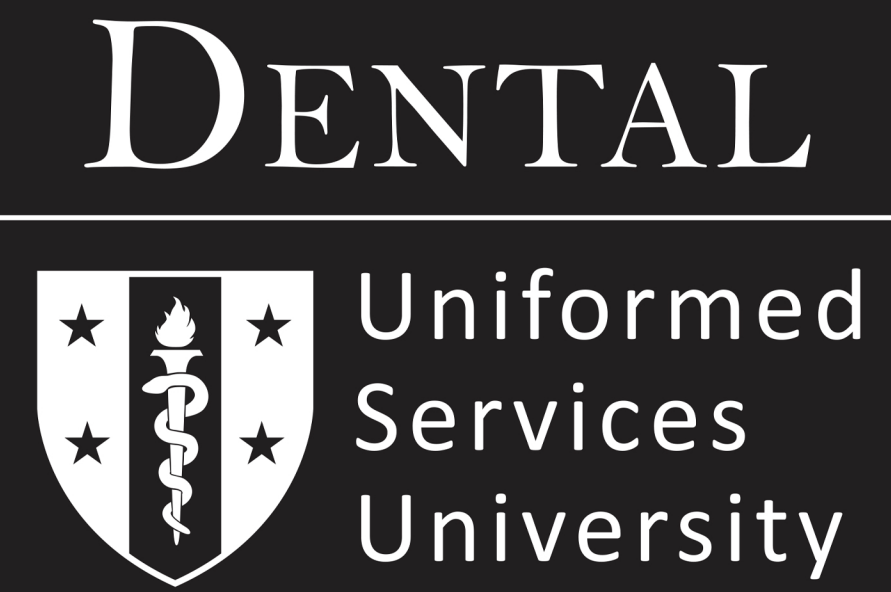




Utilizing Digital Facial Scanners to Improve Virtual Wax-up Success

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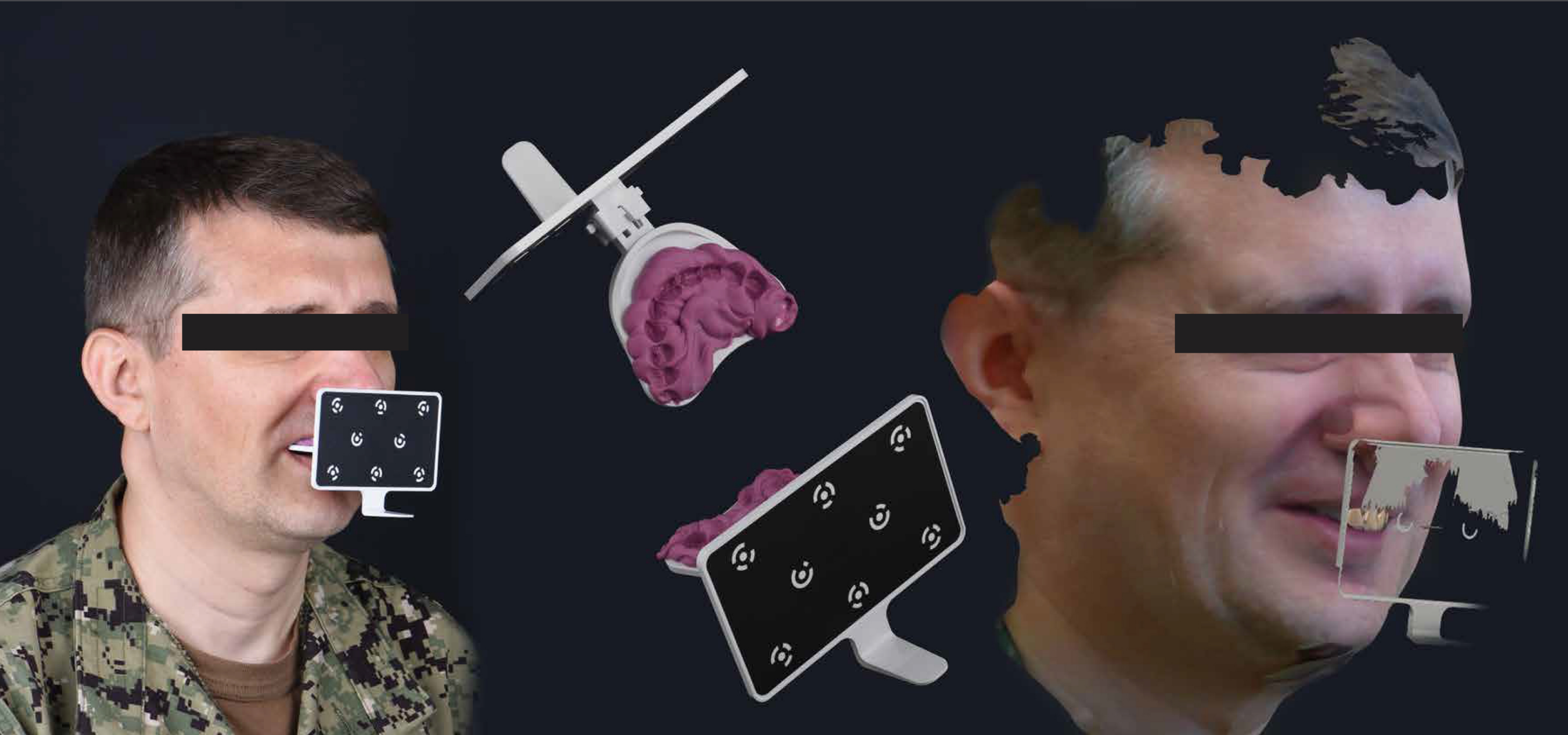


Background

Diagnostic wax-ups are a vital tool for creating a shared vision between clinicians, patients, and lab technicians. Prior to irreversible treatment, patients are able to determine if their treatment goals can be functionally and esthetically met. Both traditional and digital methods can be utilized to complete diagnostic wax-ups.

Traditional	Digital
Requires properly articulated casts	Can be time-saving
Labor intensive	Needs proper reference planes in a virtual space
May have discrepancies in midline or incisal edges during a mock-up	Requires technician with digital background and skills

Facial scanning technology has been applied to help provide a soft tissue framework with anatomic landmarks that help orient digital casts within the digital workspace.



The DOF Target Plate and Bite Plate orient the 3D facial scan to the intra-oral scan.

Purpose

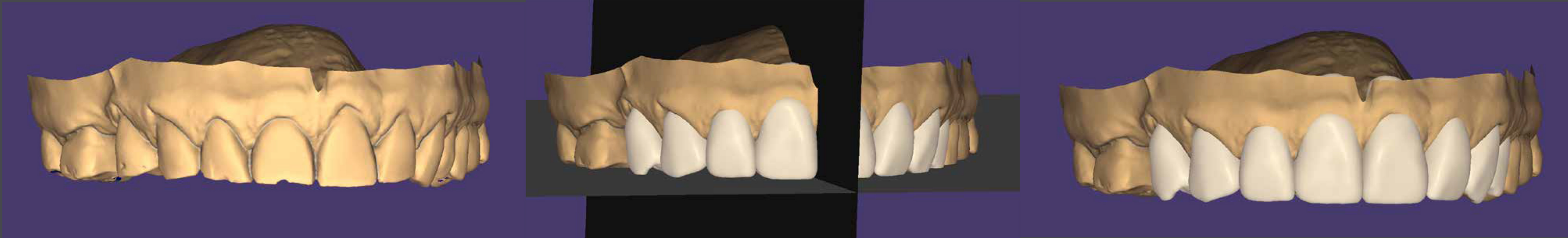
To demonstrate the benefits of incorporating three-dimensional facial scans to introduce reference planes when designing digital wax-ups. Advantages and disadvantages to this method are reviewed.

Materials and Methods

Intra-oral scans were completed of the patient's dentition with the 3Shape Trios 3 scanner. Three-dimensional facial scan was completed using the DOF SNAP scanner. A virtual wax-up of the maxillary anteriors was completed in exoCAD and exported as a single STL file. Digital wax-ups and clear silicone matrix were additively printed by SLA printing. An esthetic mock-up was performed directly utilizing a silicone matrix and bis-acryl. Corrections were made intra-orally and a new scan was performed to utilize for final restorations.



Intra-oral scans are merged with the SNAP plate, allowing alignment of intra-oral and extra-oral scans and creation of facial planes.



Virtual wax-up are designed on top of the intra-oral scans and the orientations can be checked against the reference planes created based on the extra-oral scan.



The finalized virtual wax-up can then be compared to the facial scan to verify proposed esthetics prior to exporting the wax-up as an STL file to be 3D printed.

Results

The esthetic mock-up displayed a proper midline and occlusal plane clinically. The anatomic references provided by the SNAP scan proved key to this outcome. This method still relies on design of the digital wax-up by a skillful technician, therefore, the references must be carefully followed to achieve proper teeth placement.



Wax-up is transferred to the patient's dentition using a clear silicone matrix and bis-acryl provisional material. Final adjustments can be made intra-orally as needed.

Conclusions

Three-dimensional facial scanners, such as the DOF SNAP scanner, are innovative tools when digitally designing diagnostic wax-ups and help introduce reference planes in digital workspaces.

References

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