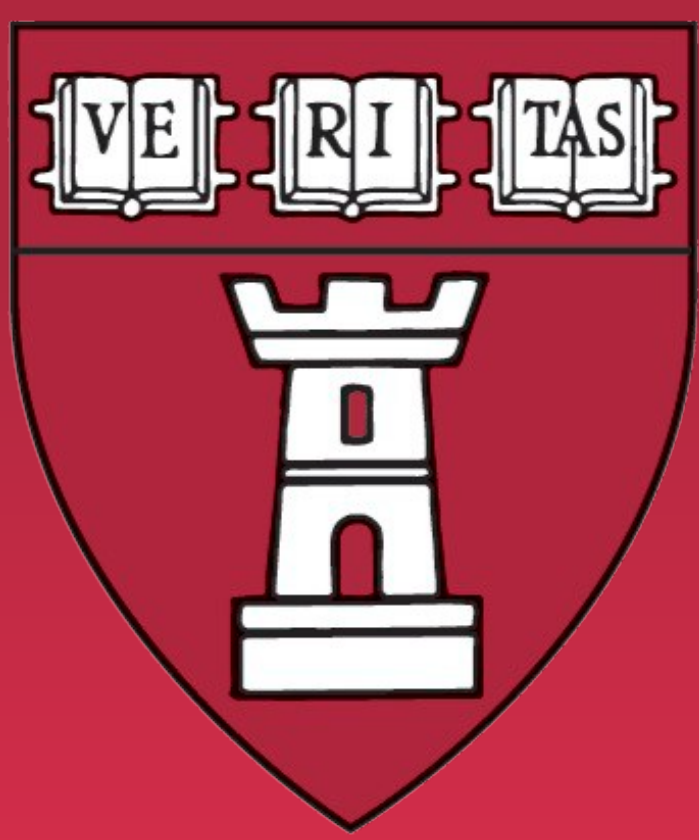


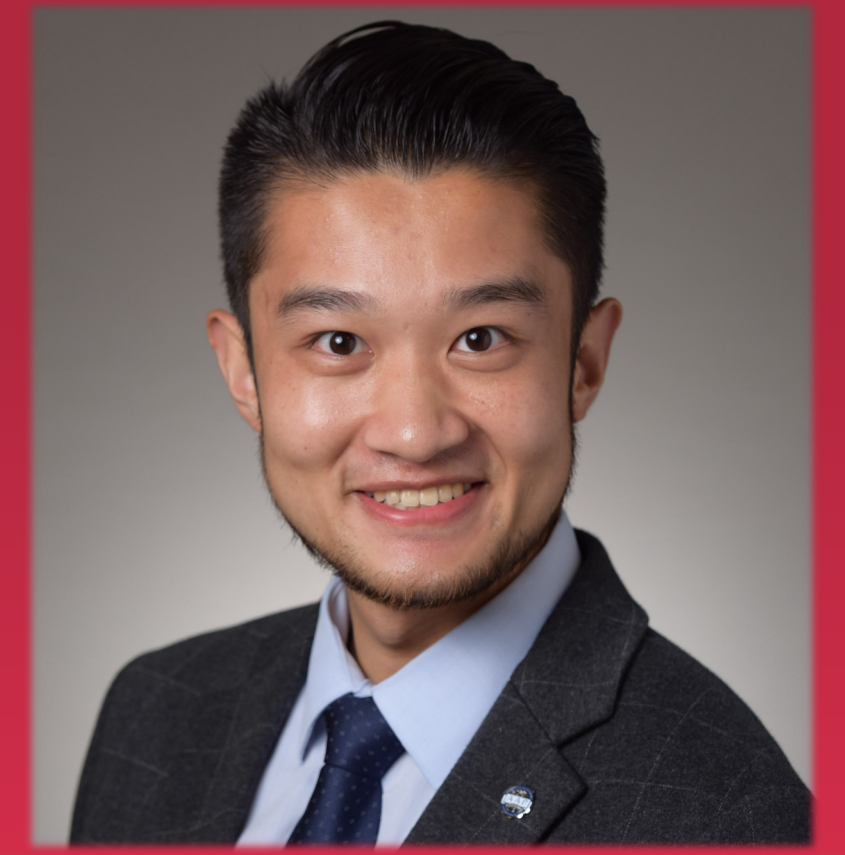


A Digital Approach to Immediately Loaded Full Arch Implant Dentistry

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CASE SYNOPSIS

This case report presents an improvement from traditional approaches whereby a full digital approach combining digital imaging, extraoral scanning, and CAD/CAM is used to deliver a same day temporization of full arch immediately loaded implants.

BACKGROUND

Conventional approaches to immediately loaded full-arch implant therapy require a verified master model created by luting together impression jigs. This process involves numerous steps and is prone to errors that require subsequent correction.

METHODS

A 72-year-old healthy female patient presents to clinic with a failing maxillary long-span fixed partial denture (FPD). After discussion of available treatment options, a same day temporization solution using dental implants was selected. Diagnostic records included smile photos, extraoral scan with photogrammetry, CBCT scan, and CAD/CAM of a temporary FPD was performed to be printed on the same day of surgery.

Neodent Gm dental implants were placed in a guided fashion using a surgical guide designed in an implant planning software. A palatal screw and the bilateral second molar implant crowns were used to maintain orientation of design relative to the temporary prosthesis design prior to the surgical placement of the implants. The implants achieved a minimum insertion torque of 35 Ncm each allowing for placement of the multi-unit abutments (MUA) and subsequent photogrammetry scan.

The palatal screw was removed during the wait time for 3D printing. The temporary was detached from the stacks and polished, inserted intraorally, hand tightened to the MUAs, occlusion was verified and adjusted accordingly. Final panoramic radiograph of seated temporary prosthesis is shown.

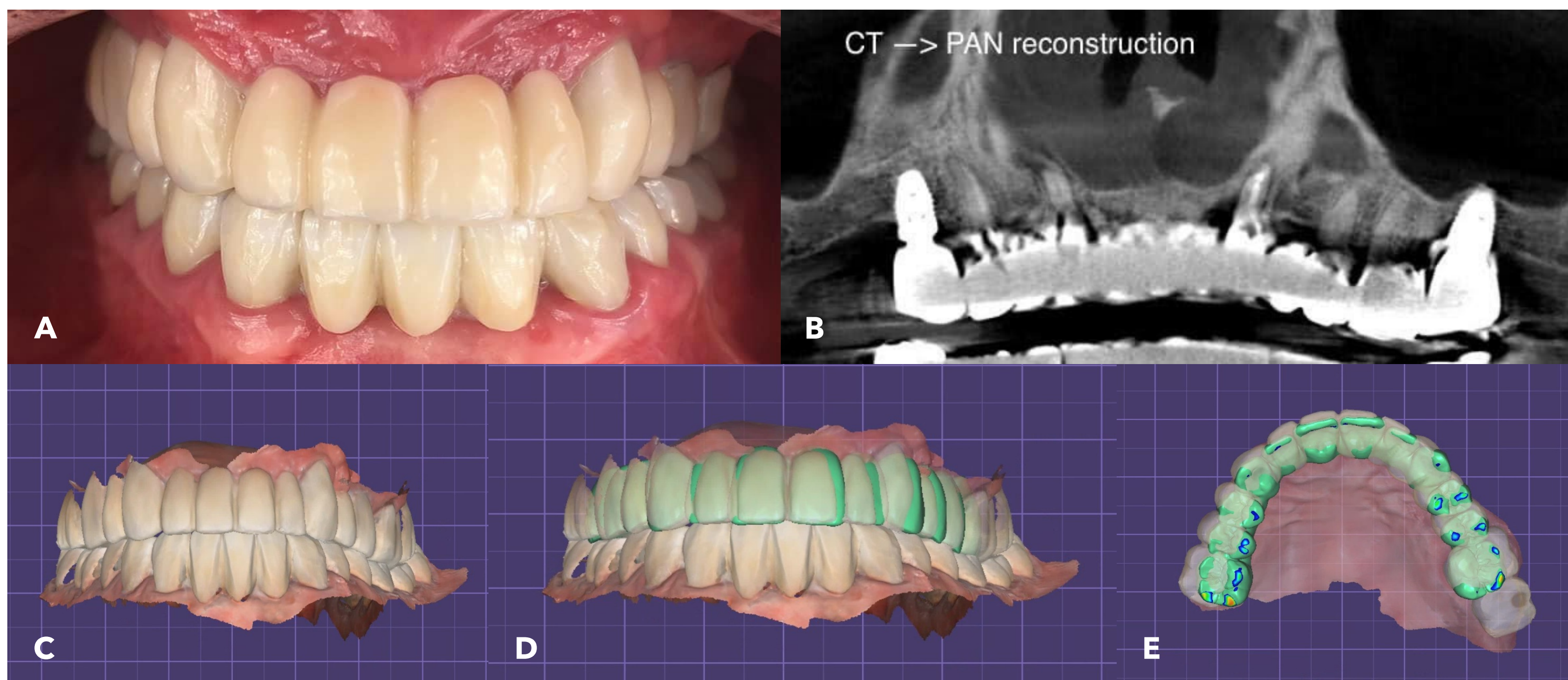


FIGURE 1. PRE-OP DIAGNOSTICS AND PLANNING

A) Initial patient presentation with a failing maxillary long-span fixed prosthesis. B) Panoramic radiograph of the patient as they presented with the failing maxillary long-span fixed prosthesis. C) Preoperative view of the patient's intraoral scan. D) Green highlighted areas illustrate the temporary design scan overlaid over the original scan. E) Occlusal view of the temporary design shown in green overlaid over the original scan.

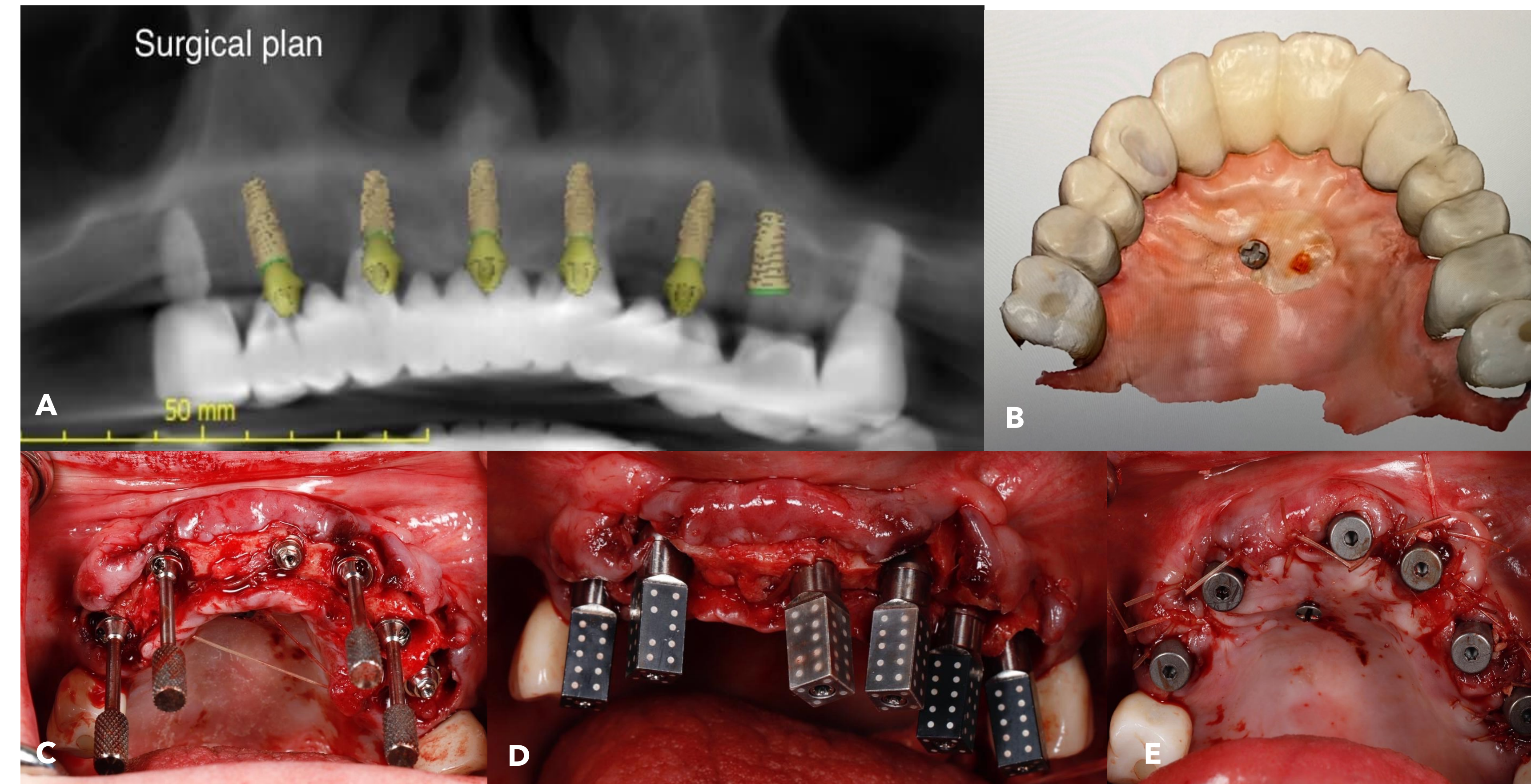


FIGURE 2. SURGICAL PLANNING AND WORKFLOW

A) Virtual surgical planning for the planned implant positions relative to the present anatomy. B) Intraoral scan of the patient with the pretreatment presentation with a palatal reference screw and the two posterior molars used as reference prior to surgical procedure initiation. C) Following implant placement MUAs are inserted on each implant to achieve parallelism and have a base to fixate the temporary screw retained prosthesis. D) Scan bodies are attached to the MUAs intraorally in preparation for scanning. E) Placement of healing abutments prior to soft tissue impression.

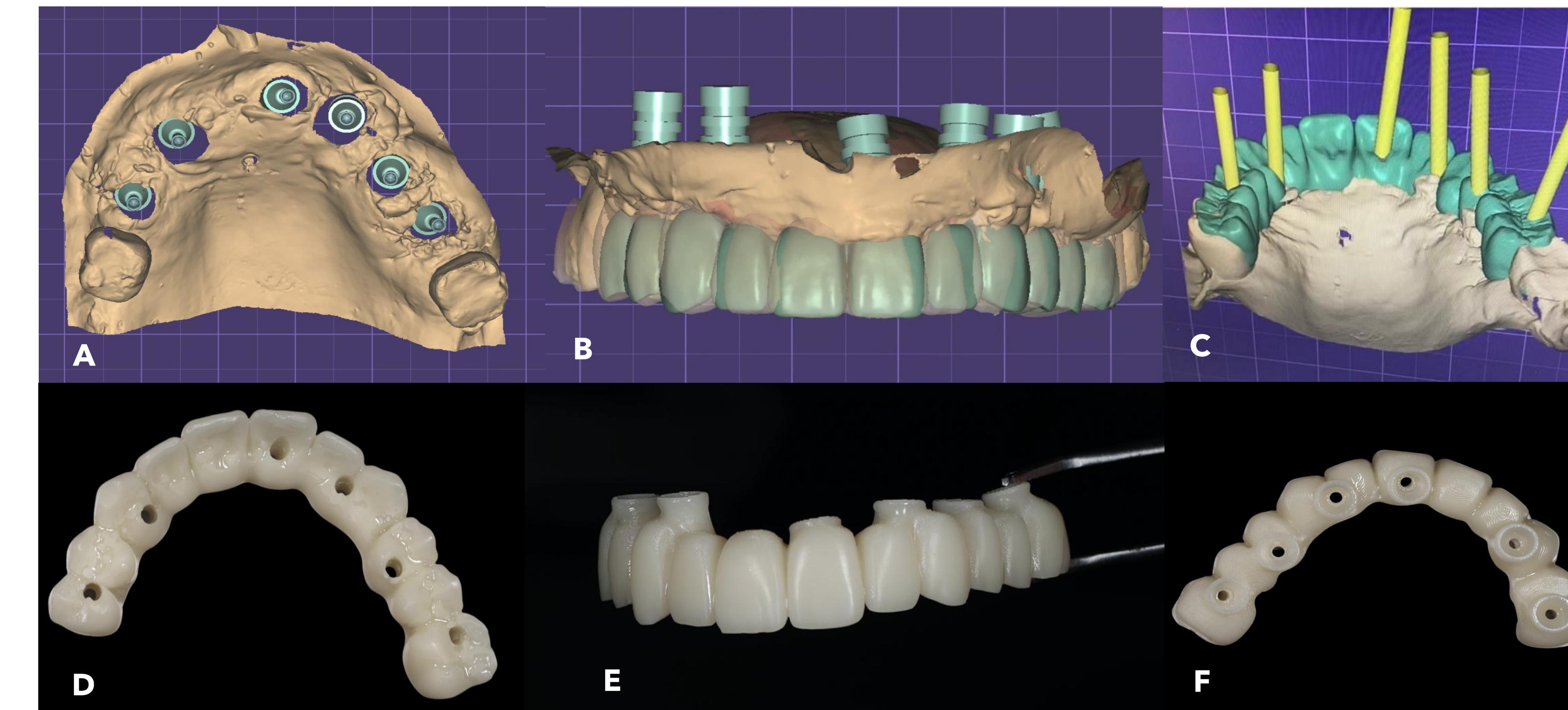


FIGURE 3. TEMPORARY PROSTHESIS DESIGN AND FABRICATION

A) Exocad design showing the captured implant positions on the MUAs. B) Temporary prosthesis design showing screw access holes relative to the prosthesis design. C) Exocad design to merge the virtual designed temporary prosthesis with the implant positions. D) The final printed temporary prosthesis following removal of the supports and polishing ready for intraoral insert. E) Frontal view of the temporary prosthesis prior to insertion intraorally. F) Intaglio (tissue side) view of the temporary prosthesis prior to insertion intraorally.

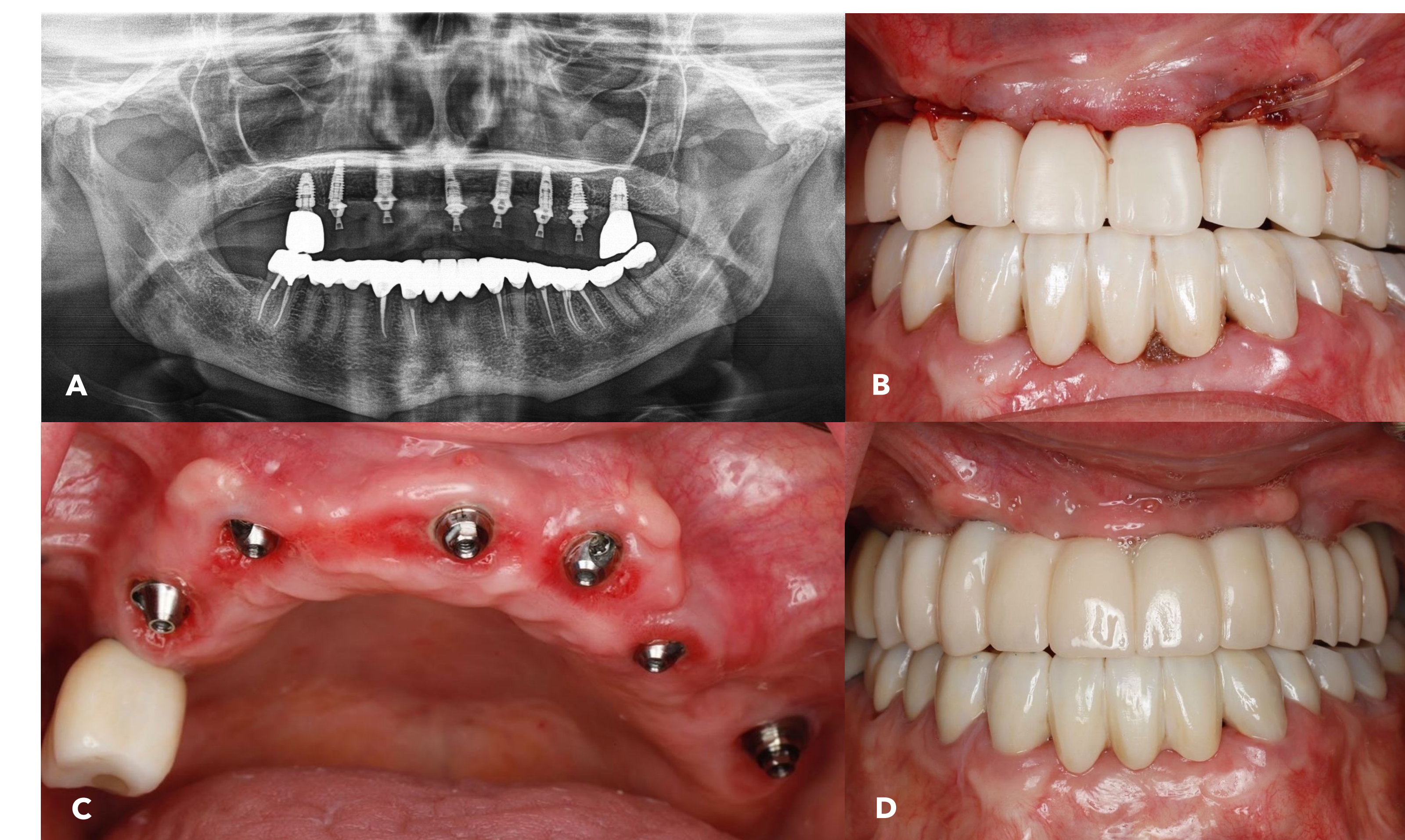


FIGURE 4. POST-OP RESULTS

A) The printed maxillary immediate temporary prosthesis following intraoral insertion. B) The panoramic radiograph of the temporary prosthesis following intraoral insertion. C) 6 months post-op evaluation following implant osseointegration. D) The maxillary final prosthesis following intraoral insertion.

RESULTS

This case report shows that this novel digital approach offers a same day temporization option without the need for a verification jig or corrected cast. This digital workflow reduces chair time, shortens lab processing time, ensures the passivity of the temporary prosthesis, and improves patient comfort by reducing patient nausea associated with physical impressions.

CONCLUSION

The clinical application of a novel photogrammetry system for registering the positions of multiple implants at the time of surgery allows for rehabilitation of the patient using a same day delivery of a 3D printed prosthesis. As the cost of digital dentistry becomes more accessible for clinicians, more patients can be treated with fewer clinical visits.



CONTACT INFORMATION

