



Introduction

Psoriasis is a common, chronic, immune-mediated, systemic inflammatory disease that primarily affects the skin and joints. The **prevalence** of psoriasis in the US is **3%**, which correlates to approximately 7.5 million American adults, affecting males and females equally. Full-mouth and esthetic implant rehabilitation is challenging in partially dentate patients diagnosed with psoriasis. **Plaque psoriasis is the most common type, characterized by thick, red patches and silver white scales.** Studies have shown that **immune dysregulation** in patients with psoriasis can result in increased risk of **severe periodontal disease** and higher prevalence of **fissured and geographic tongue**. **Prosthodontic management** involves utilizing **innovative digital technologies** to **shorten appointment times** and **limit the number of appointments** to reduce the risk of flare-ups. This clinical case describes an interdisciplinary, complete digital workflow in the prosthodontic management of a psoriasis patient.

Case Presentation

A 69-year-old male patient diagnosed with **psoriasis** presented to the Department of Prosthodontics with an edentulous maxilla and partially edentulous mandible. The patient was seeking comprehensive treatment to **improve esthetics** and **masticatory function** (fig 1 and 2).

Following clinical examination, the **final prosthetic plan** was designed as follows:

- *Fixed complete arch implant prosthesis for the maxilla.*
- *Extraction of hopeless mandibular incisors and crowns for remaining teeth*
- *Two implant-assisted removable partial denture (RPD)*

Digital Technology was used to complete surgical and prosthetic treatment plans in three phases:
Phase 1: *3D cone-beam computed tomography (CBCT)*, intra-oral scans, *digital smile design* and *digital planning software* were utilized for a prosthetically-driven implant plan (figs. 3 and 4).
Phase 2: A *mucosa-supported guide* was designed and *3D-printed* to complete the maxillary implant osteotomies. A *tooth-supported surgical guide* was also fabricated for mandibular implants followed by extraction of anterior mandibular teeth (figs 3, 4, 5).

Initial presentation and Surgical Phase



Fig. 1: Initial visit. Patient presents with plaque psoriasis characterized by thick, red patches and silver-white scales.



Fig. 2. Initial intraoral presentation. Edentulous maxilla and partially edentulous mandible.

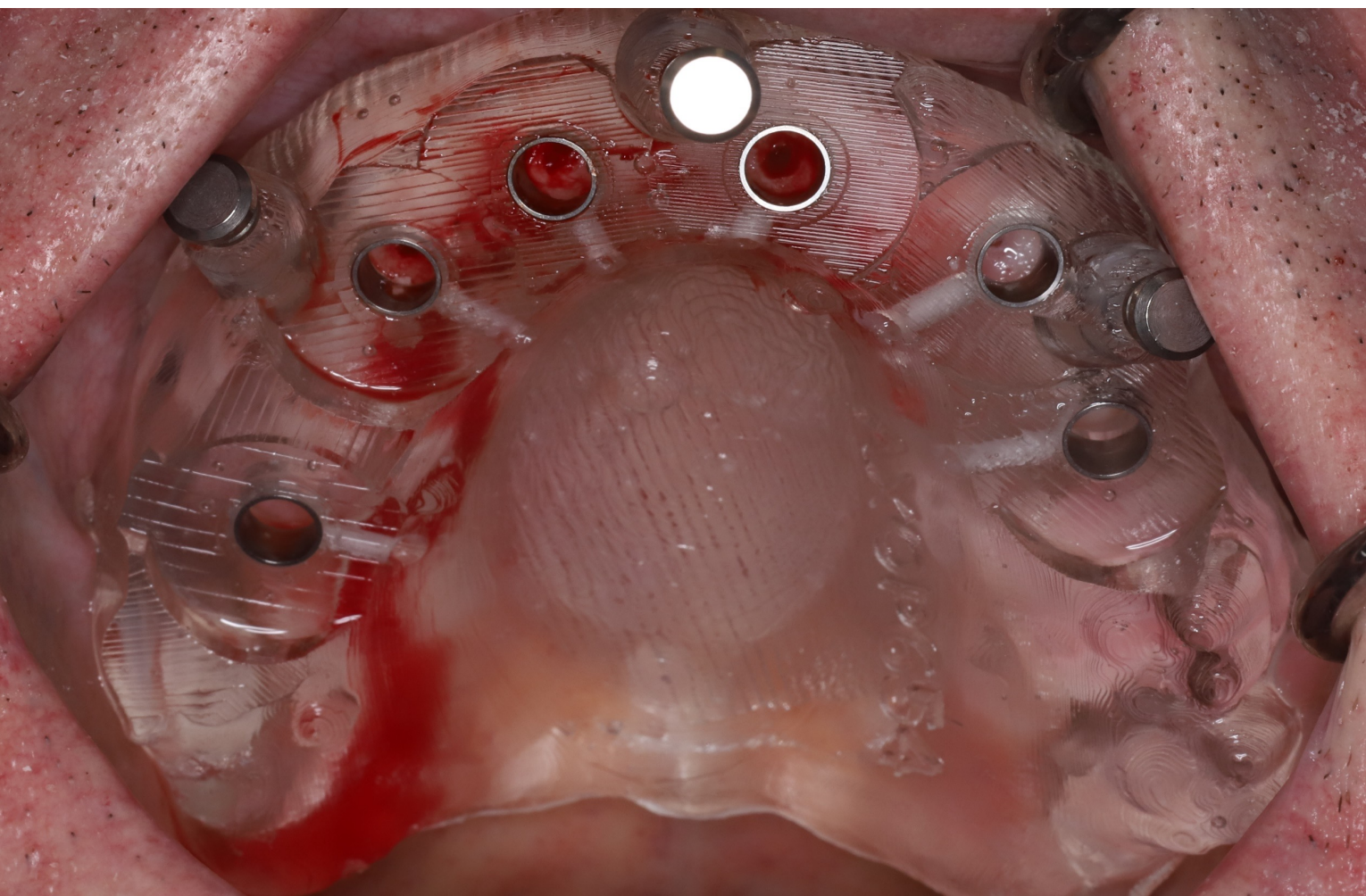


Fig. 3. Maxillary tissue-supported 3D-printed surgical guide.

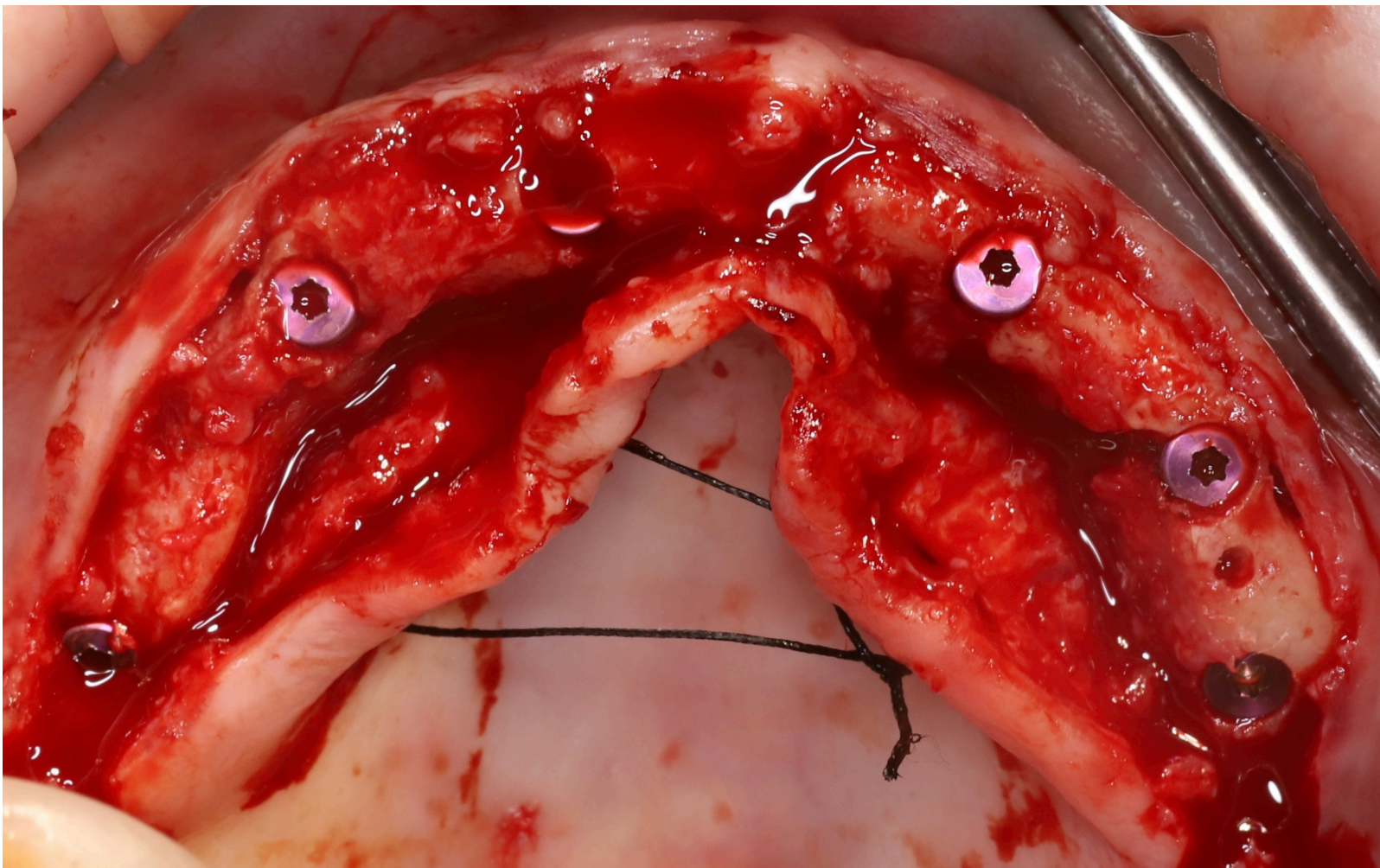


Fig. 4. Final implants position of maxillary implants.

Prosthetic Phase: Photogrammetry and Esthetic Rehabilitation



Fig. 5. Panoramic x-ray depicting final maxillary and mandibular implants during the healing phase.



Fig. 6. Soft tissue record was obtained with MUA healing caps using an intraoral scanner.



Fig. 7. Scan bodies (ICAM Body) screwed onto the multiunit abutments. Scan bodies are positioned allow maximum visualization of targets.



Fig. 8. Interim implant fixed prosthesis used to assess esthetics, phonetics, midline, overjet and overbite.

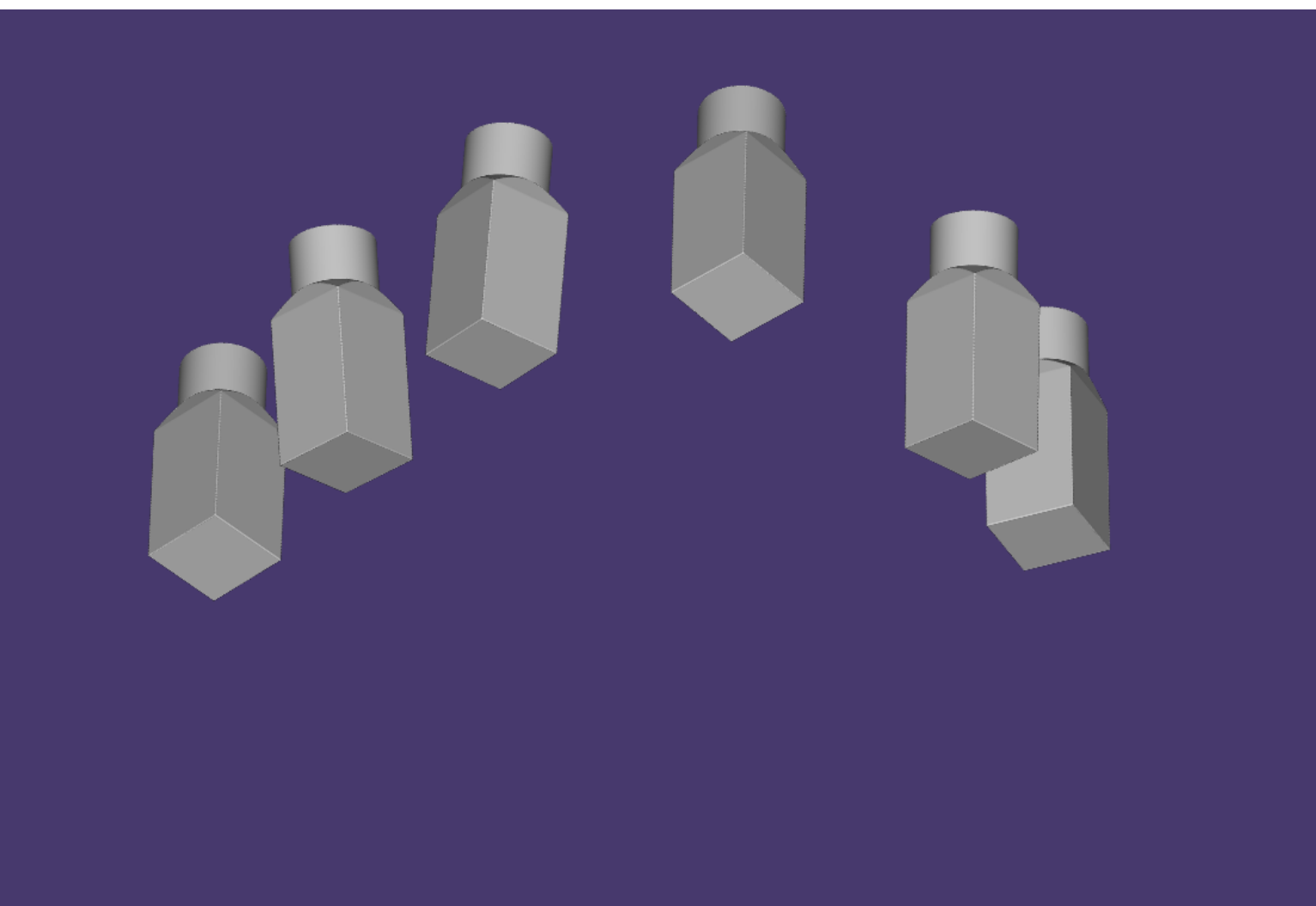


Fig. 8. Verification of implant registration using designated software. Scan bodies are highlighted once implant positions are obtained.

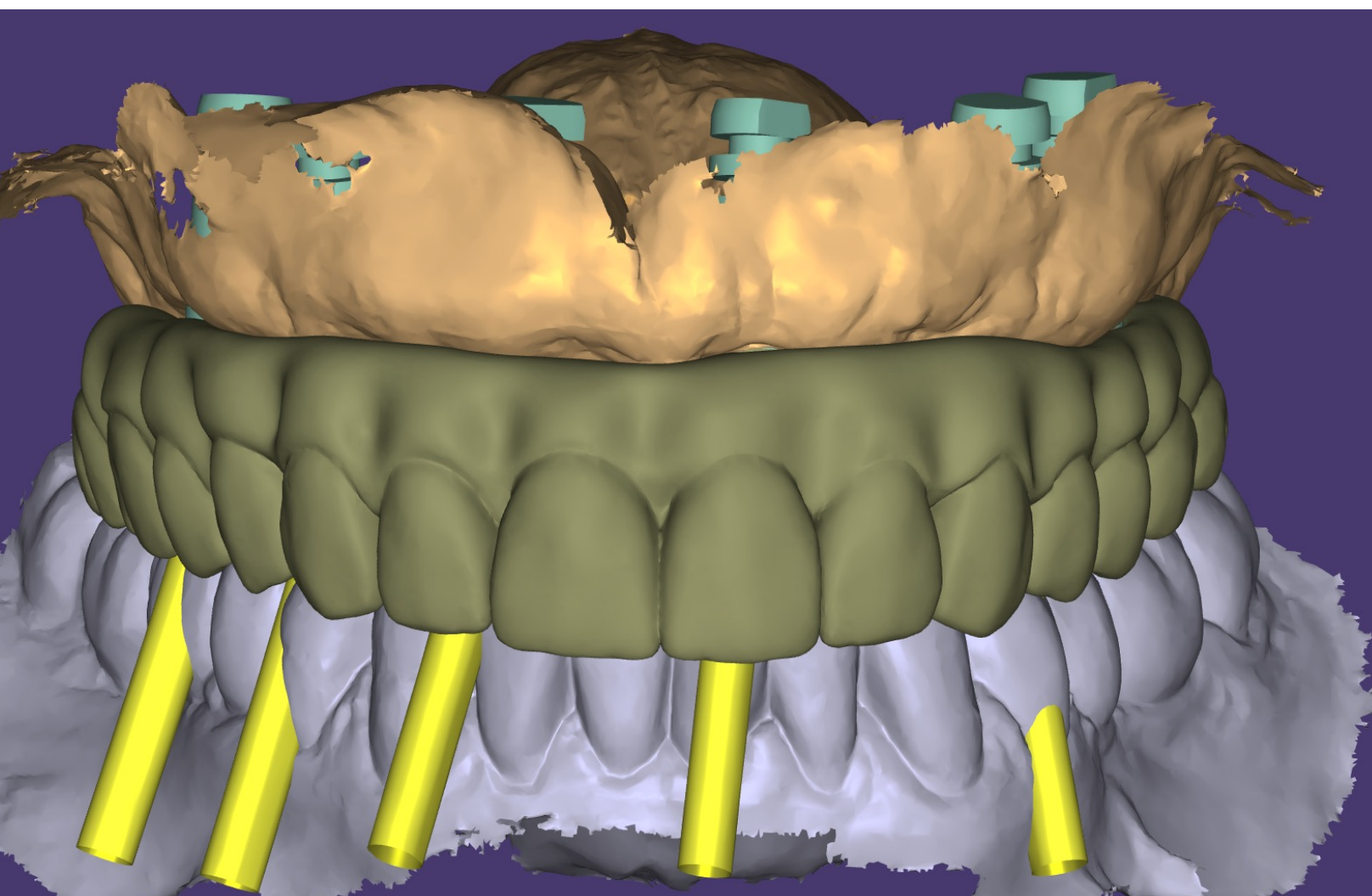


Fig 10. ExoCAD digital software was used in designing abutments and final prostheses.

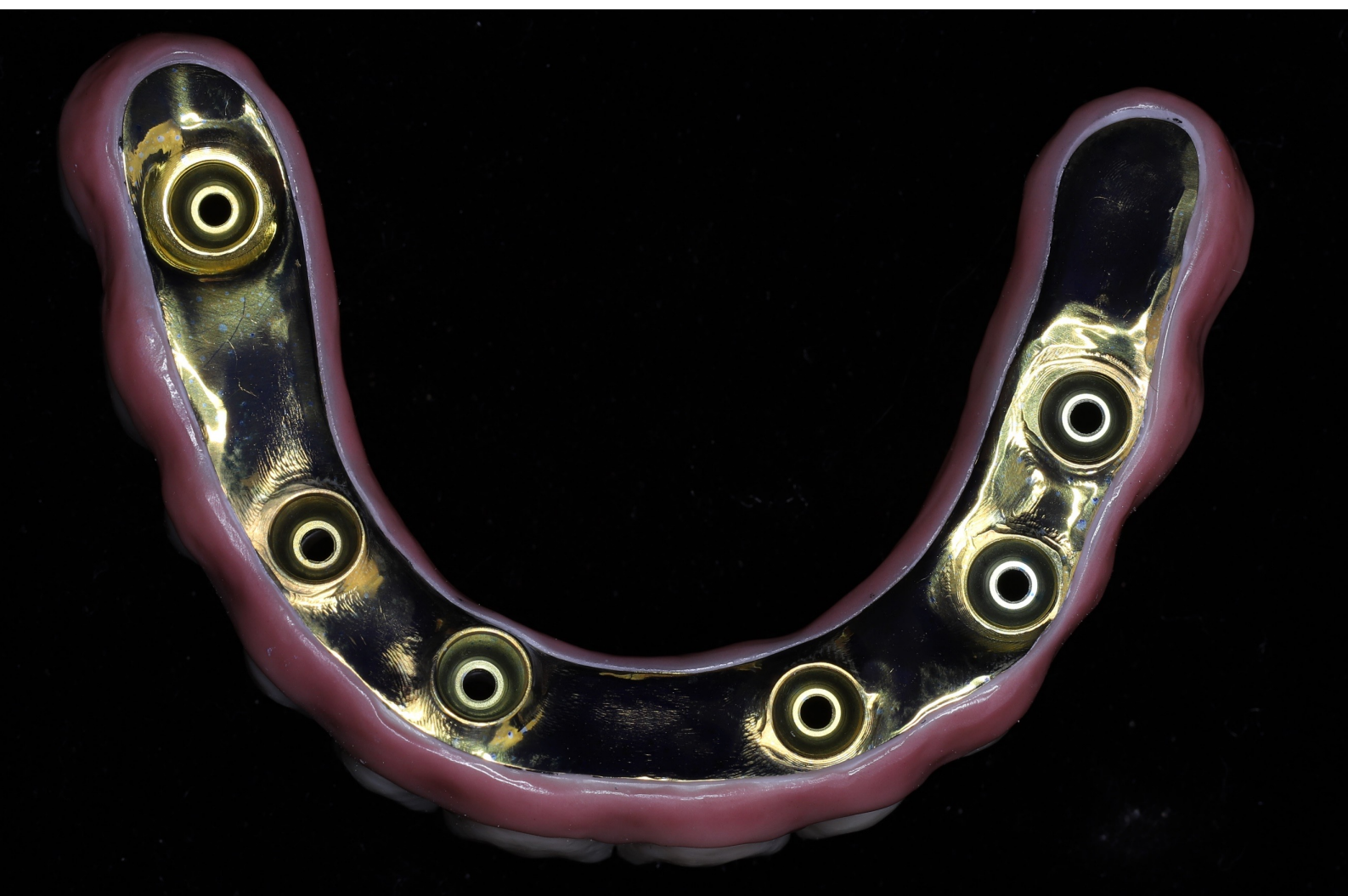


Fig 11. Final milled-zirconia, implant-supported fixed prosthesis with titanium substructure for the edentulous maxilla.



Fig. 12. Full frontal view showing final esthetic and functional rehabilitation.

Phase 3: *Photogrammetry technology* was used to digitize final implant positions. Digital intra-oral scans and digital software were used for design and fabrication of lower crowns.

Photogrammetry in Full-arch Implant Rehabilitation

Photogrammetry is a **novel digital impression** technique that utilizes an extraoral device to **capture the precise intra-oral positions of multiple implants in full arch cases**. This technique utilizes **photographic images** to determine the **geometrical properties** and **spatial arrangement** of objects.
Step 1: Pre-operative digital scans of the wax try-in were obtained to record the new vertical dimension and incisal position using Trios 5 scanner.
Step 2 (fig 6): **Soft tissue record** was obtained with MUA healing caps using an intraoral scanner. Intraoral scan bodies were used to scan lower crown preparations
Step 3 (fig 7-9): **Scan bodies** (ICamBody; Imetric 4D) were positioned and hand tightened on each implant, and an ICam 4D extraoral camera was used to digitize position of the implants.

Prostheses Fabrication:

CAD/CAM software was used to design and fabricate a **maxillary full-arch PMMA prototype and lower survey crowns**. Prototype was delivered at the new VDO and used to assess esthetics, phonetics, midline, overjet and overbite. Final **esthetic rehabilitation** was accomplished with a **full-arch implant-supported fixed prosthesis with titanium substructure** for the edentulous maxilla, **monolithic zirconia survey crowns** and an **implant-assisted removable partial denture (RPD)** (figs 9-11).

Conclusion

The incorporation of innovative digital technology facilitates planning and execution of full mouth rehabilitation in patients at risk of **peri-oral psoriasis** and **limited mouth opening**. These modalities allow for shortening of appointment time and simplification of clinical and lab steps, while providing high patient satisfaction.

