

# From Bone to Beauty: AI-Enhanced, ZAGA-Guided Workflow for Biologically and Prosthetically Optimized Full-Arch Zygomatic Rehabilitation

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## Introduction

- Rehabilitation of the **severely atrophic maxilla** remains one of the most complex problems in implant dentistry.
- Post-extraction bone loss leads to posterior and sinus-adjacent resorption

## Limitations of Conventional Solutions

- Sinus augmentation and onlay grafting may be effective, but are associated with:
  - Prolonged treatment time
  - Increased morbidity
  - High dependence on surgical proficiency

## Patient Presentation

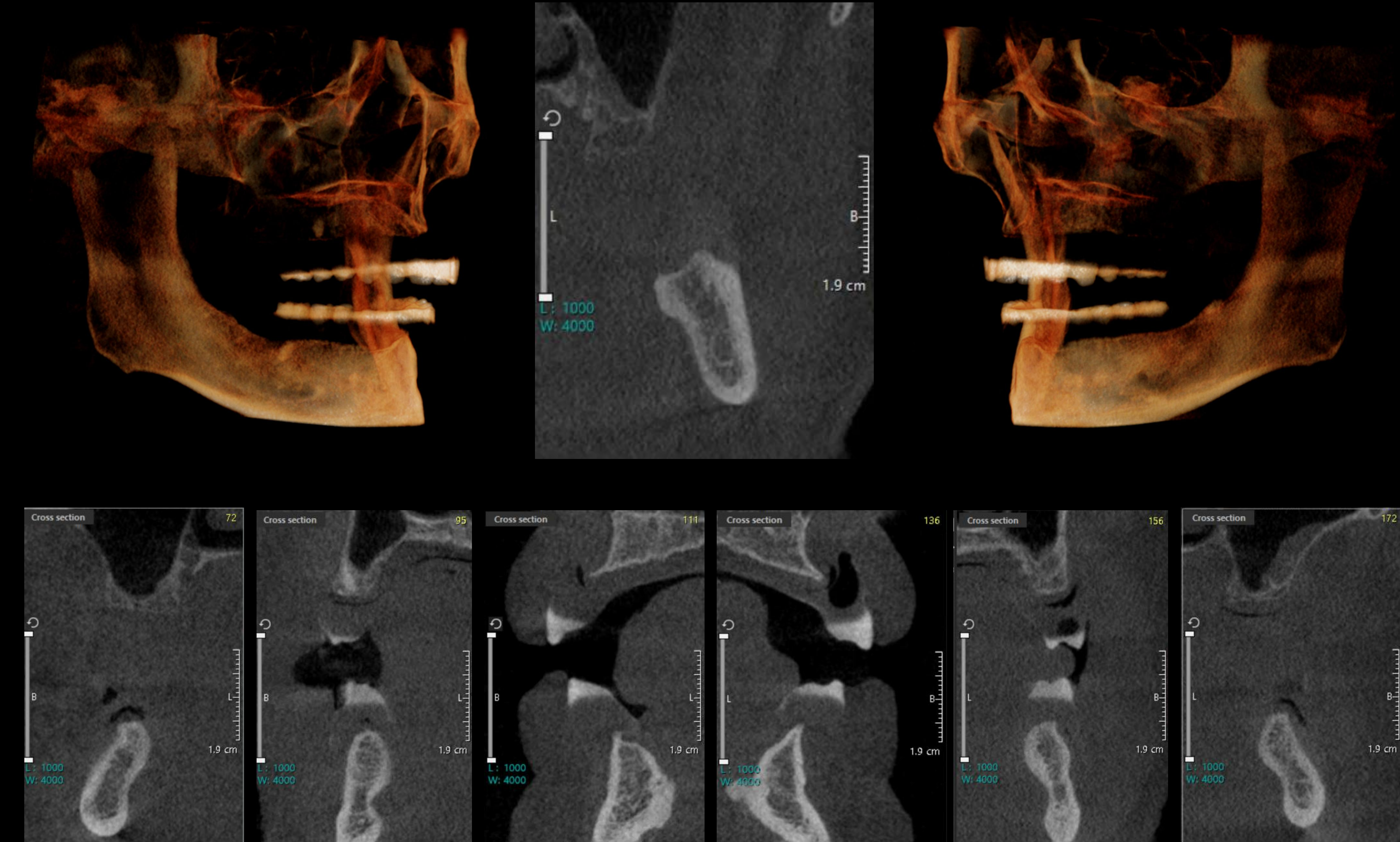
*CC: "I need something that won't cause me to gag and will allow me to smile again. I'm also afraid of undergoing multiple surgeries to get there!"*



## Rationale

- **Zygoma Anatomy-Guided Approach (ZAGA)** enables patient-specific implant trajectories.
- However, **soft-tissue complications** and **prosthetically compromised** outcomes remain concerns
- Conventional planning prioritizes **bone availability** over **prosthetic design**
- Artificial intelligence may *enhance* anatomic visualization and prosthetic predictability in treatment planning
- An emphasis on ZAGA-guided digital planning may prevent compromised outcomes

## Radiographic Examination



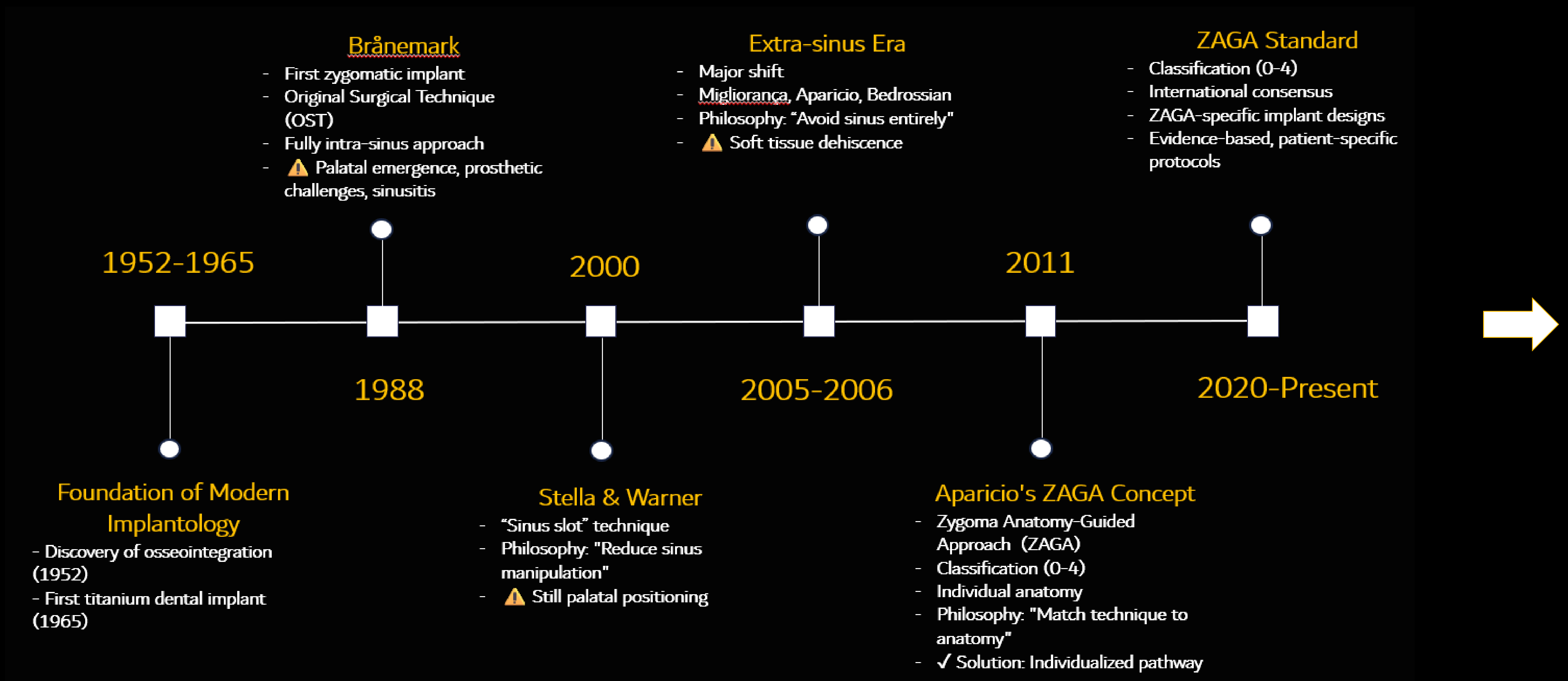
## Purpose

To present an *AI-enhanced, ZAGA-guided* digital workflow that integrates biologic principles with prosthetically driven planning for full-arch zygomatic rehabilitation

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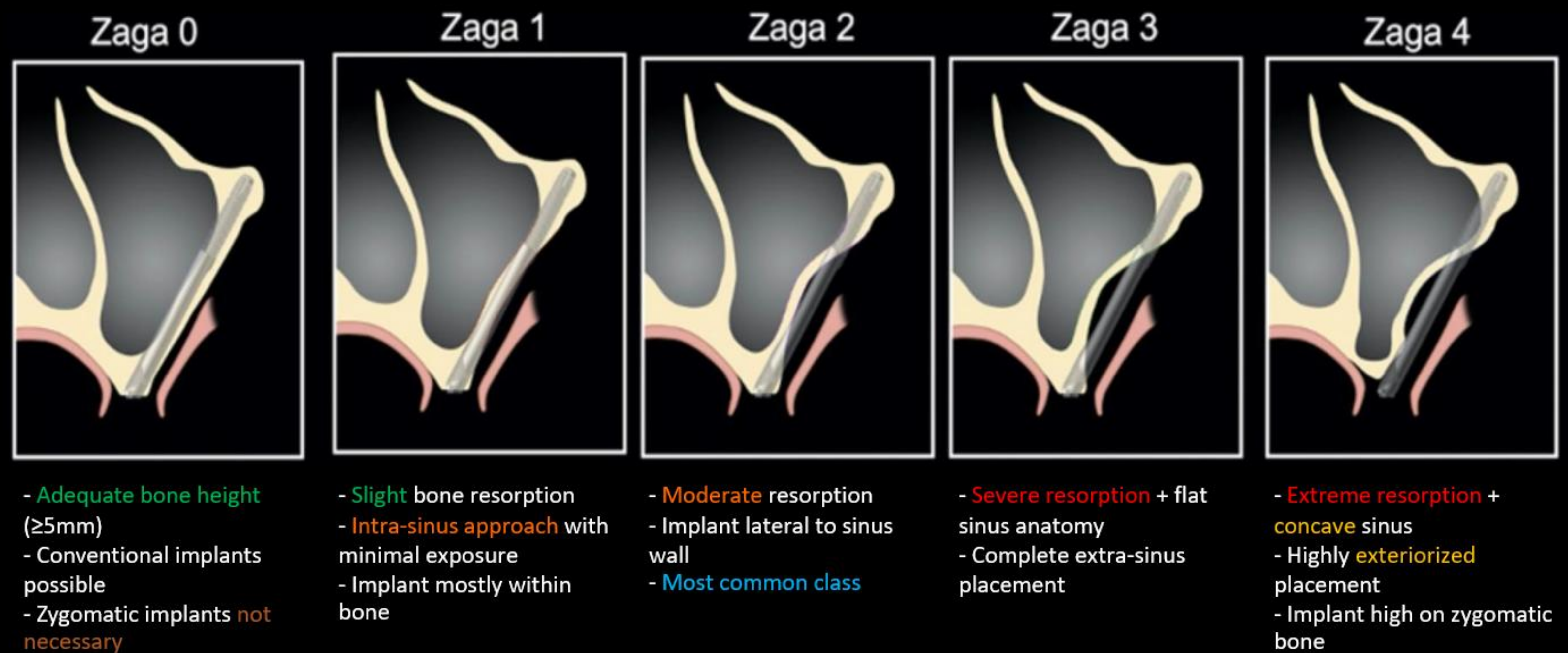
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## The History



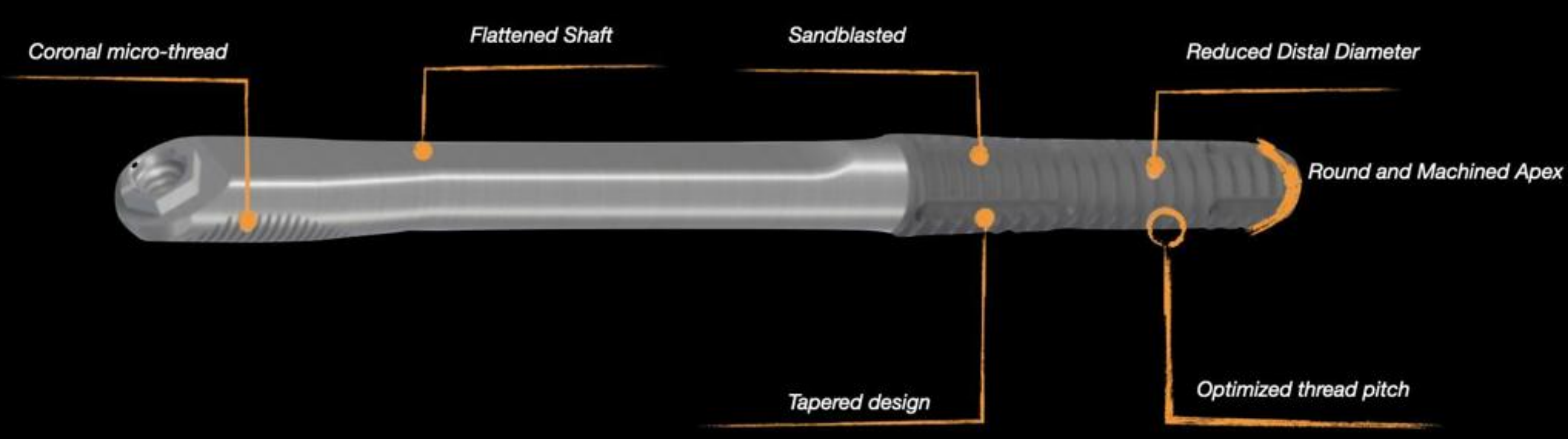
## Current Concepts

### Zygoma Anatomy-Guided Approach



Aparicio, 2011

## Zygomatic Implant Design



## Pre-operative Planning

Site #4

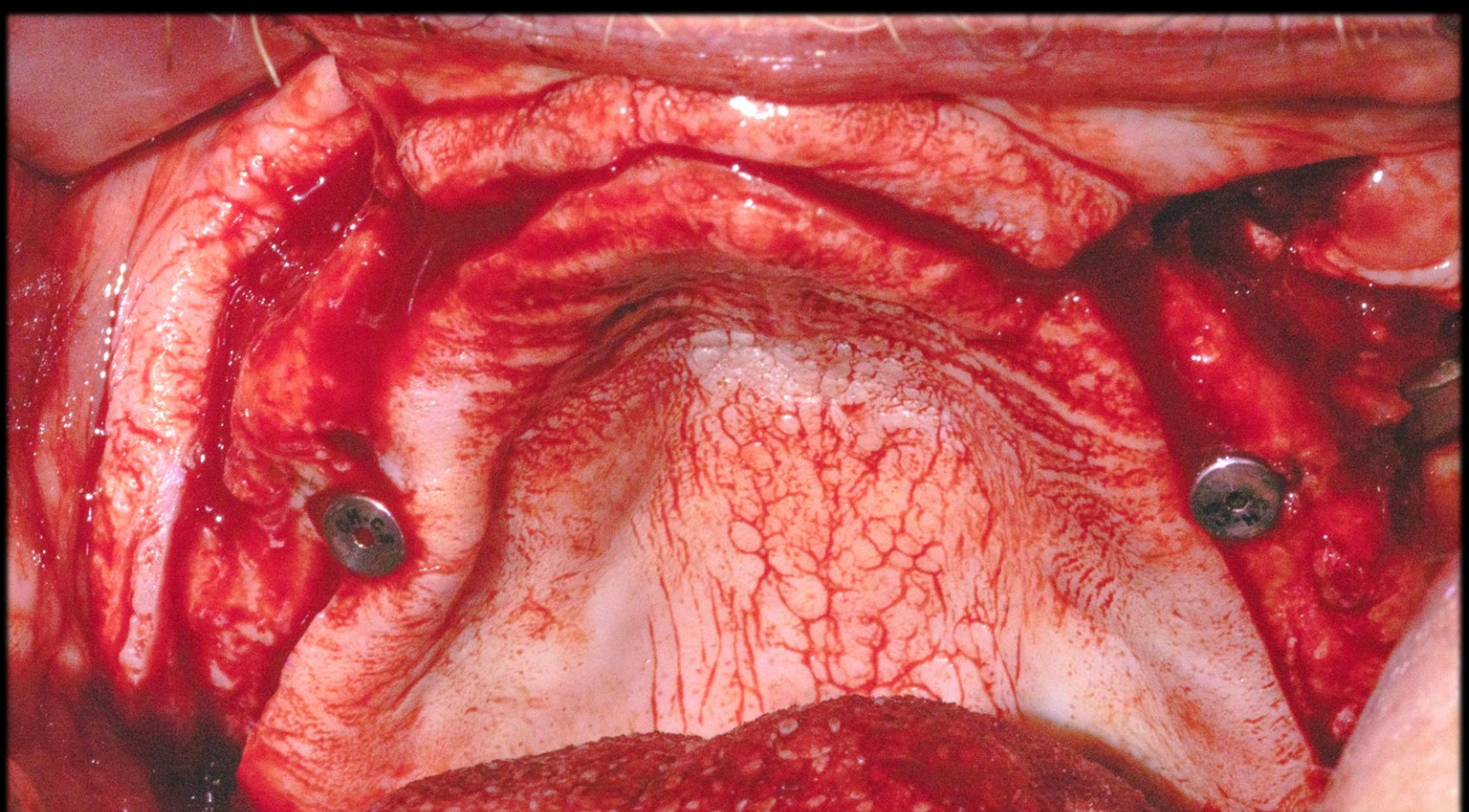
Site #12

| Maxilla - Implants |          |              |                             |          |         |         |
|--------------------|----------|--------------|-----------------------------|----------|---------|---------|
| Article no.        | Position | Manufacturer | Model                       | Length   | ø 1     | ø 2     |
| CH-ZC-45.0         | 4        | Straumann    | Zygomatic Implant ZAGA Flat | 45.00 mm | 4.30 mm | 2.60 mm |
| CH-ZC-47.5         | 13       | Straumann    | Zygomatic Implant ZAGA Flat | 47.50 mm | 4.30 mm | 2.60 mm |

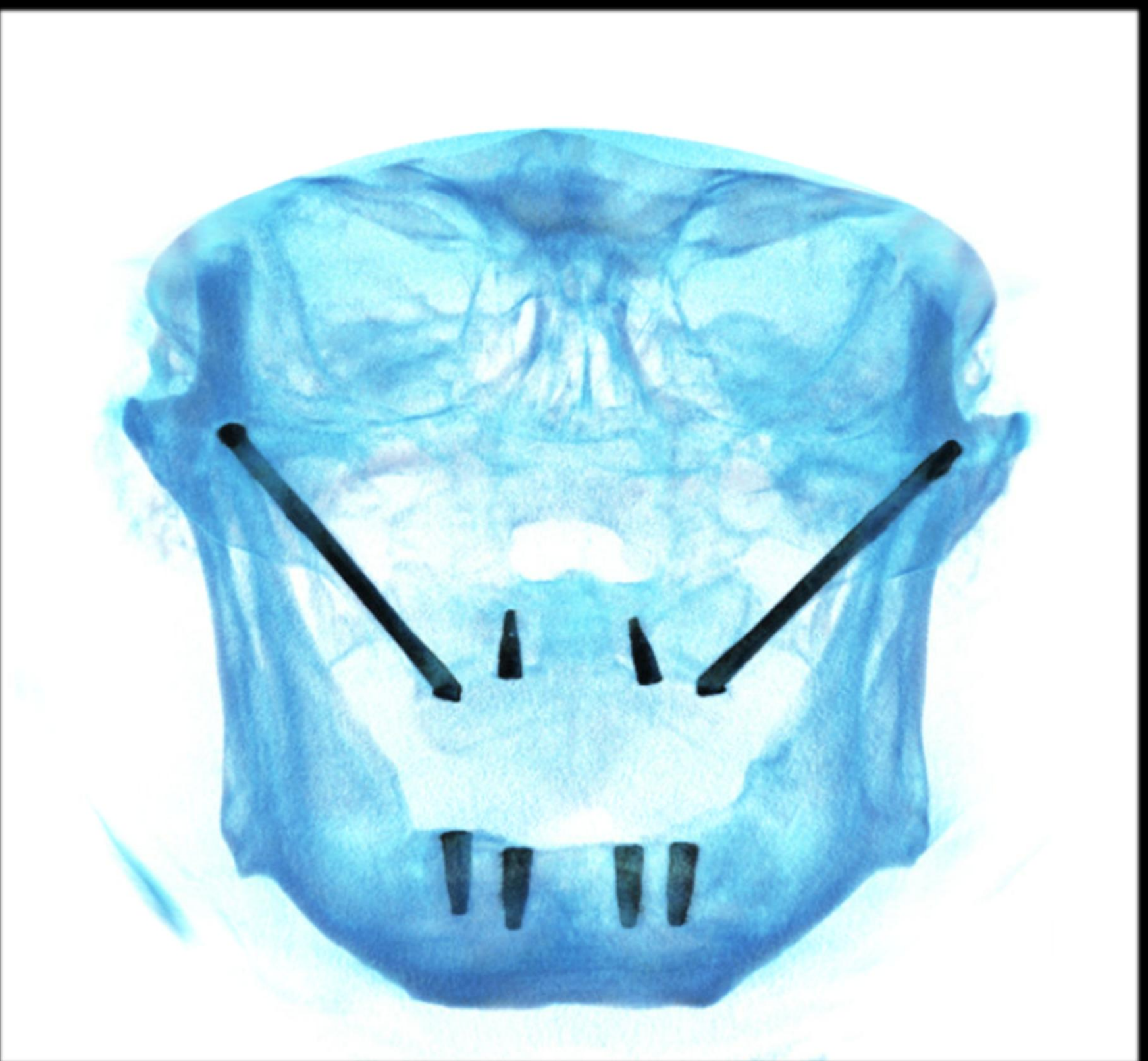
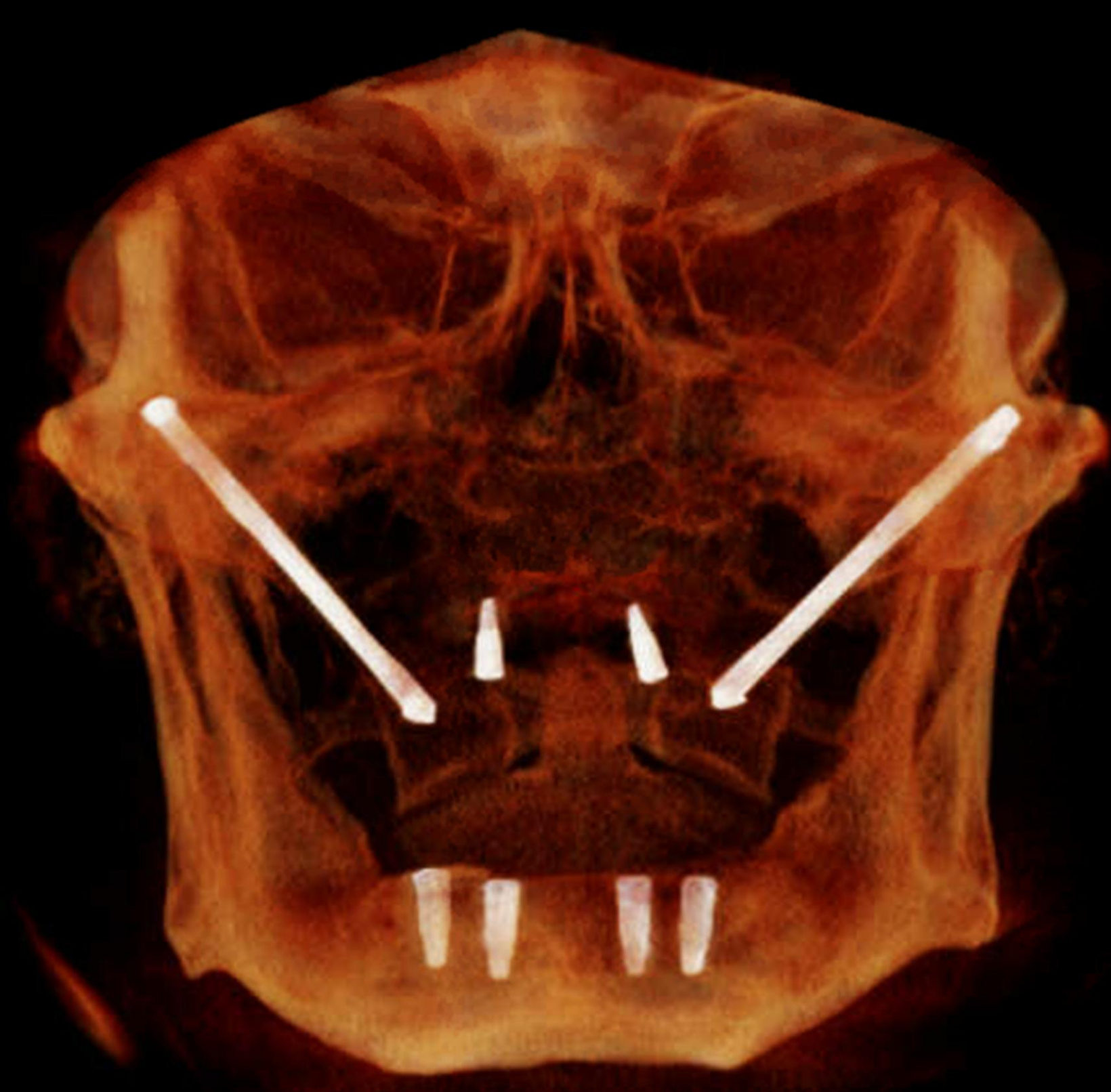
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## Operative Treatment



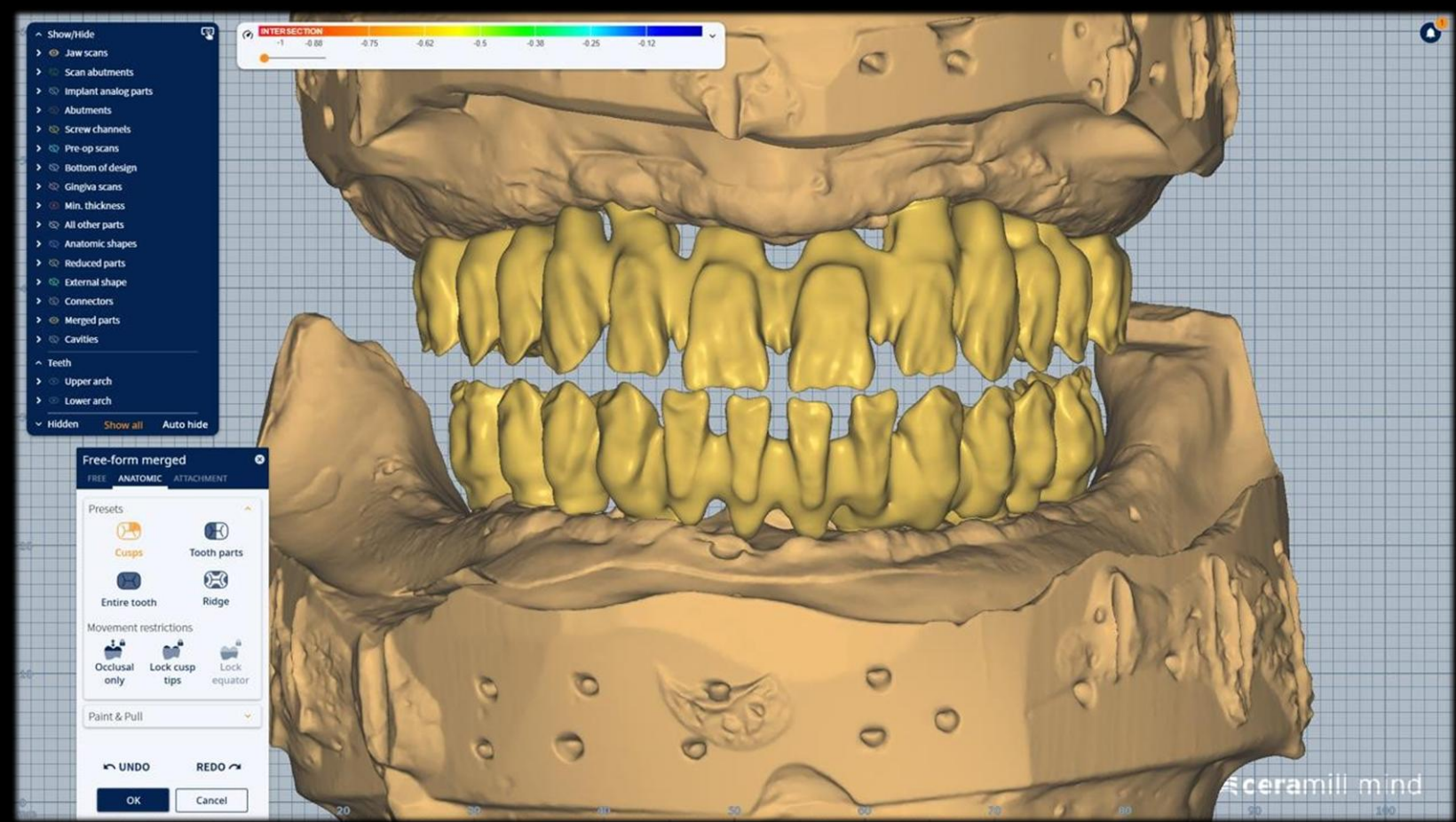
2 Zygomatic, 2 Conventional Endosseous



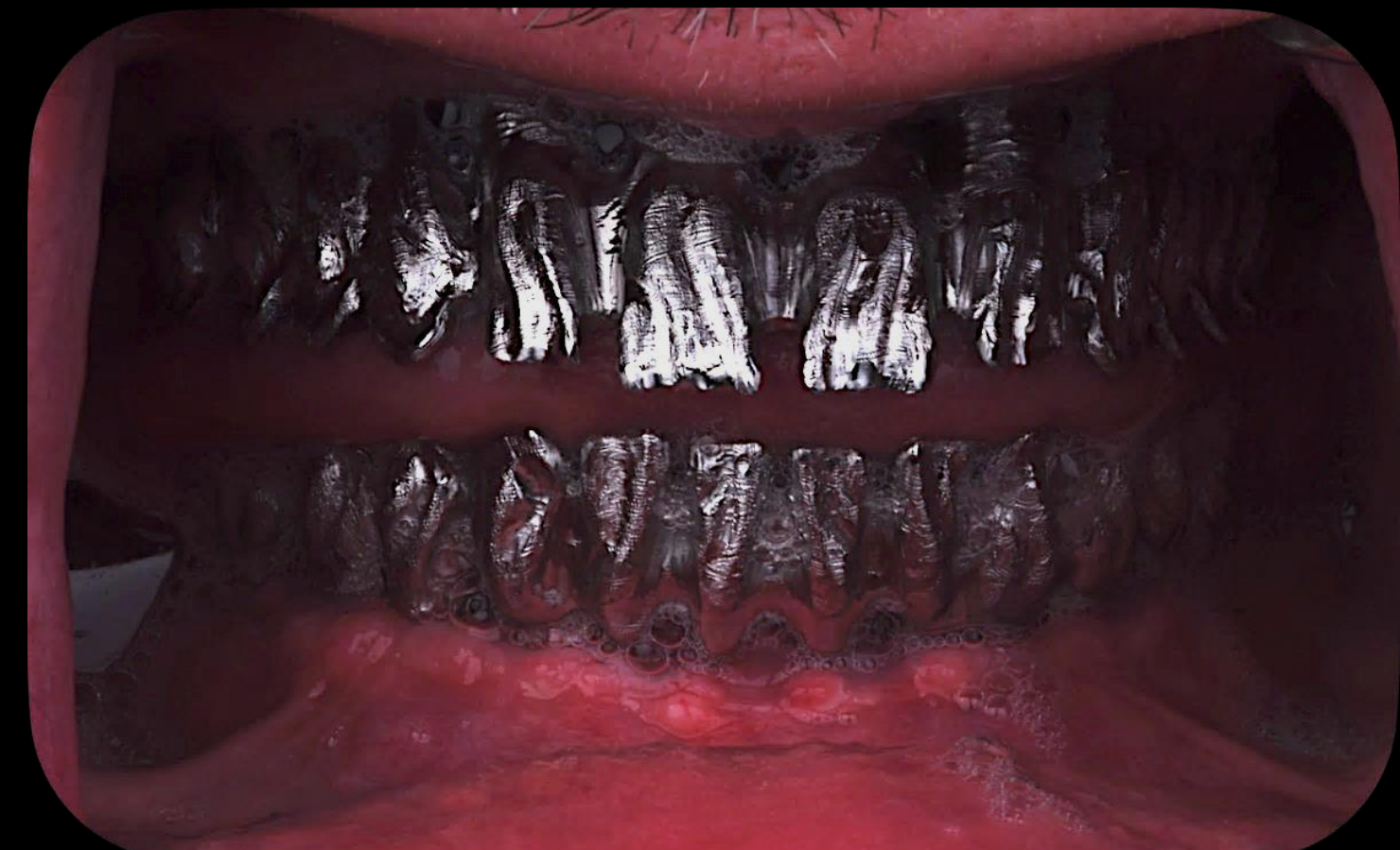
## Outcome



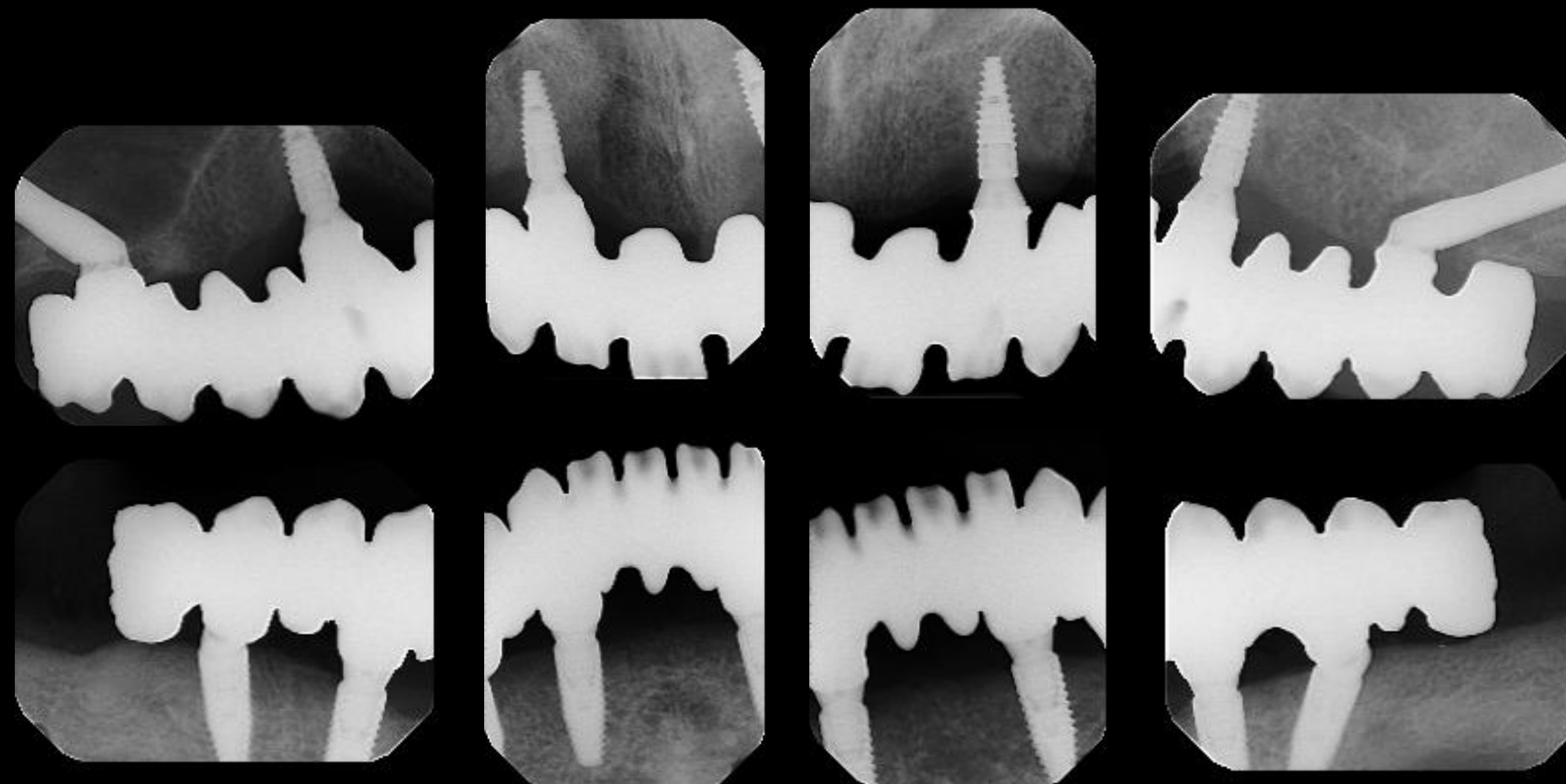
Prototype



Digital Design



Framework



Framework Try-in

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## Outcome



## Conclusions:

- AI-enhanced ZAGA planning enables *patient-specific, anatomically informed* implant trajectories
- Integration of prosthetically driven digital wax-ups improves functional and esthetic predictability
- Combining *biologic insight with digital intelligence* bridges *surgical precision* and *prosthetic artistry*
- Represents a *future-oriented* paradigm for rehabilitation of the atrophic maxilla