. 2024;44(1):115-126. doi:10.11607/prd.6733