Self-Developed AI-Assisted Smartphone-Based Photogrammetry for Implant-Supported Complete-Arch Fixed Dental Prostheses (ISCFDPs)

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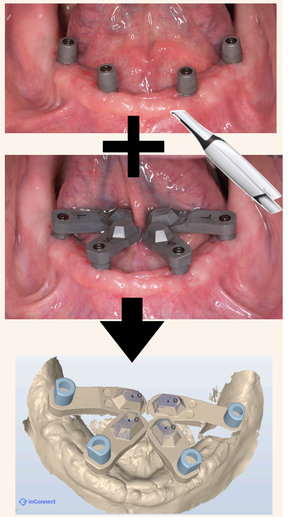
Full Arch implants impression technique

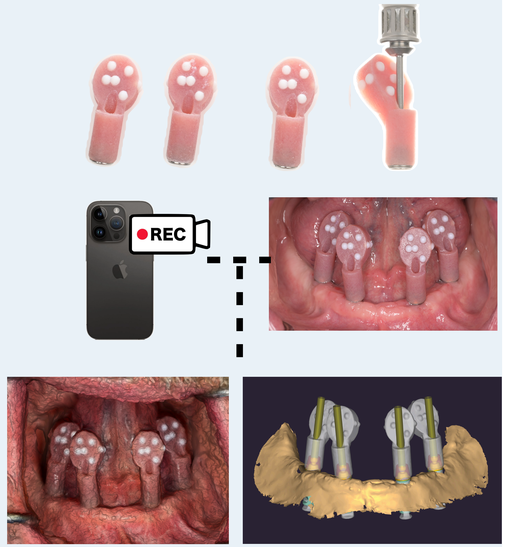
Open-tray splint impression

IOS-based photogrammetry



STL file with implants positions

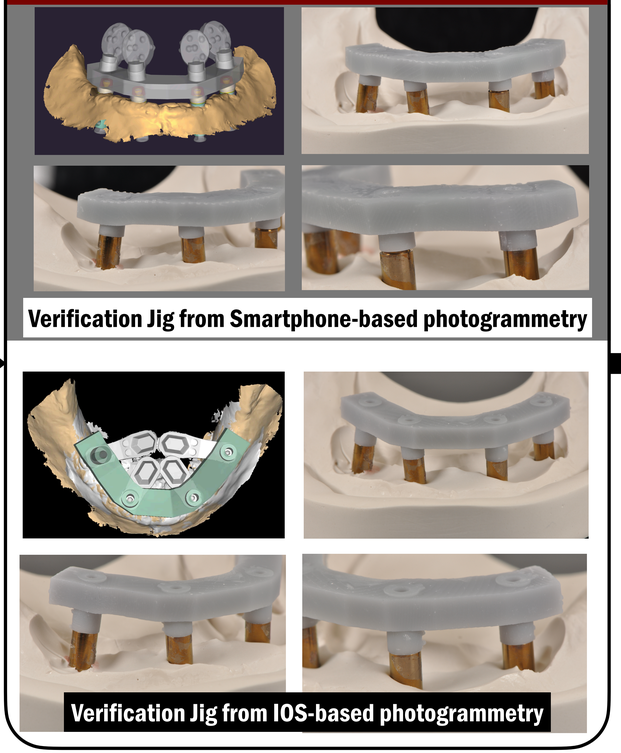
Self-developed AI-assisted smartphone-based photogrammetry



OBJ file from video

STL file with implants positions

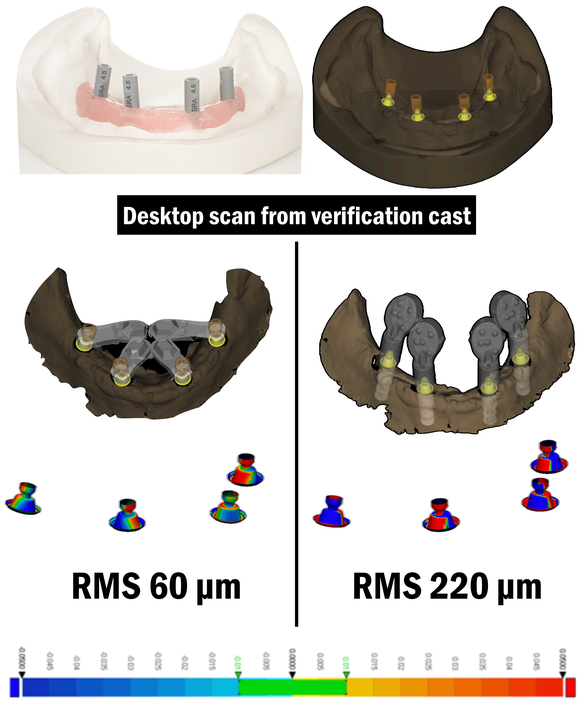
Physical analysis



Verification Jig from Smartphone-based photogrammetry

Verification Jig from IOS-based photogrammetry

Digital analysis



Desktop scan from verification cast

RMS 60 µm

RMS 220 µm

Discussion: Outcome

The commercial IOS-photogrammetry system demonstrated clinically acceptable accuracy, achieving an **RMS trueness of approximately 60 µm.** In comparison, the self-developed smartphone-based approach showed strong potential, with an **RMS trueness of about 220 µm** when compared to the gold-standard conventional impression. However, further refinement is needed to improve its precision. A possible limitation of the smartphone-based method may be attributed to the quality of video capture and the restricted intraoral access during recording. In several instances, incomplete visualization of scan bodies was observed, which negatively affected the matching process of the scanbodies in the CAD software.