

Prosthetically Driven Full-Arch Rehabilitation of an Edentulous Patient Using a Combined FP1–FP3

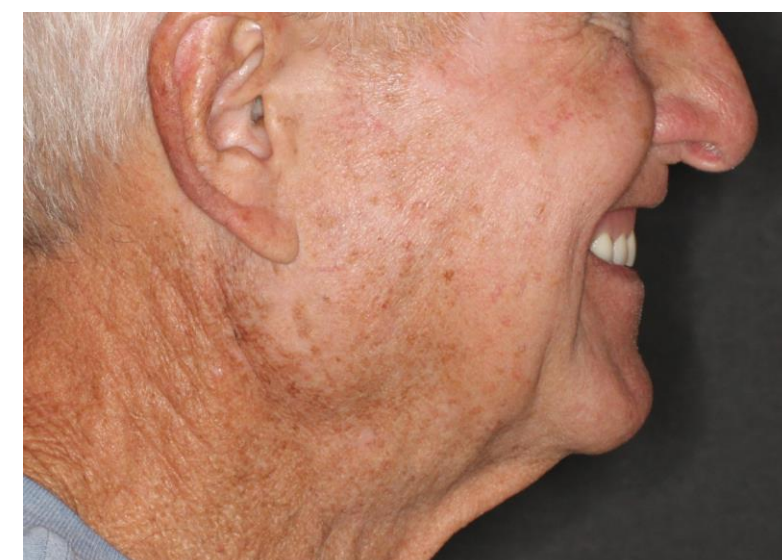
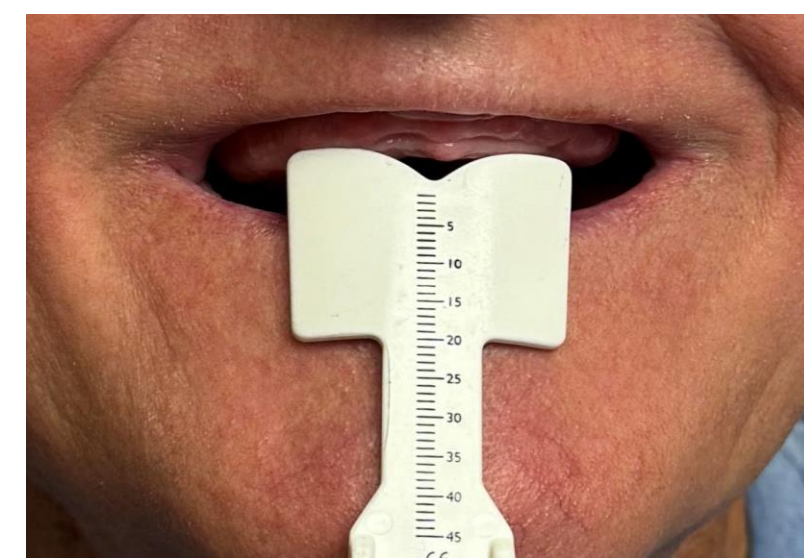
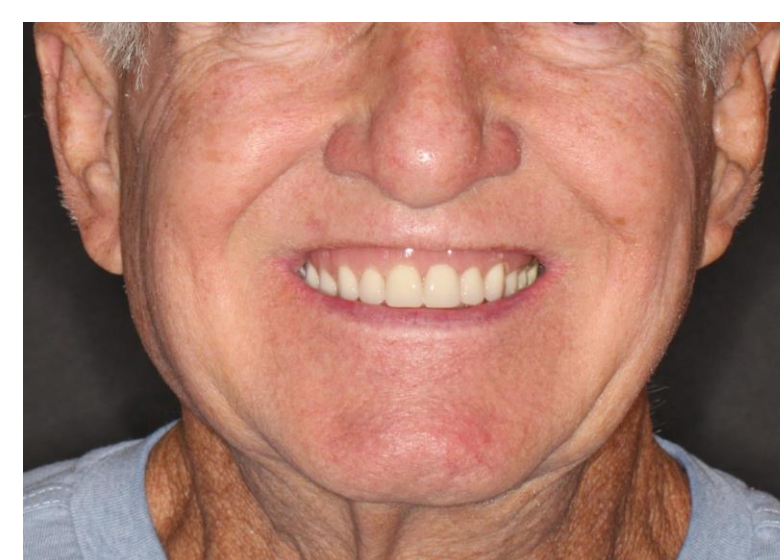
Approach: A Two-Stage Surgical Protocol with Mucosa-Supported Guided Implant

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INTRODUCTION:

- Full-arch implant rehabilitation in edentulous patients requires comprehensive evaluation of **aesthetic, functional, and anatomic factors**.
- The choice between **FP1, FP2, or FP3 prosthesis types** depends on:
 - i. Available restorative space
 - ii. Smile line
 - iii. Soft tissue display
 - iv. Transition zone management
- **Inadequate planning** may cause:
 - i. Unnecessary bone reduction
 - ii. Esthetic compromise
 - iii. Functional failure
- This case demonstrates a **prosthetically driven approach** that **preserved bone**, enhanced restorative outcomes by utilizing **combined FP1–FP3 strategy**.



CASE DESCRIPTION:

Patient Profile

- 70-year-old male
- Complete edentulism
- Medical history: controlled diabetes and hypertension

Clinical & Radiographic Findings

- Reduced restorative space: **10 mm**
- High smile line with **significant gingival display**
- Diagnosis: **vertical maxillary excess**

Initial Treatment Plan

- FP3 prostheses planned for both arches
- Required bone reduction:
 - i. 10–12 mm in maxilla
 - ii. 5–6 mm in mandible
- Risks: esthetic compromise and biologic concerns

Revised Treatment Plan

- **Maxillary FP1 prosthesis** to preserve hard tissues
- **Mandibular FP3 prosthesis** for function
- Strategy: conserve bone and achieve harmony between esthetics and biology

METHODS:

Prosthetic Try-Ins & Analysis:

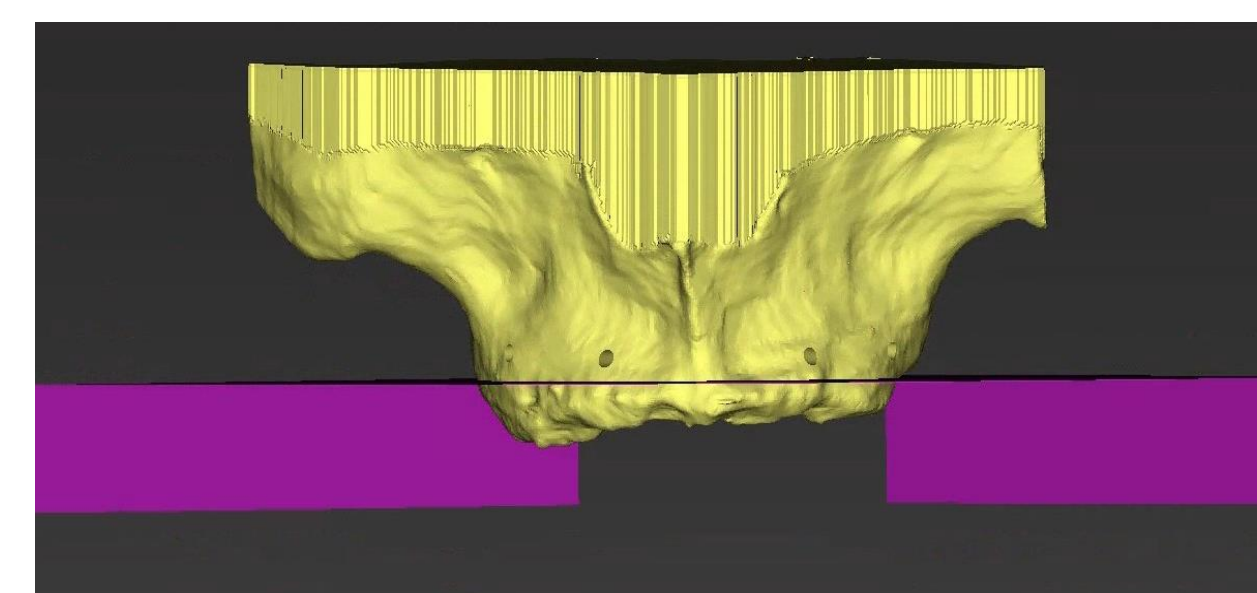
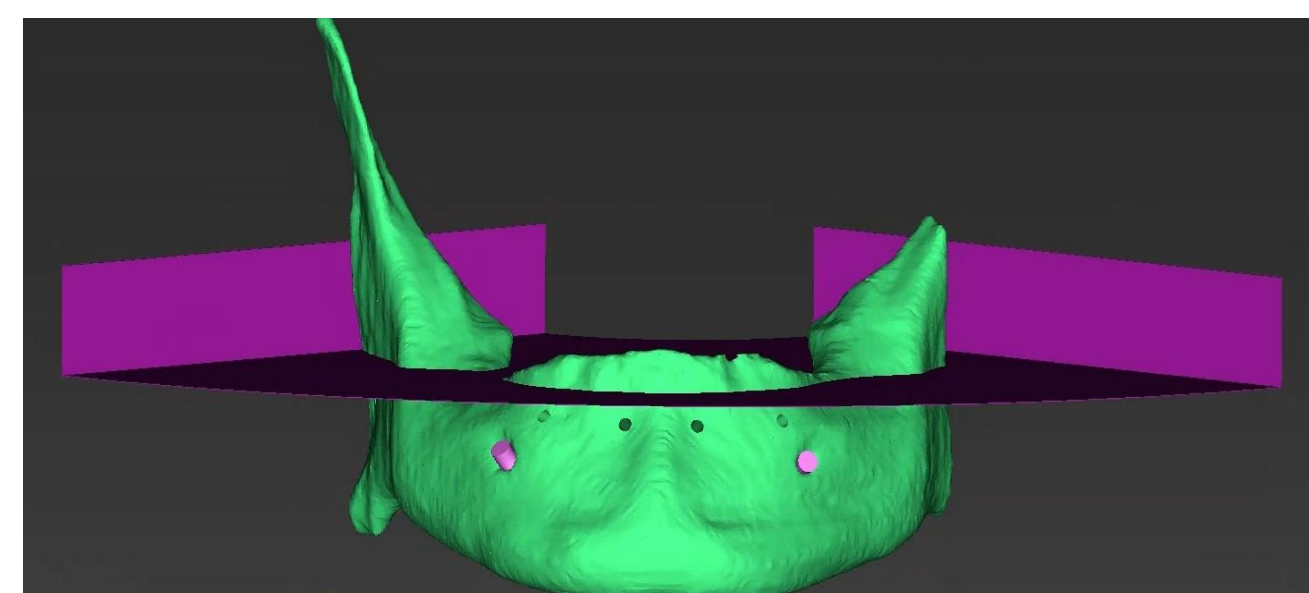
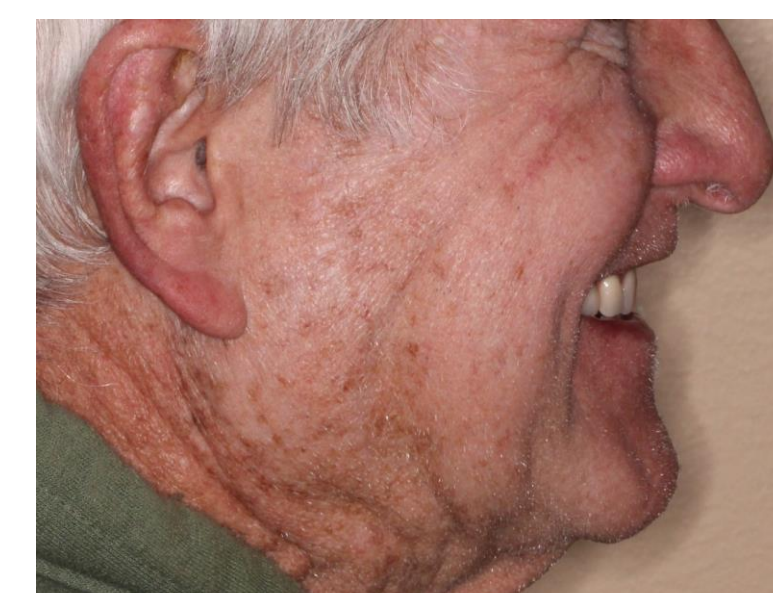
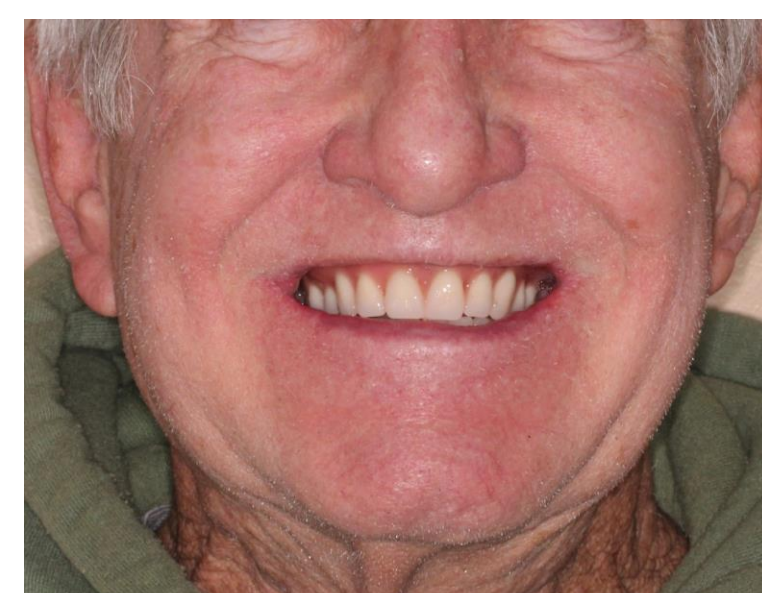
- Two analog try-ins performed to refine prosthetic plan
- First try-in with dual scan showed **9 mm prosthetic space** between maxilla and mandible

Revised Prosthetic Plan

- **Maxilla:** Modified to **FP1 prosthesis** for esthetic and biologic preservation
- **Mandible:** Retained as **FP3 prosthesis** for functional needs

Implications for FP3 Prosthesis:

- FP3 design in both arches would require:
- **10–12 mm bone reduction** in the maxilla
- **5–6 mm bone reduction** in the mandible
- Risk: excessive reduction → esthetic and biological compromise



Phase 1: Ridge Preparation & Planning:

Conservative alveolectomy performed using stackable guides

Bone reduction:

- **5–6 mm** in maxilla
- **4–5 mm** in mandible

Goal: optimize ridge contours for implant placement

After healing:

- Additional try-ins completed
- Revised dual scan confirmed restorative space
- Finalized implant planning

Phase 2: Guided Implant Placement & Immediate Loading:

Implants placed using **mucosa-supported static surgical guides**

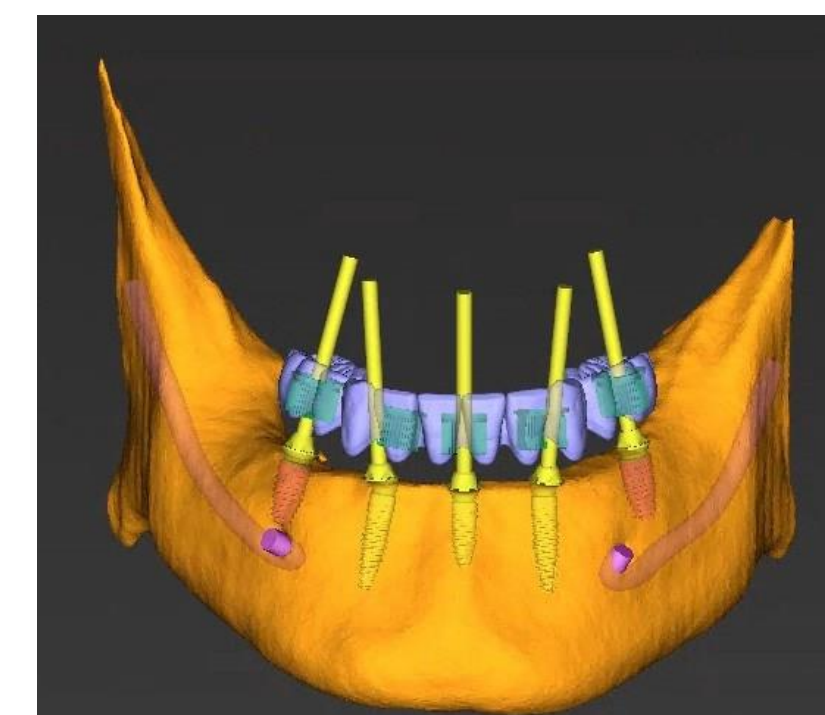
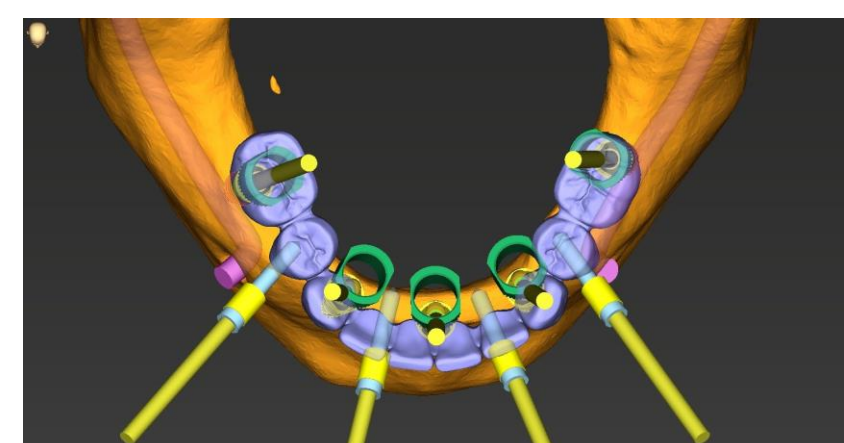
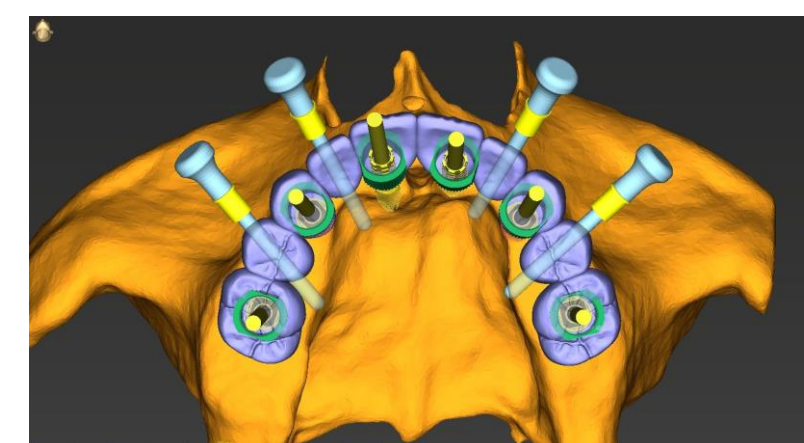
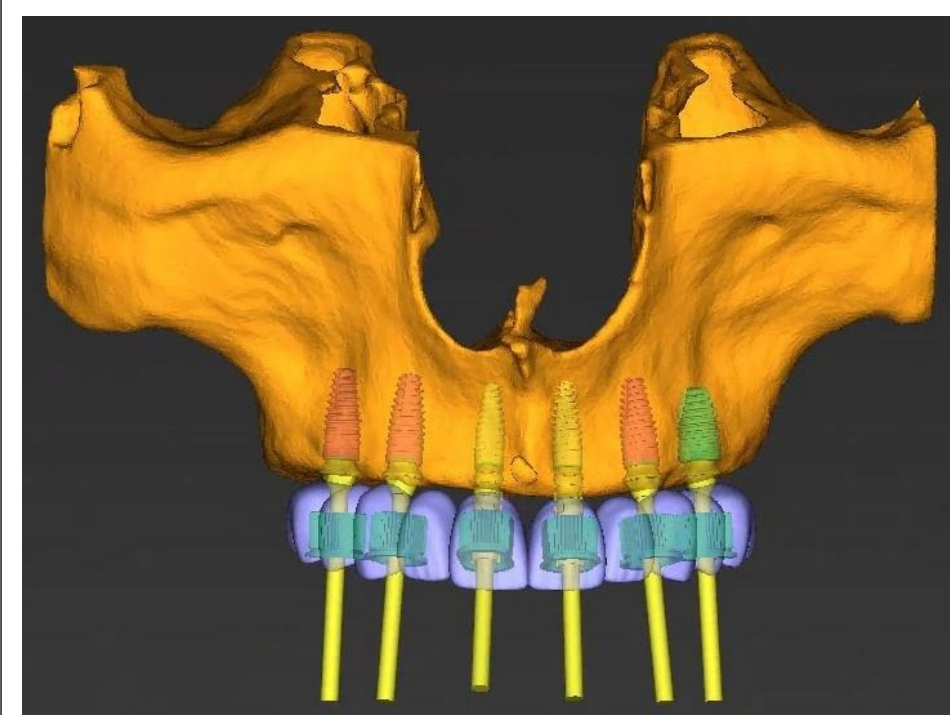
Implant distribution:

- Six implants in maxilla
- Five implants in mandible

All implants achieved **>25 Ncm primary stability**

Immediate loading protocol:

- 3D-printed conversion prostheses delivered
- Prostheses secured on **multi-unit abutments**
- Occlusion refined to **implant-protected scheme**



RESULTS:

Advantages of Revised Plan

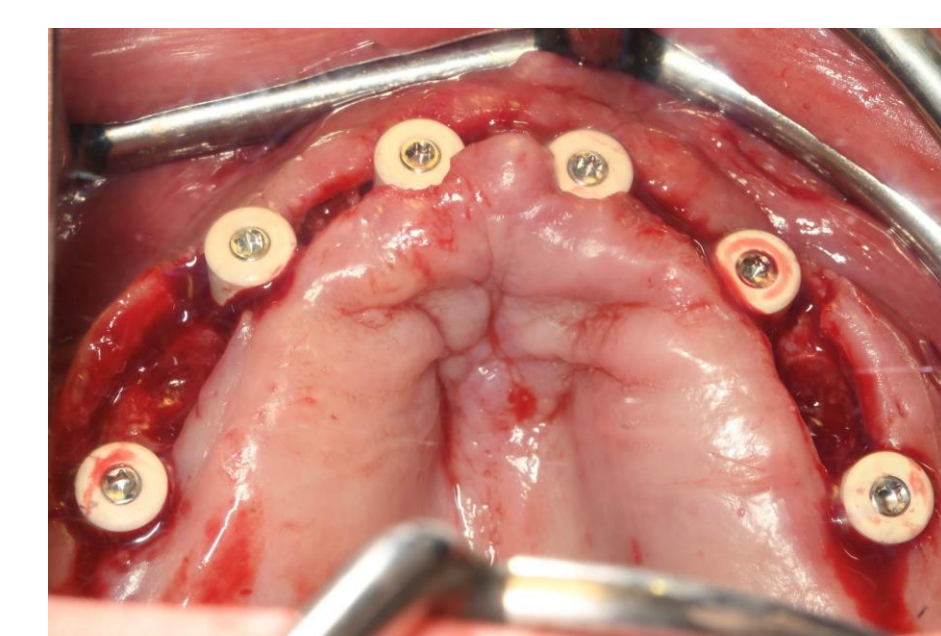
- Avoided unnecessary bone reduction
- Preserved key esthetic parameters
- Established a stable and harmonious **transition zone**

Surgical & Prosthetic Benefits

- Guided surgery improved **precision** and reduced morbidity
- Enabled **immediate functional loading** with predictable stability

Patient Outcomes

- Reported high **comfort** and **esthetic satisfaction**
- Improved oral **function**
- **No early complications** observed during healing phase



DISCUSSION & CONCLUSION:

- Emphasizes the importance of **prosthetically driven, individualized planning** in full-arch rehabilitation.
- **FP1 prosthesis in maxilla** preserved bone and achieved natural esthetics.
- **Guided protocols** ensured accurate implant placement and predictable immediate loading.
- Outcomes align with evidence stressing evaluation of **anatomy, smile line, and restorative space** before selecting FP3.
- **Bone preservation** and **transition zone control** are critical for long-term success and patient satisfaction.

KEY TAKEAWAYS

- **Prosthetically driven planning** prevents unnecessary bone removal and optimizes long-term outcomes.
- **FP1 prosthesis in the maxilla** preserves bone and provides superior esthetic results compared to FP3.
- **Guided implant surgery** improves precision, reduces morbidity, and enables predictable immediate loading.
- **Transition zone management** is essential for esthetics, function, and overall patient satisfaction in full-arch rehabilitation.

REFERENCES:

- Auduc C, Douillard T, Nicolas E, El Osta N. Fully digital workflow in full-arch implant rehabilitation: a descriptive methodological review. *Prosthesis*. 2025;7(4):85.
- Khaohoen A, Powcharoen W, Sornsuwan T, et al. Accuracy of implant placement with computer-aided static, dynamic, and robot-assisted surgery: a systematic review and meta-analysis of clinical trials. *BMC Oral Health*. 2024;24:359.
- Azevedo M, et al. Accuracy of implant guided surgery in fully edentulous patients. *J Clin Med*. 2024;13(17):5178.
- Nulty A. A literature review on prosthodontically designed guided implant placement and the factors influencing dental implant success. *Br Dent J*. 2024;236:169-180.
- Froimovici FO, et al. Fixed full-arch implant-supported restorations: options, considerations, & complications. *J Prosthodont*. 2024.