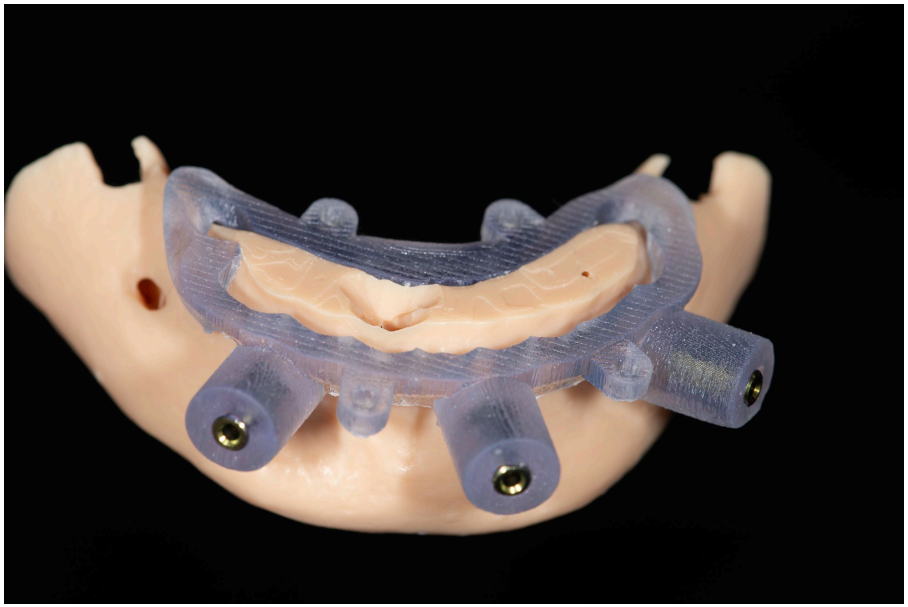
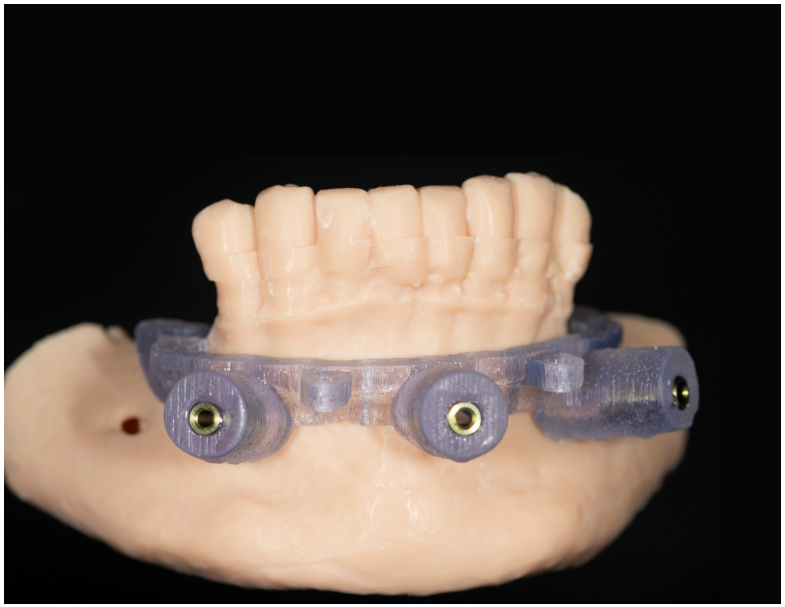
Implant Guided surgery





Prepared by: **Dr. Ranj Azad**

Introduction

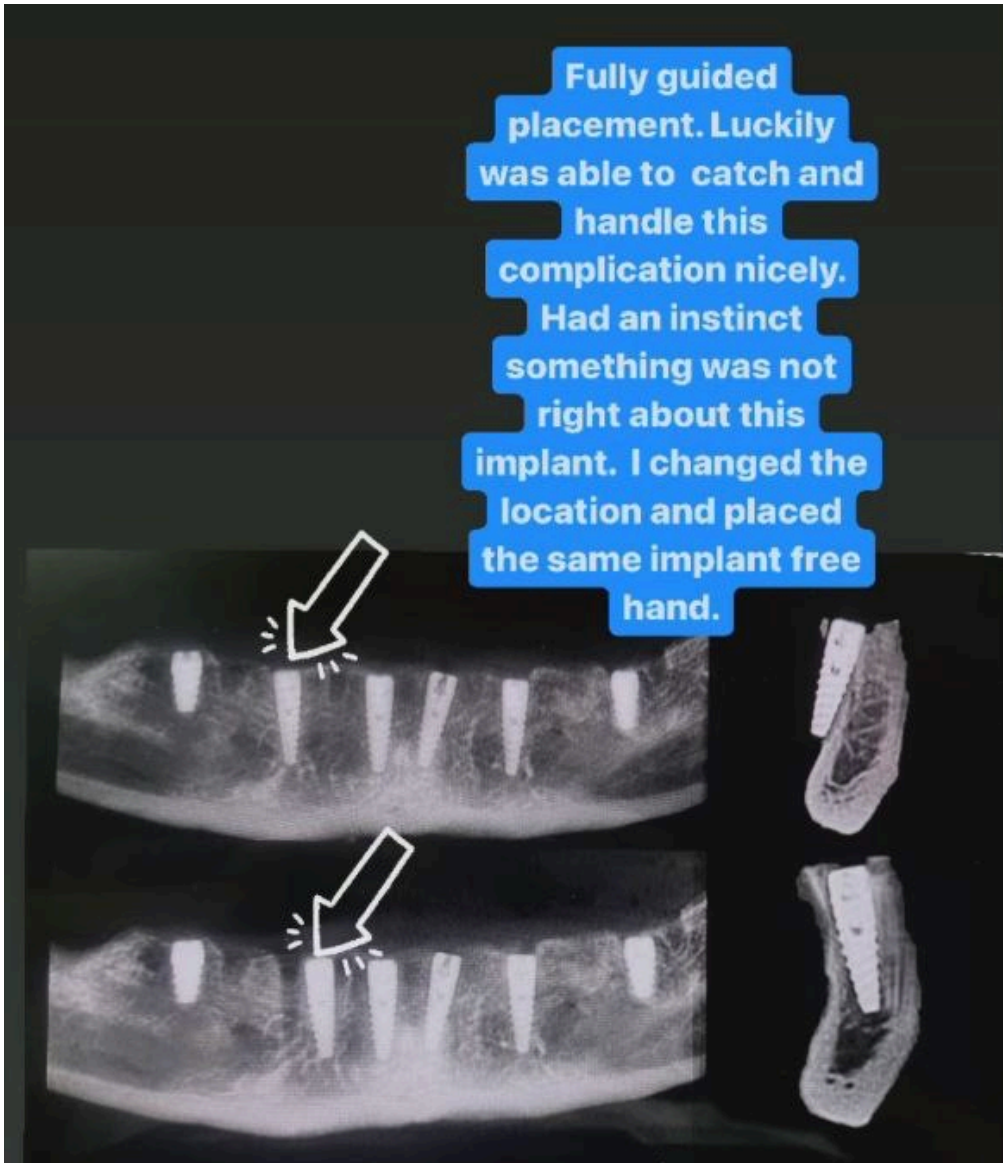
- Guided surgery is a game changer for dental implant placement & has gained massive popularity.

Introduction

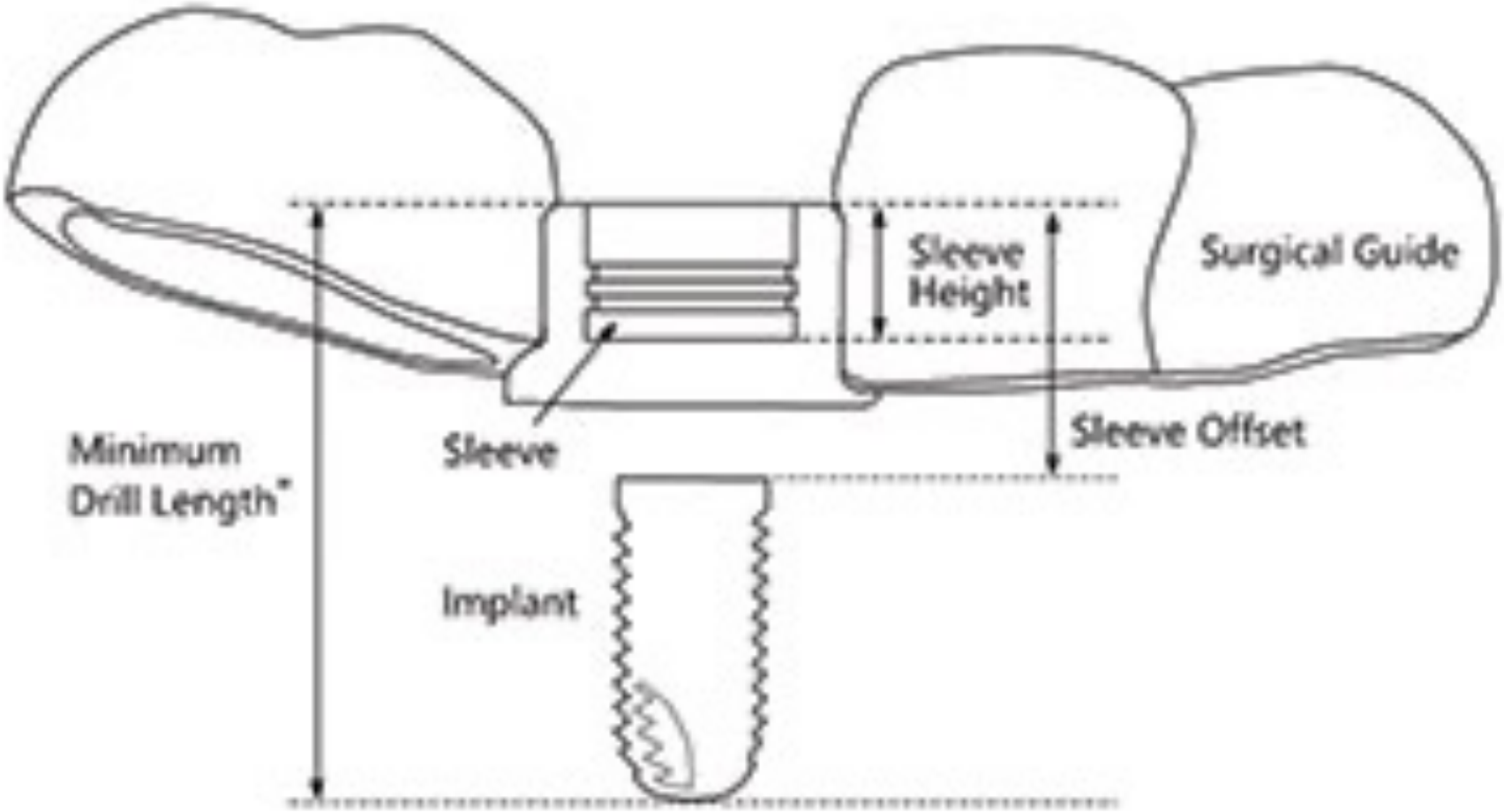
- In 2018, Younes et al wrote that guided surgery "should be the **golden standard** approach when perfect implant positioning is required."

Introduction

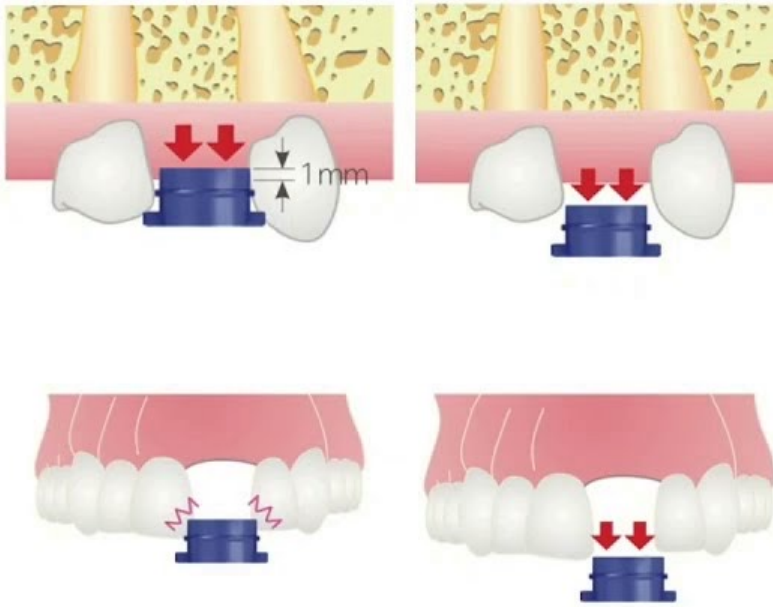
Introduction

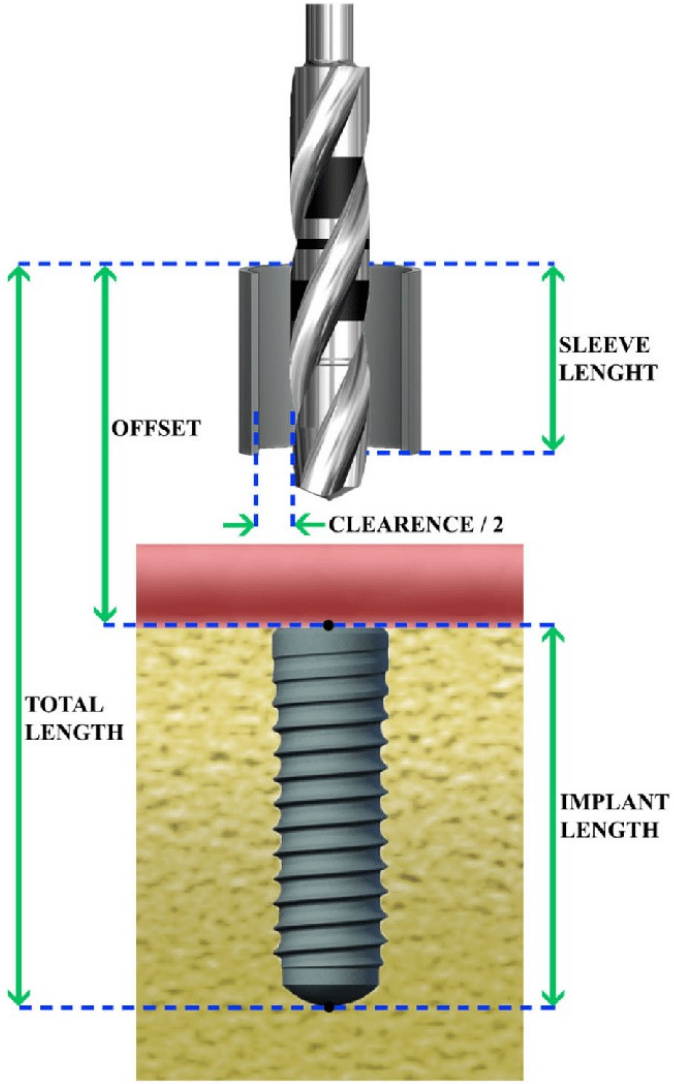


Introduction



Introduction

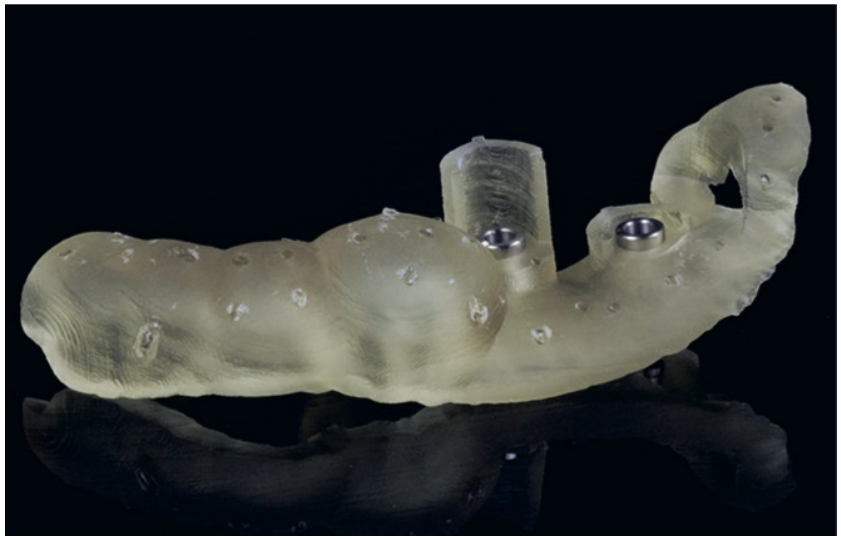


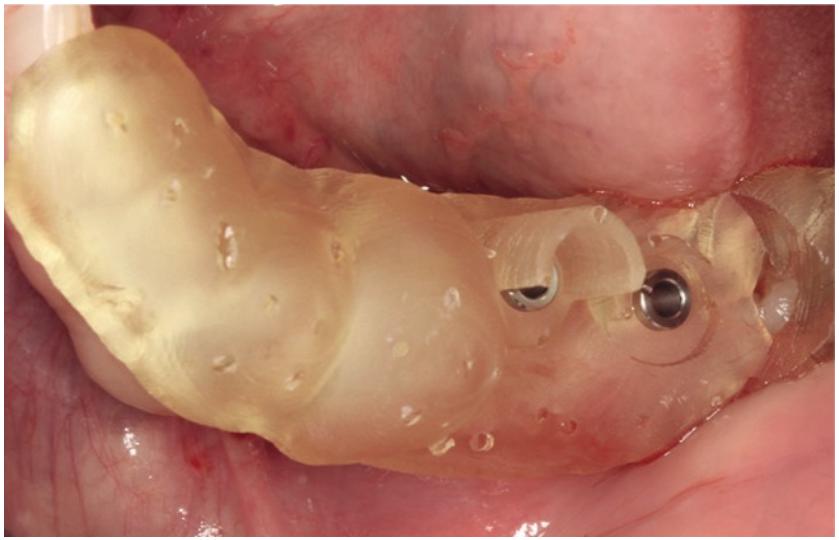


Introduction

- There are **3 general categories** of surgical guides

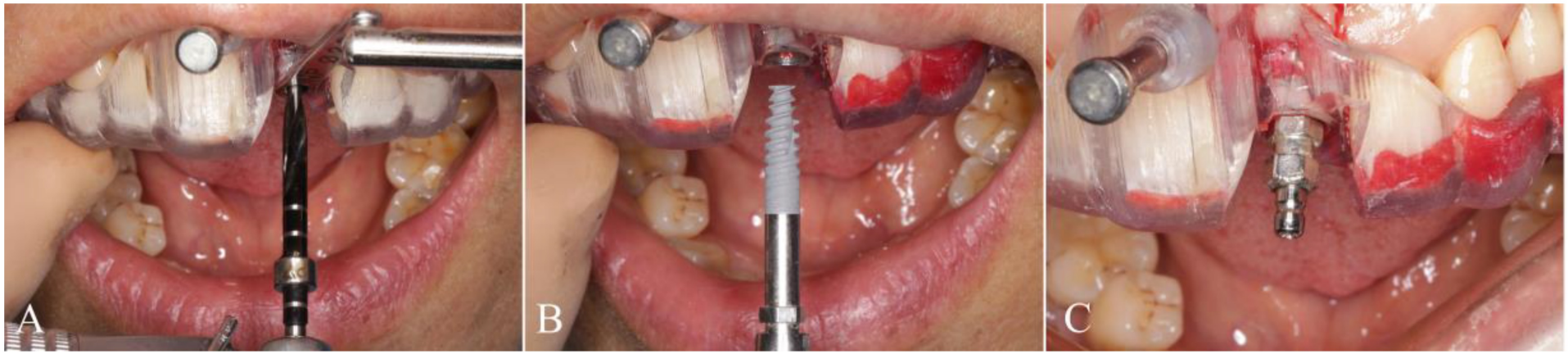
Pilot drill guides





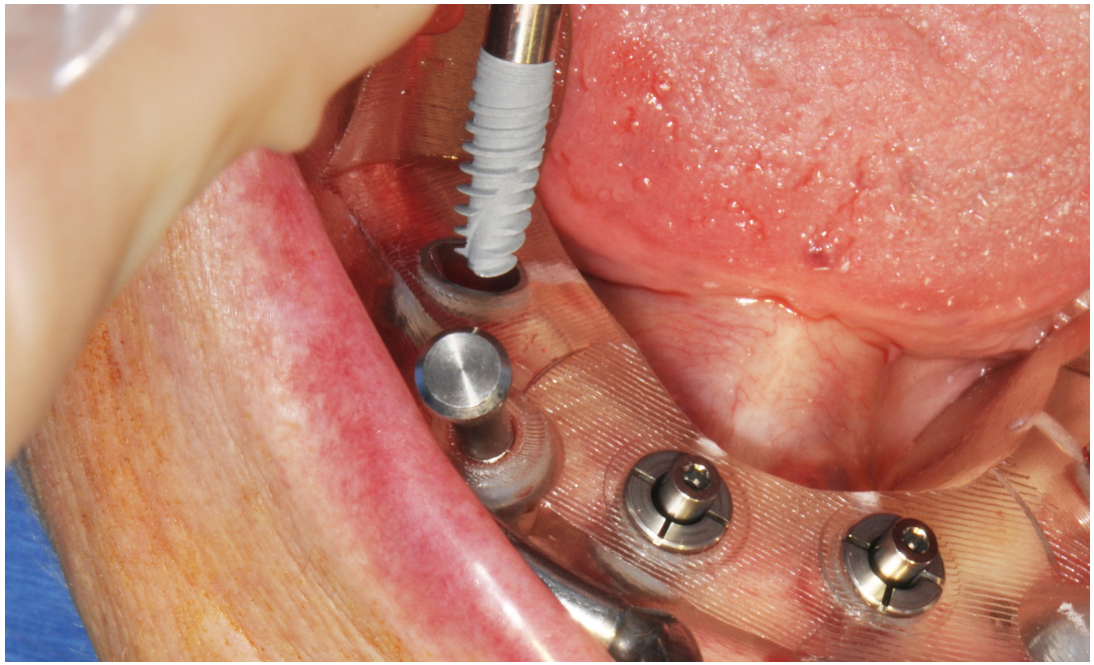
Introduction

- **Guides for partially guided surgery**
- *Weak bone-* undersize the osteotomy.
- *Bone overheating*
- Placing implant freehand.



Introduction

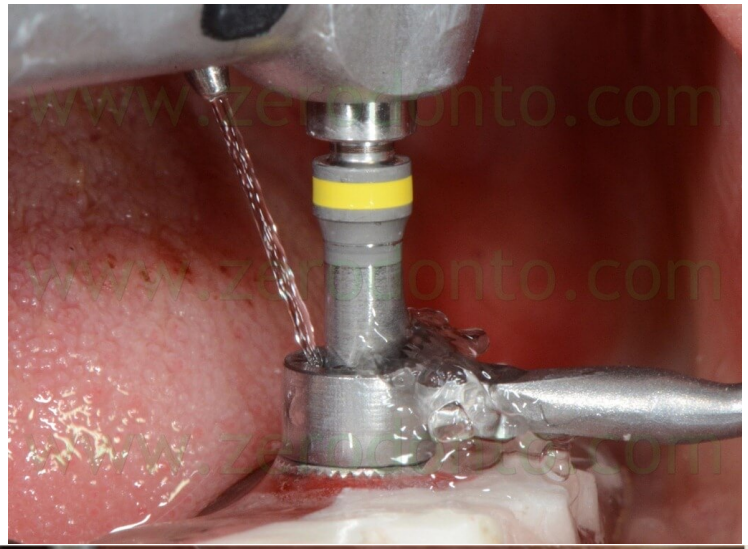
- Guides for fully guided surgery

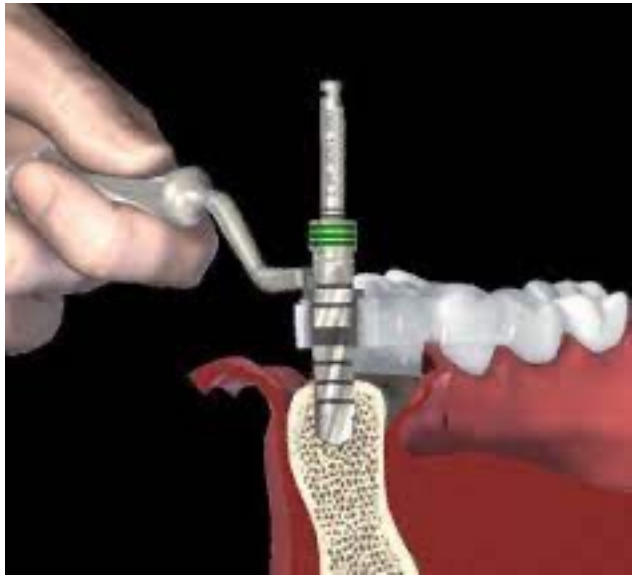


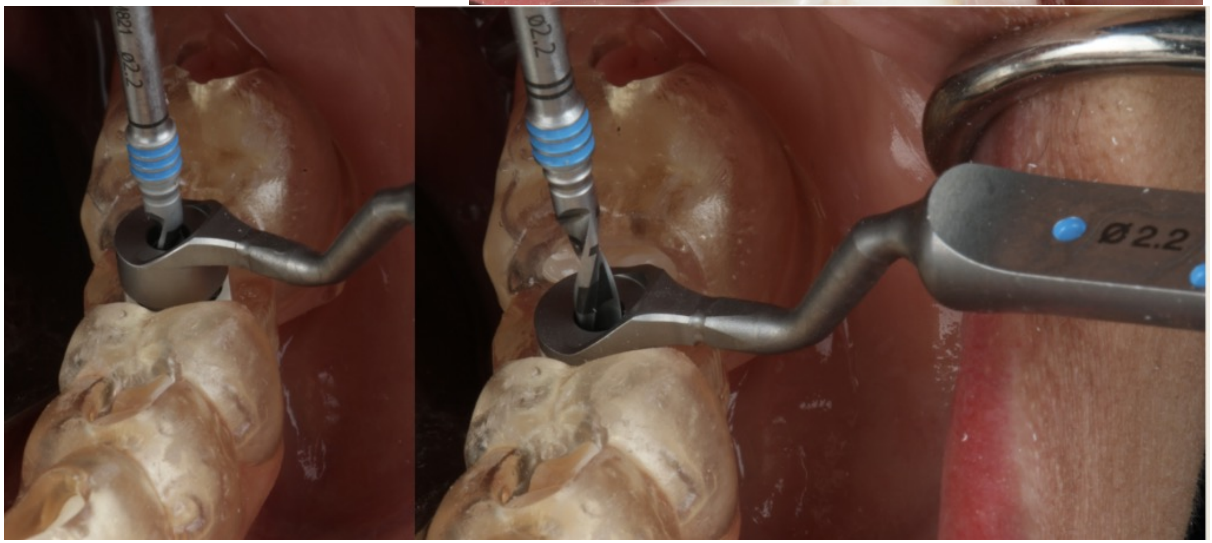
Introduction

Guides for fully guided surgery

1. Keyed fully guided
2. Keyless system





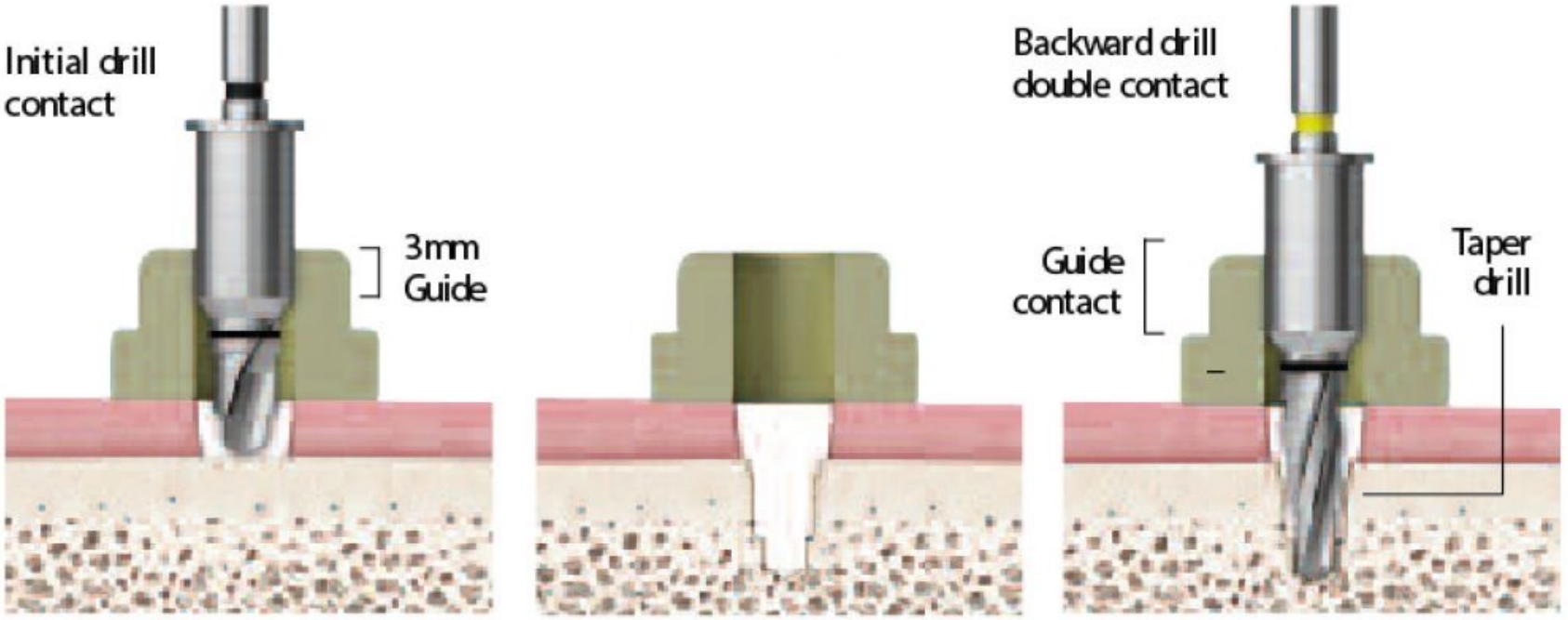


Introduction

Introduction

Guides for fully guided surgery

- **Keyless system**

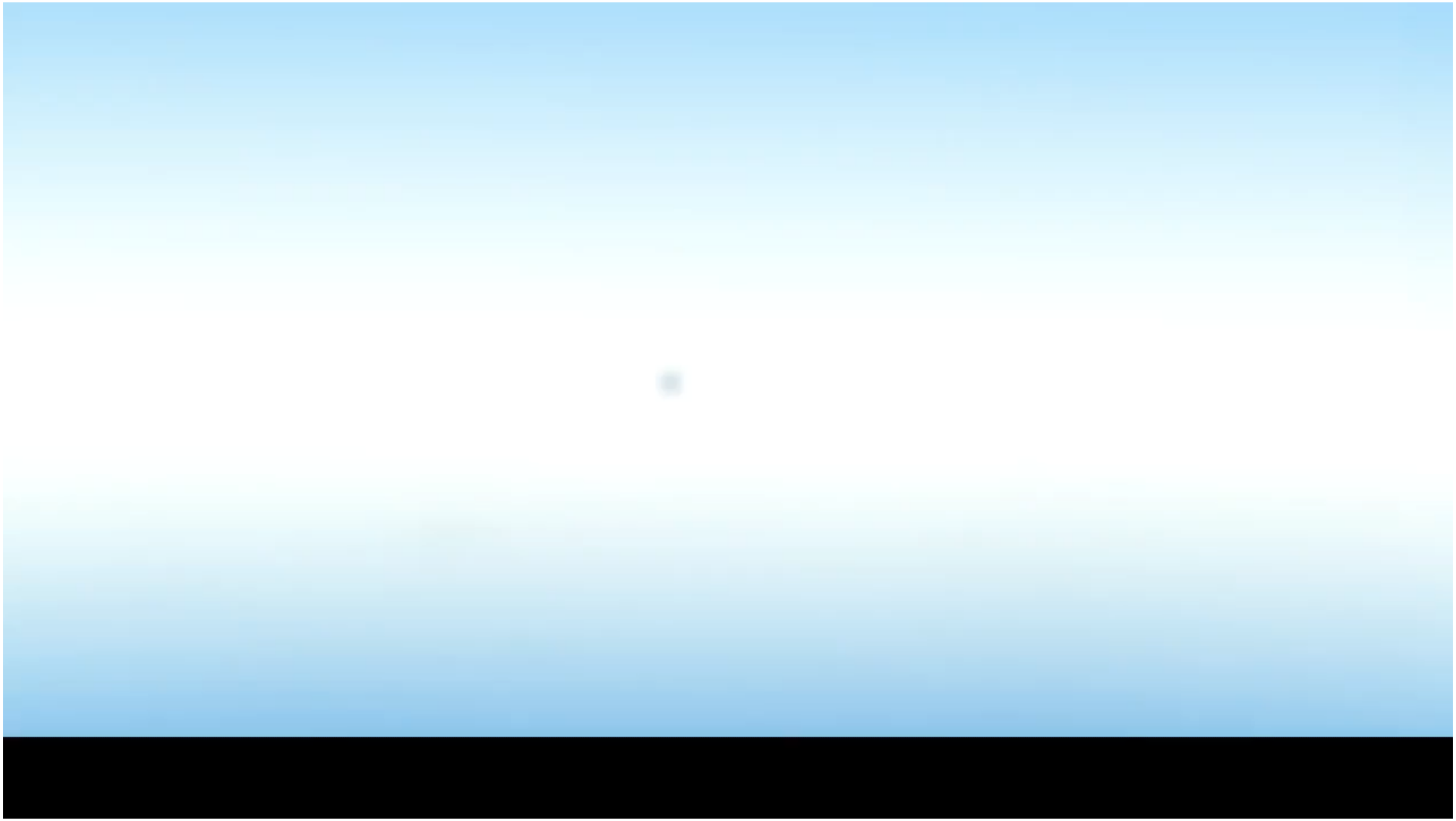


Introduction

Guides for fully guided surgery

- **Keyless system**

Introduction

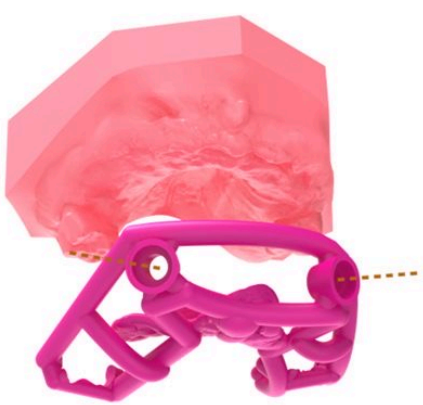


Introduction

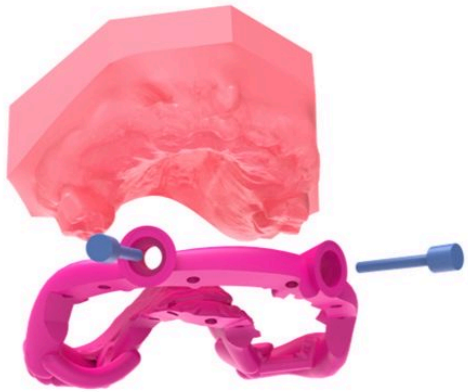
- **Guides for fully guided surgery**

Stackable fully guided

- **Base guide:** lateral fixation pins to support multiple interchangeable guides on top.
- Bone reduction needed.



Fixation Guide



Base

Drilling Guide

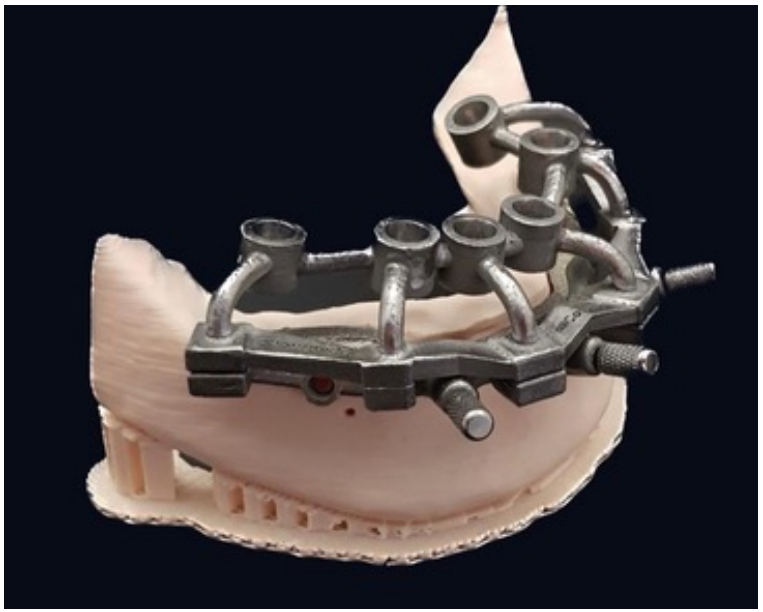
Provisional Holder

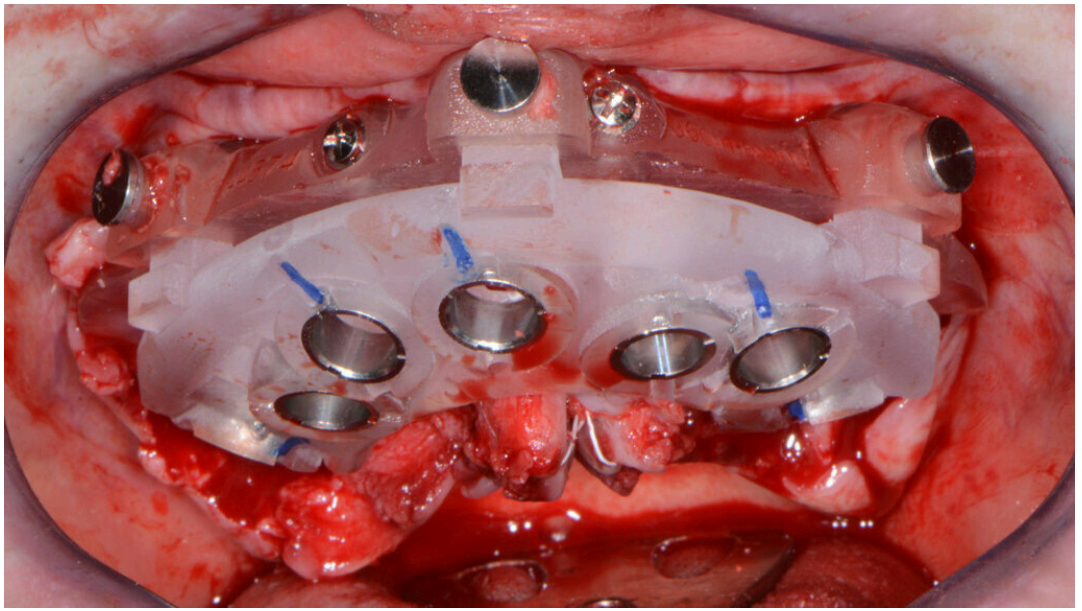
Introduction

Guides for fully guided surgery

Stackable fully guided

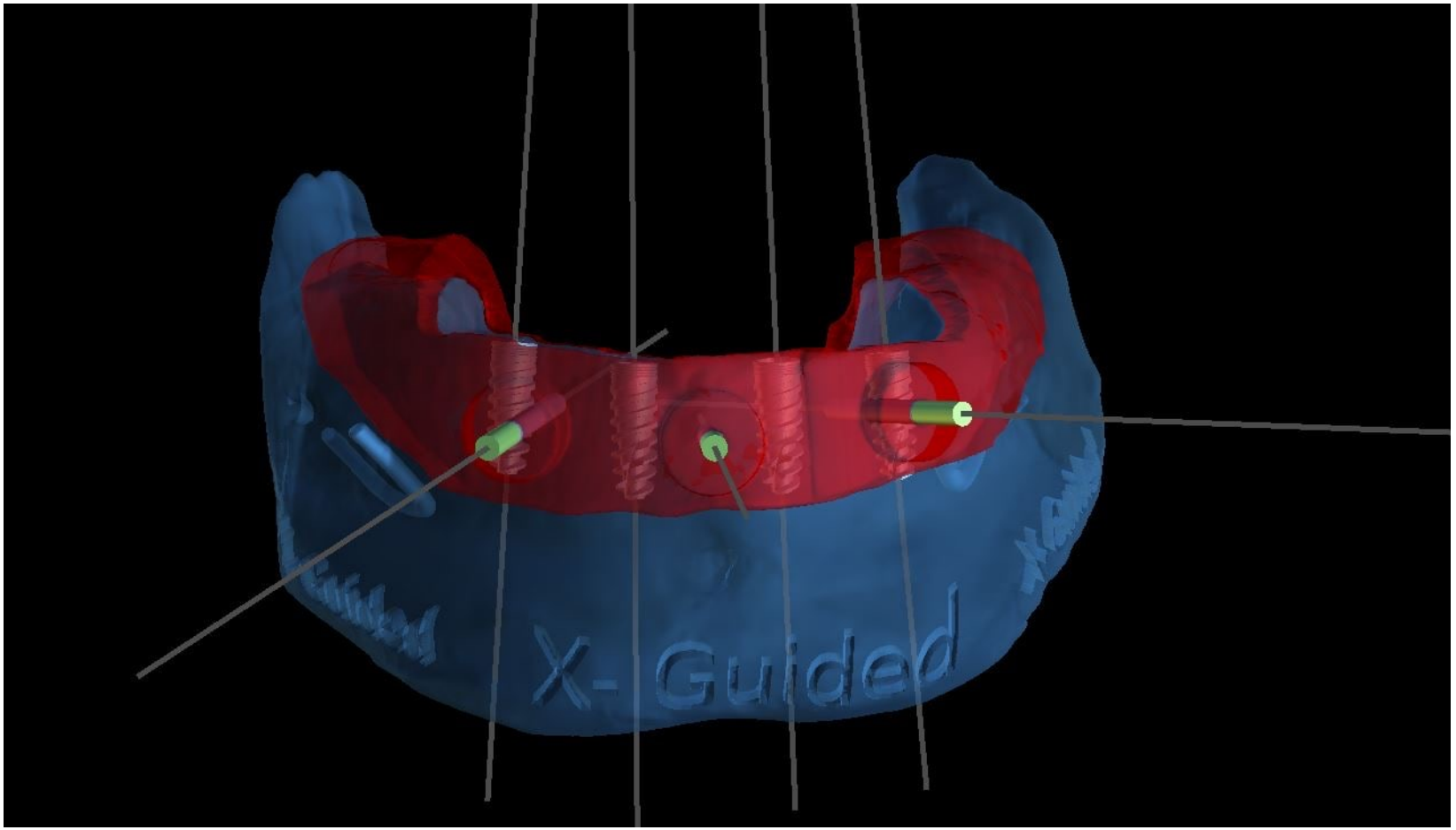
- Retention Magnetic or mechanical with use of pins or slots.





Introduction

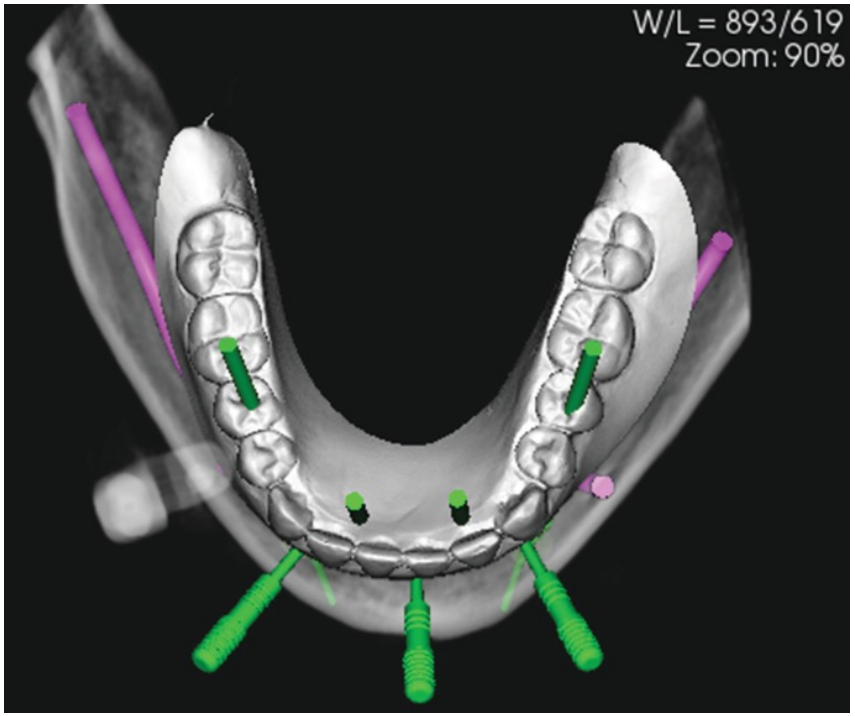
- **Guides for fully guided surgery**



Introduction

Advantages guided

- Accuracy of placement compared to freehand surgery
- Fewer complications
- Less risk for injury
- Efficient surgery
- Better prosthetic results

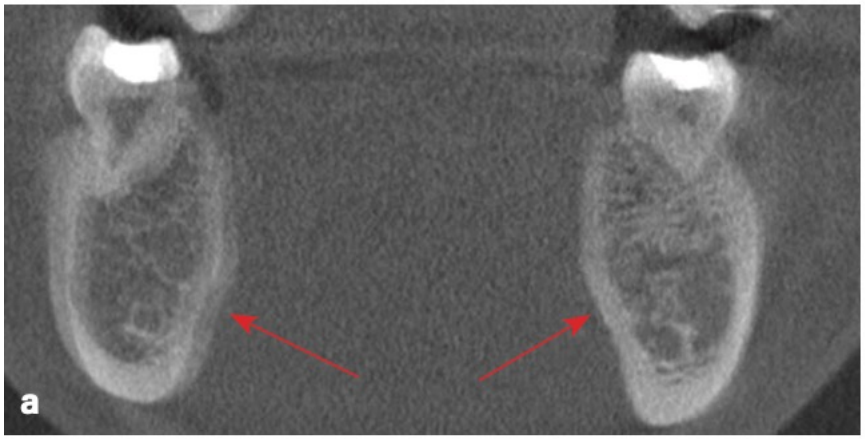


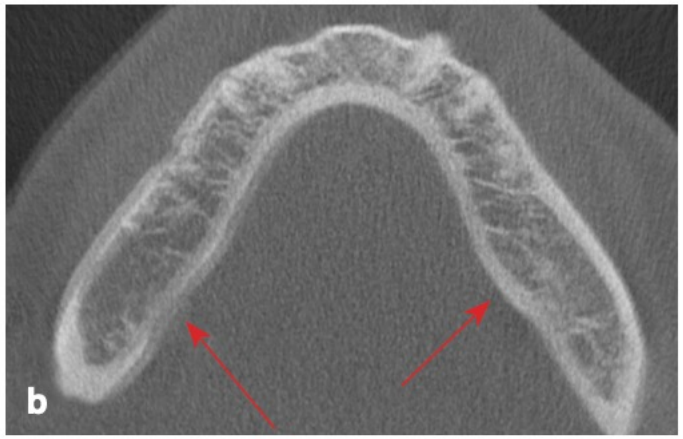
Introduction

Disadvantages

Guided surgery is by no means fool proof & certainly has its limitations

- Accurate CBCT scanning without patient movement

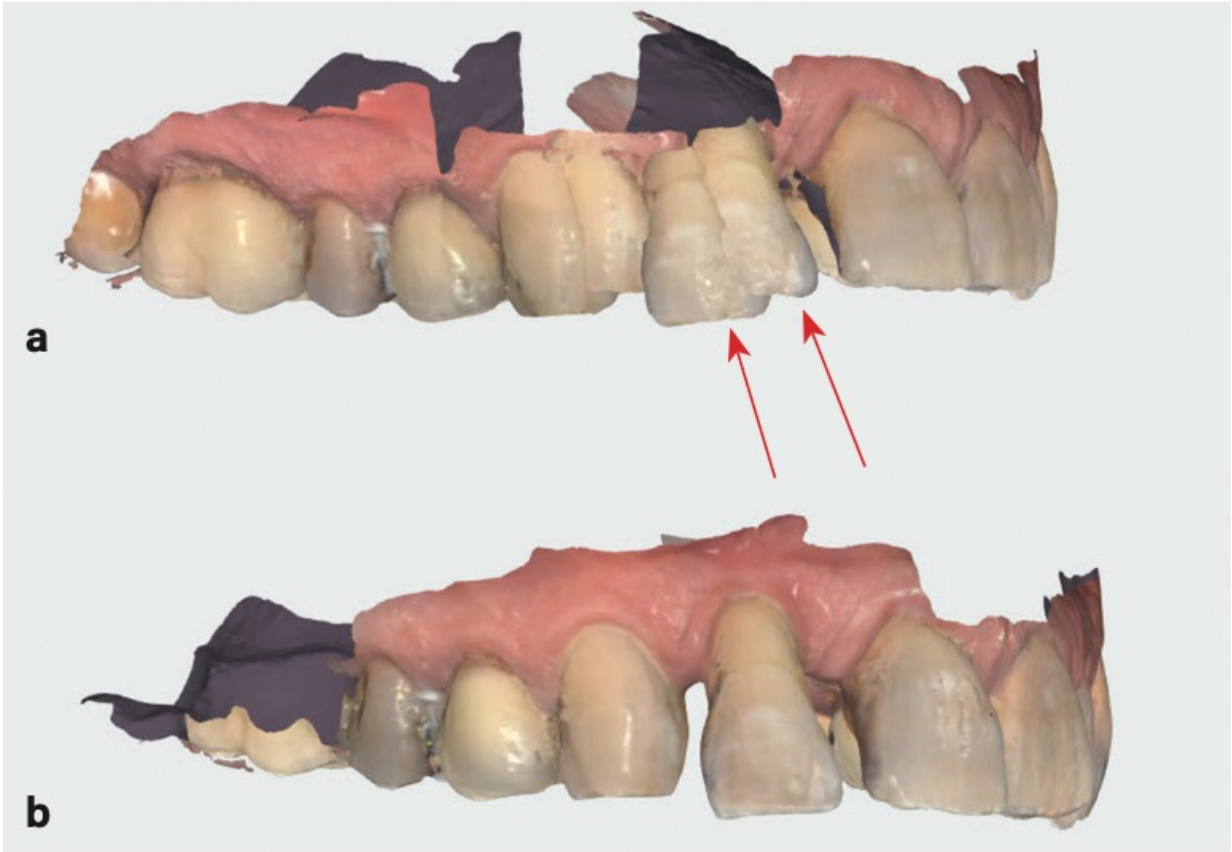




Introduction

Disadvantages

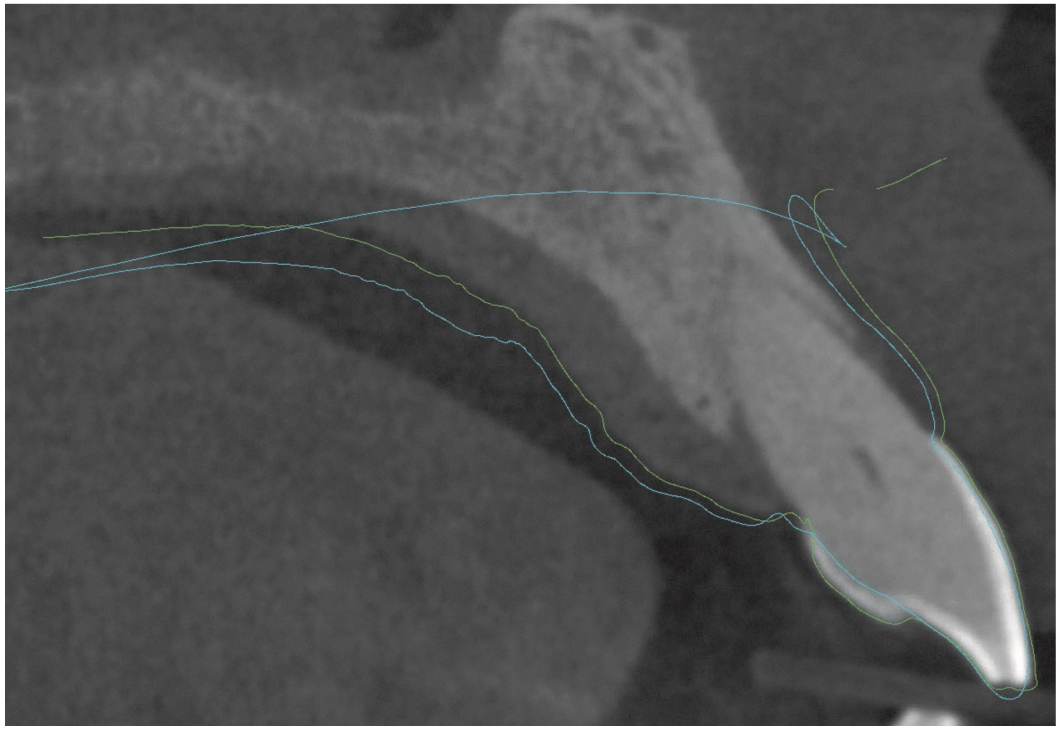
- Proper intra oral scanning without double scanning



Introduction

Disadvantages

- Proper **stitching** of CBCT to STL data



Introduction

- The fabrication of any surgical guide relies on data acquisition:

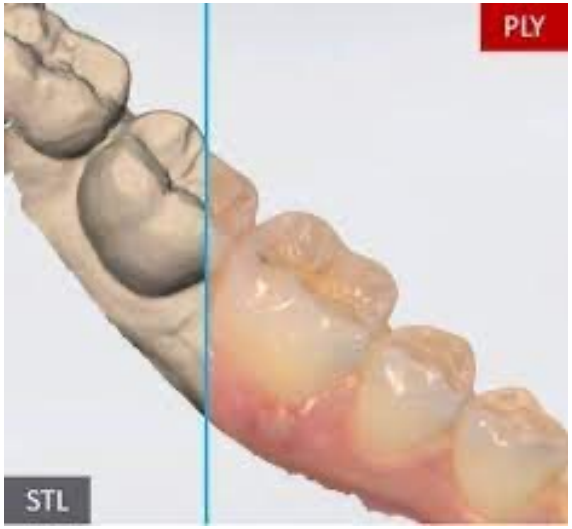
DICOM

- **CBCT**

DICOM℠
Digital Imaging and Communications in Medicine

STL/PLY

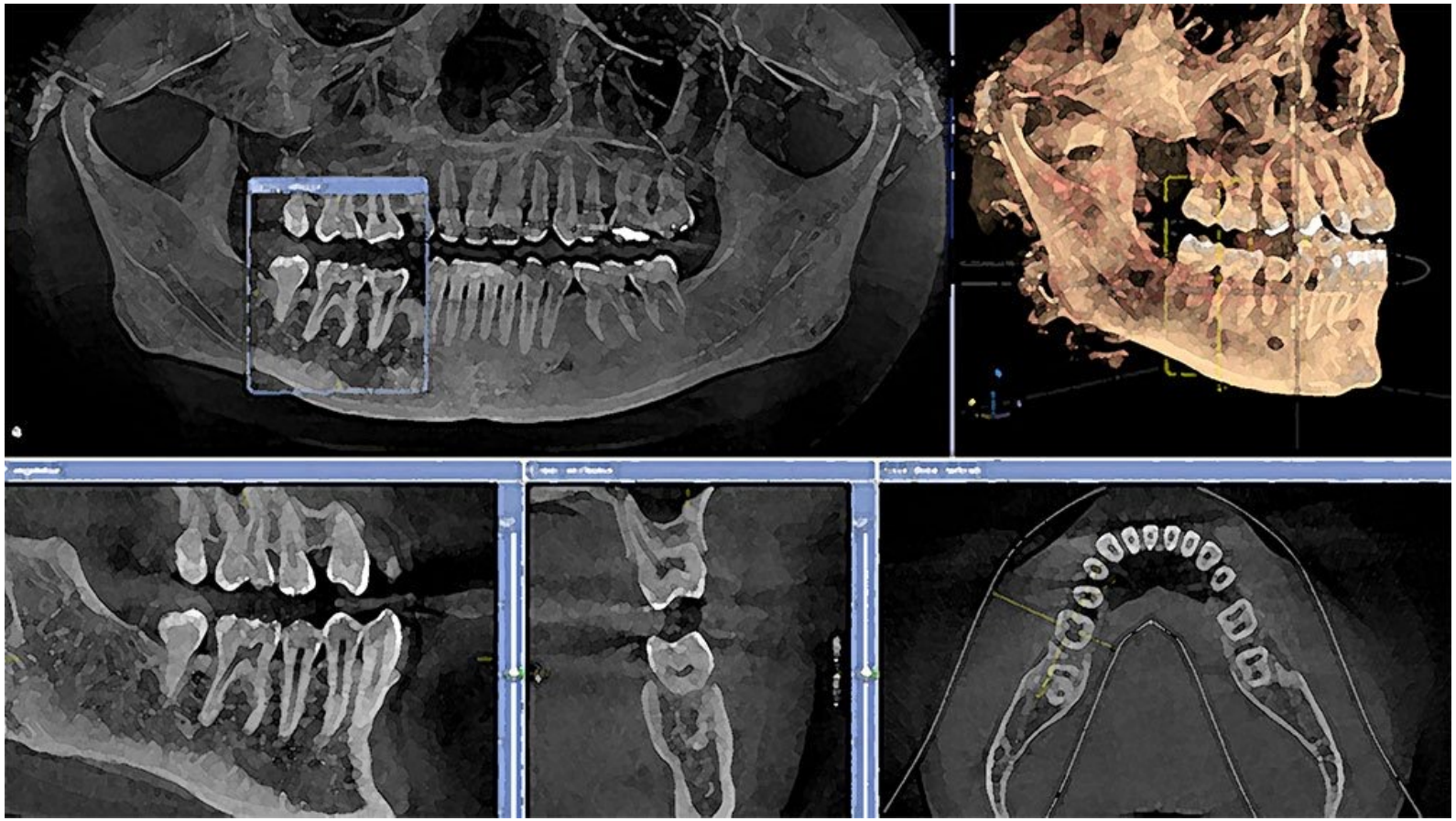
- **Cast**
- **Impression**
- **Dentures**



Introduction

DATA ACQUISITION

- CBCT



Introduction

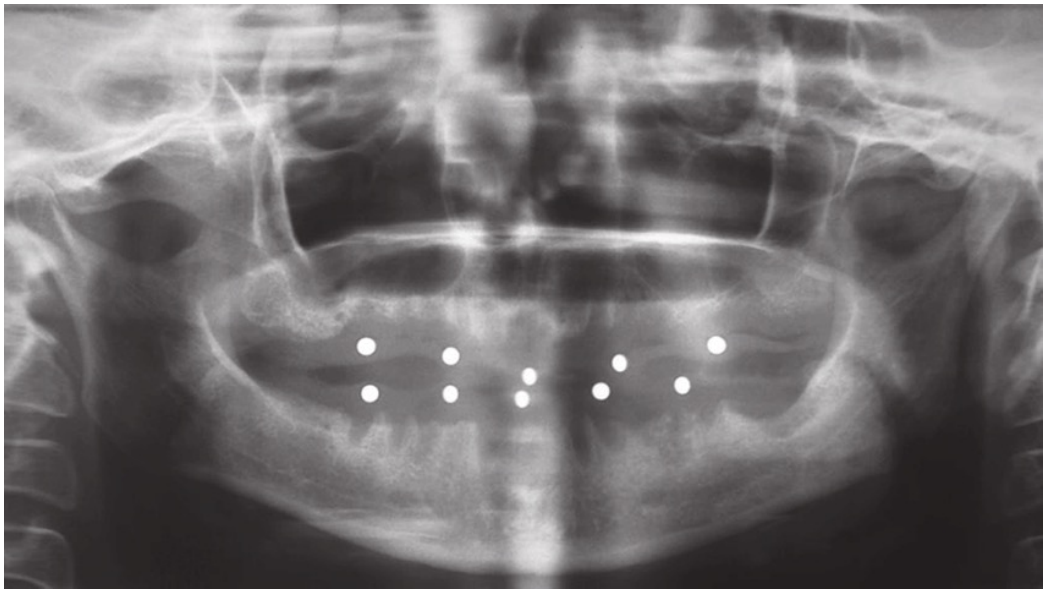
DATA ACQUISITION

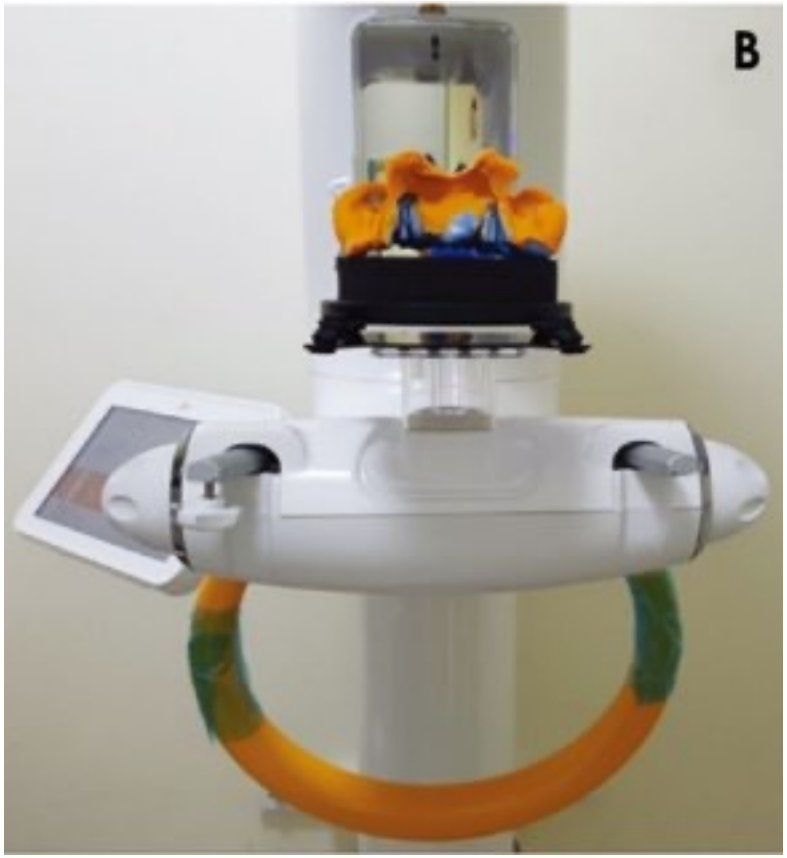
- CAST/ impression

Introduction

DATA ACQUISITION

- Impression





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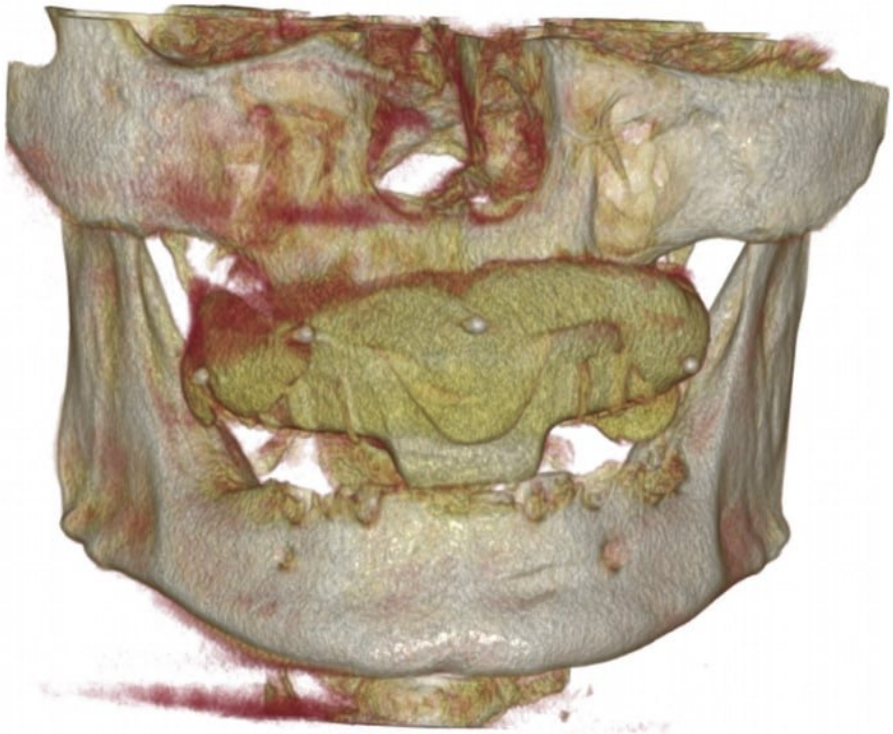
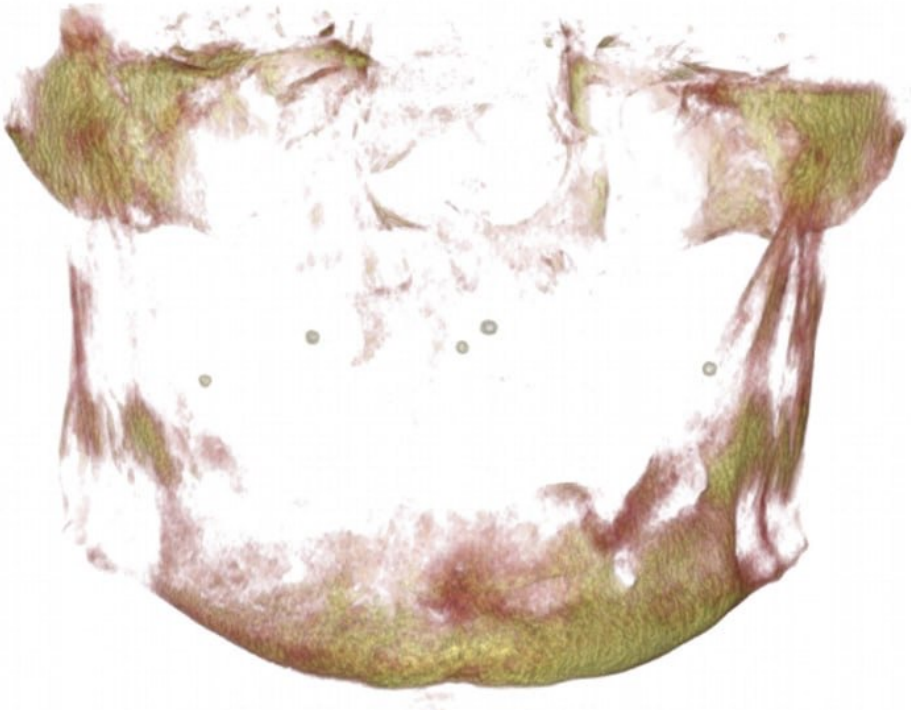
Data acquisition

- Impression





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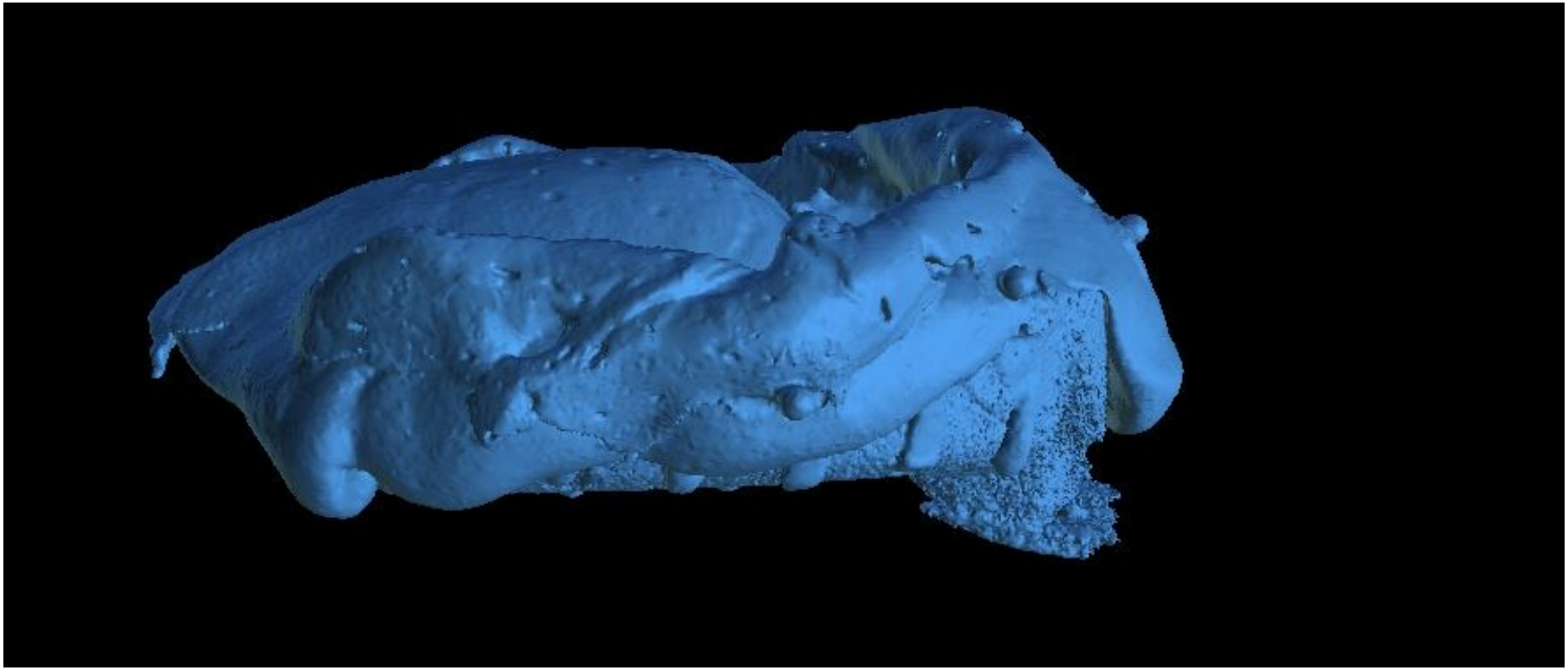

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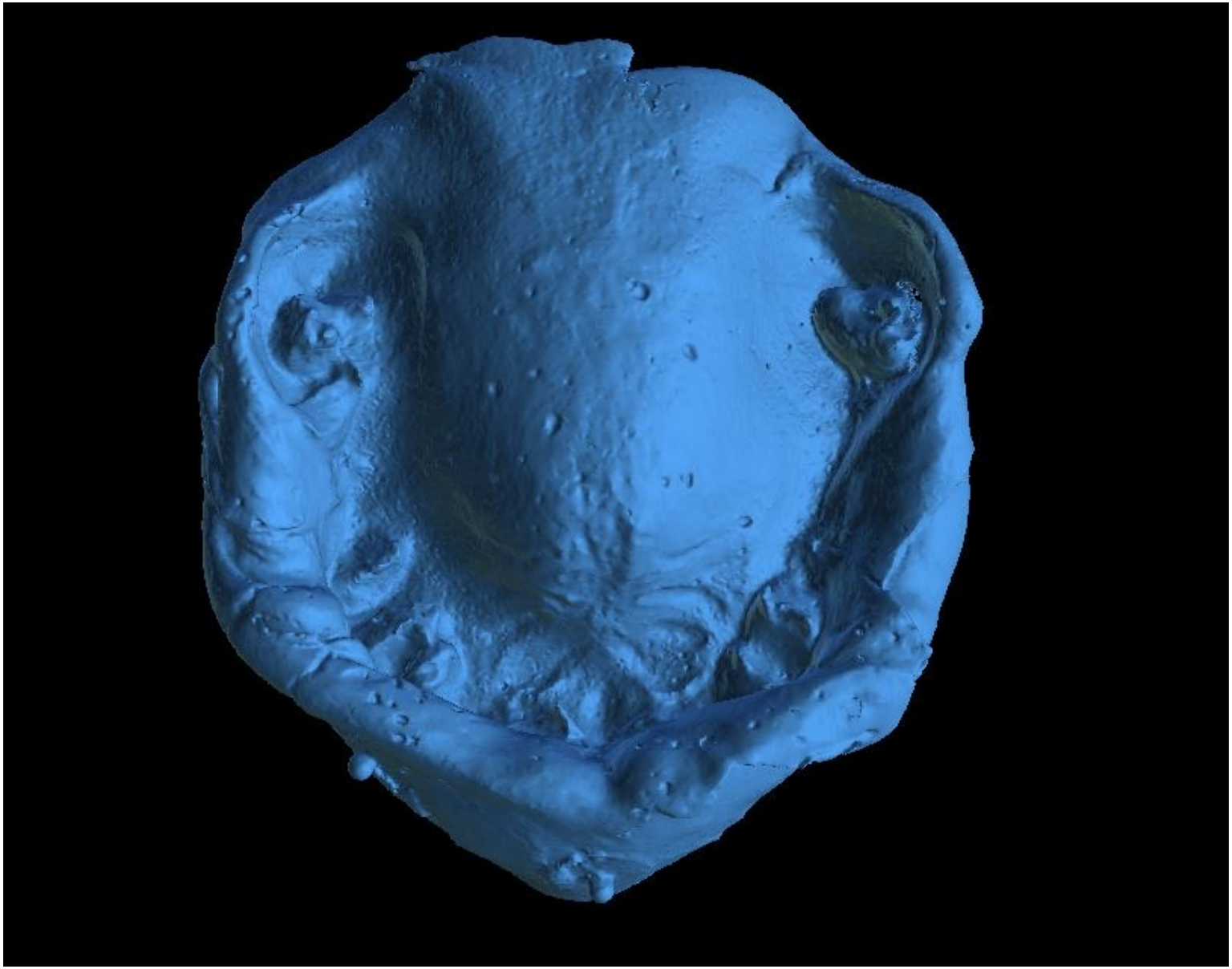

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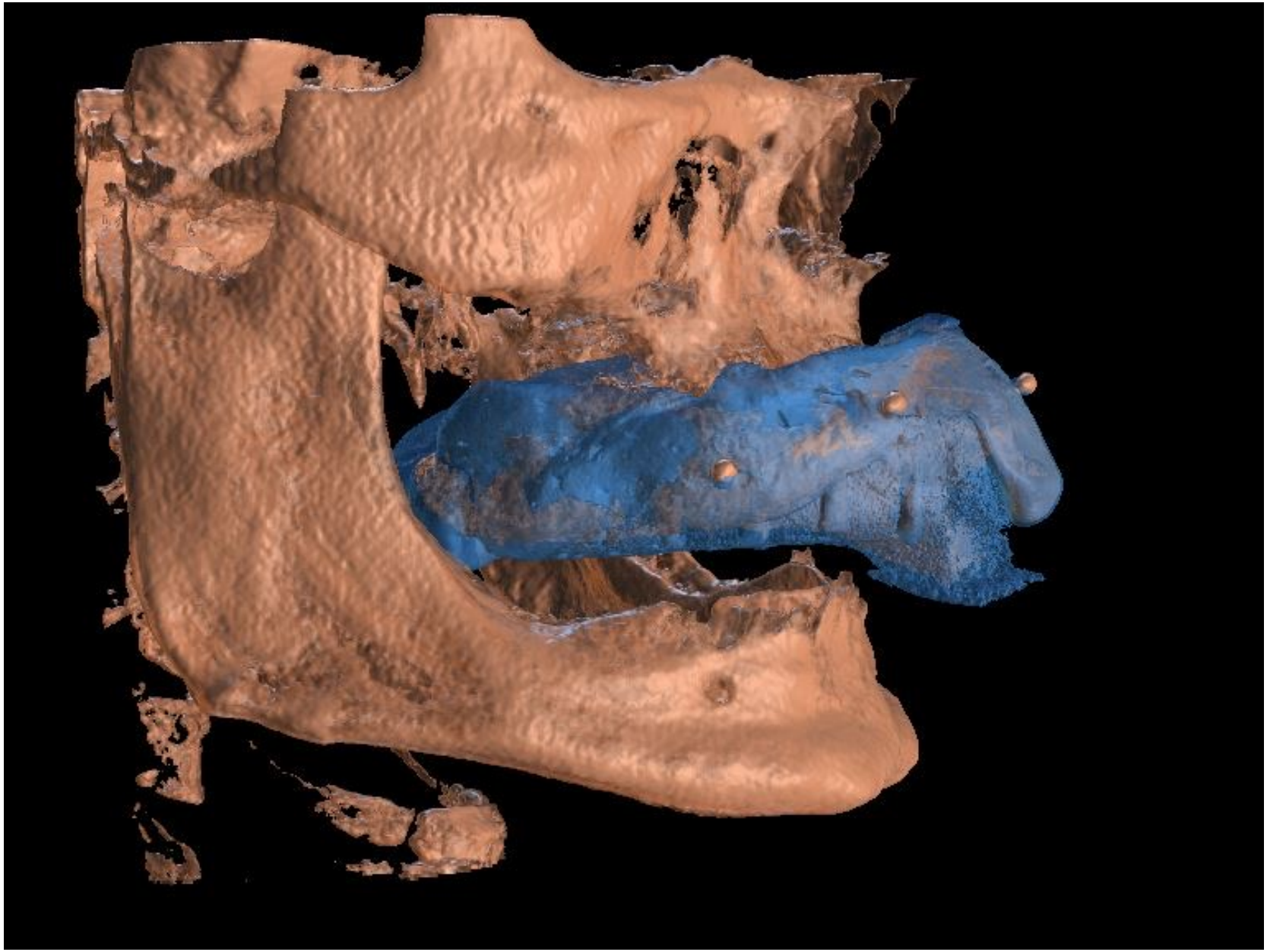

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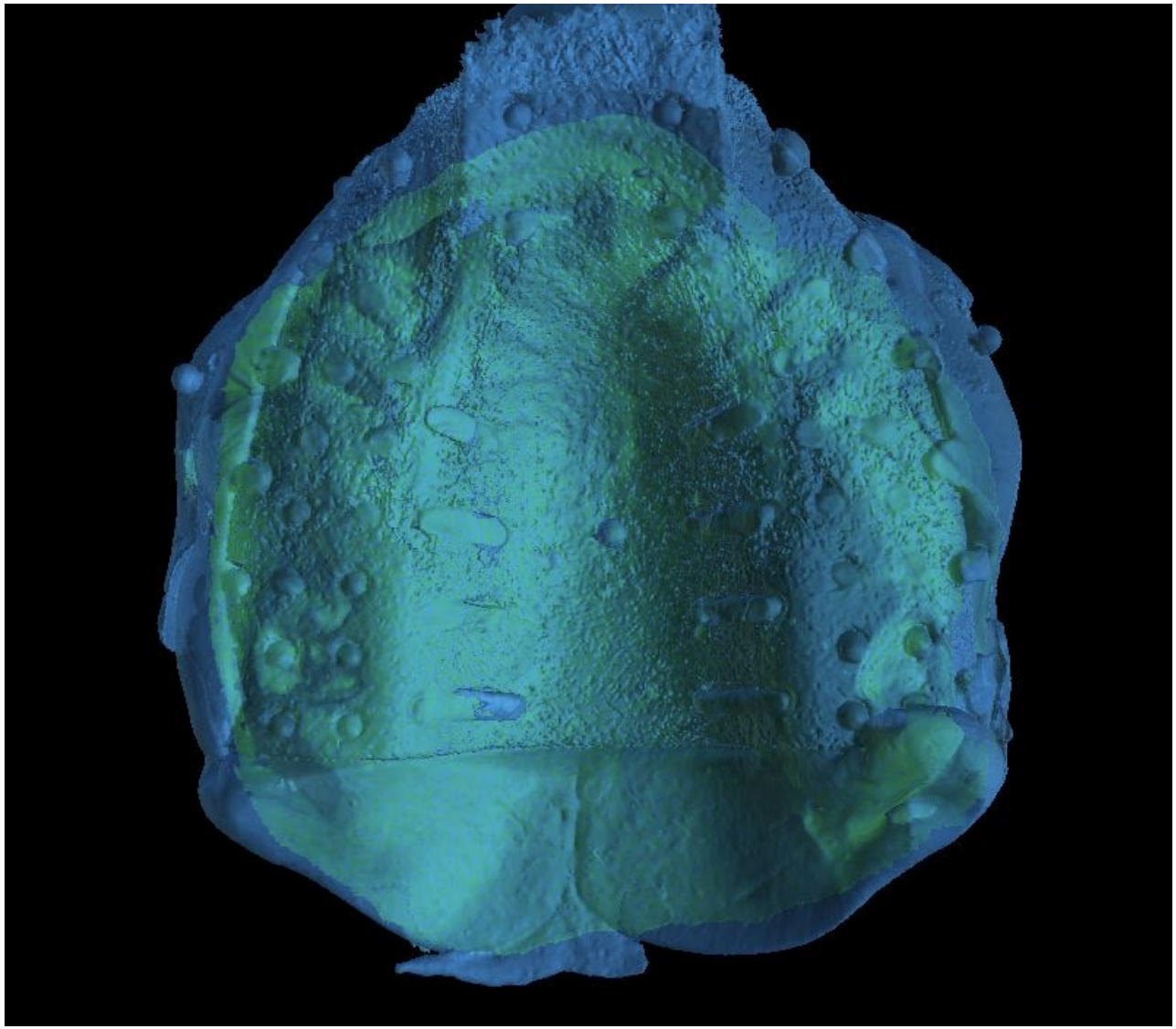
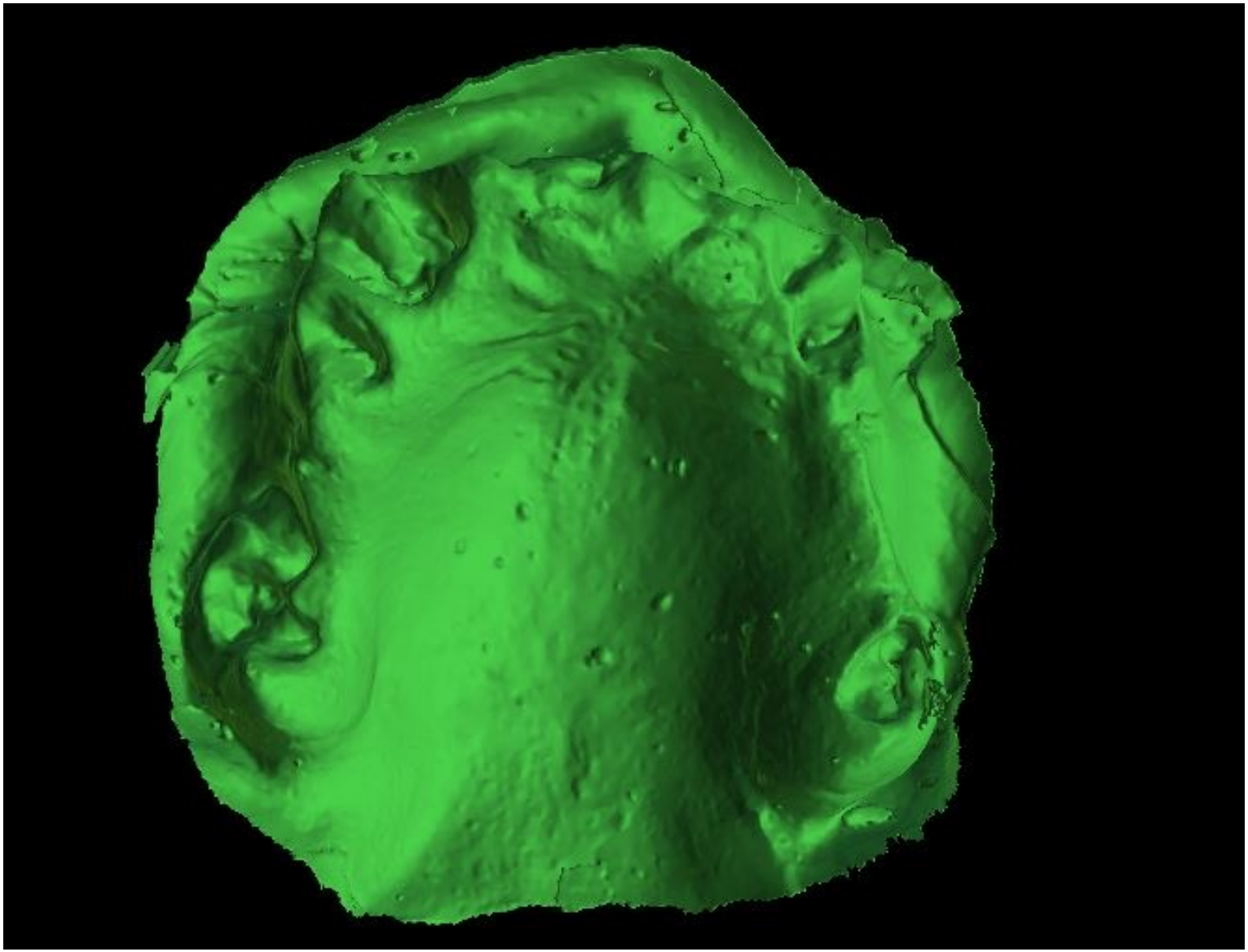


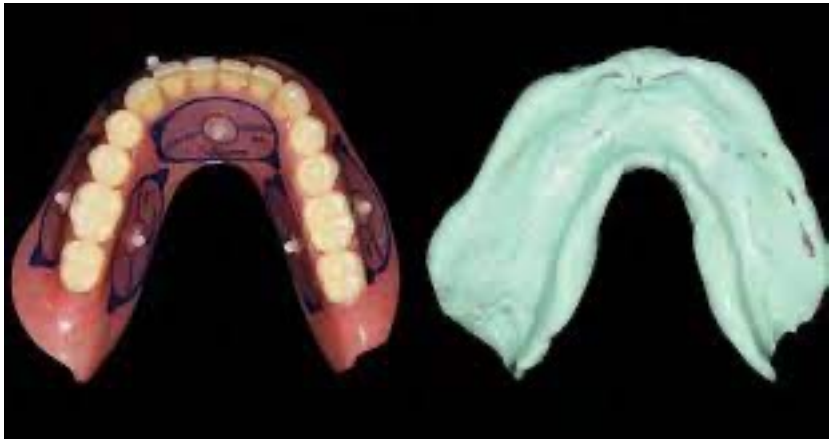
Introduction



Introduction

Data acquisition

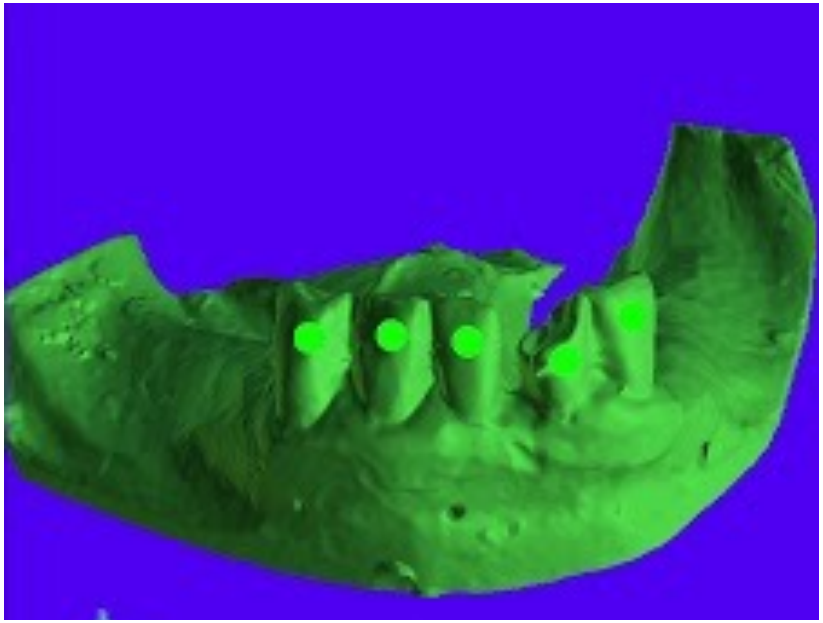
- **Denture**

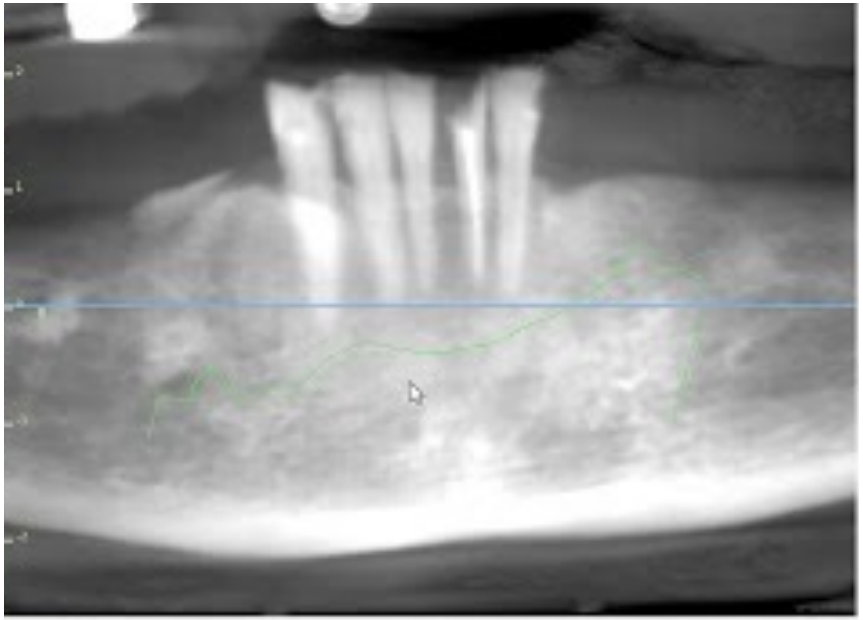


Introduction

Stitching

- CBCT to STL





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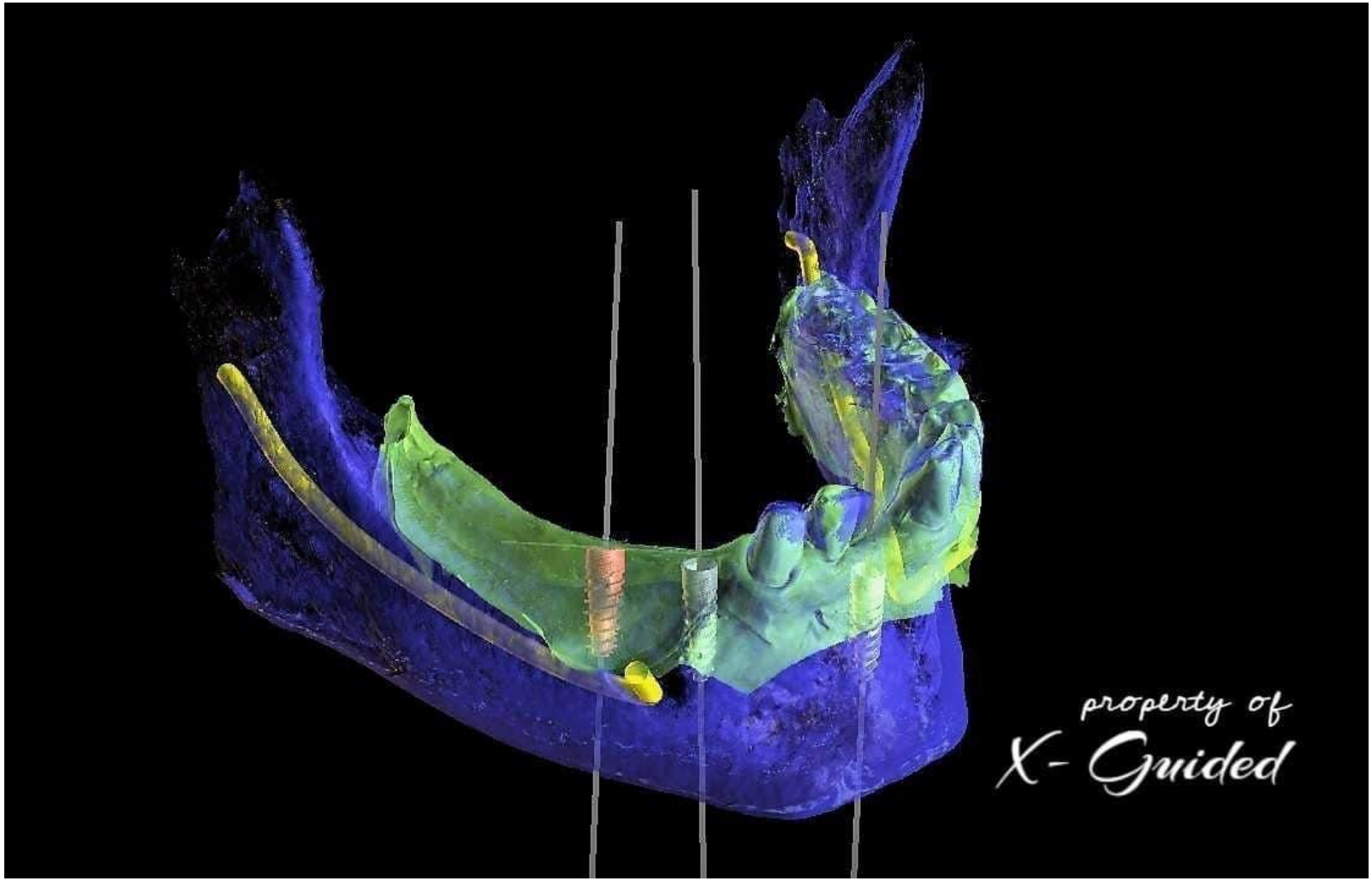
Stitching



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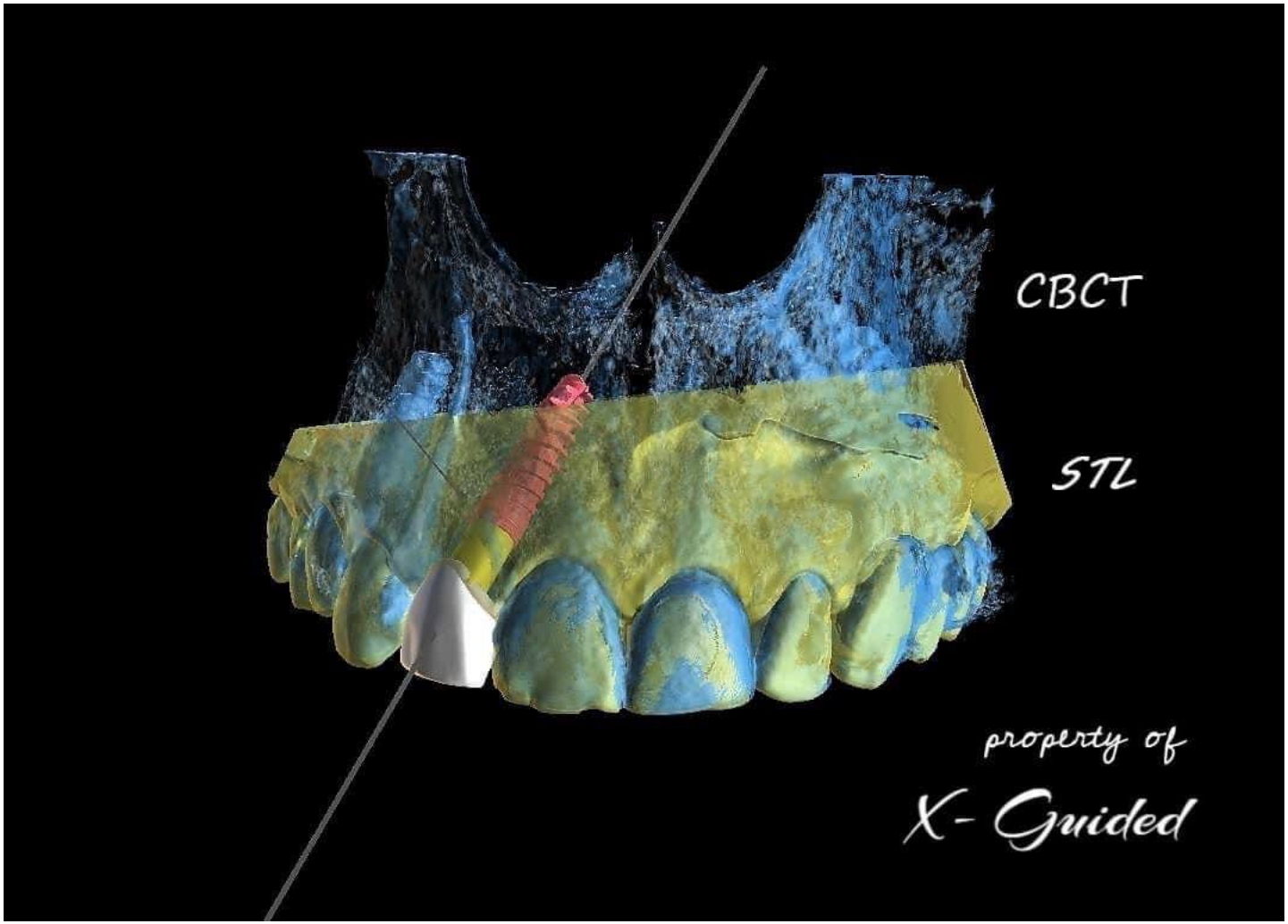
Stitching



Introduction

Guide fabrication

- Tooth-borne guides for dentate patients
- Tissue supported
- Bone-borne guides

Introduction

Guide fabrication

Tooth-borne guides for dentate patients

Introduction

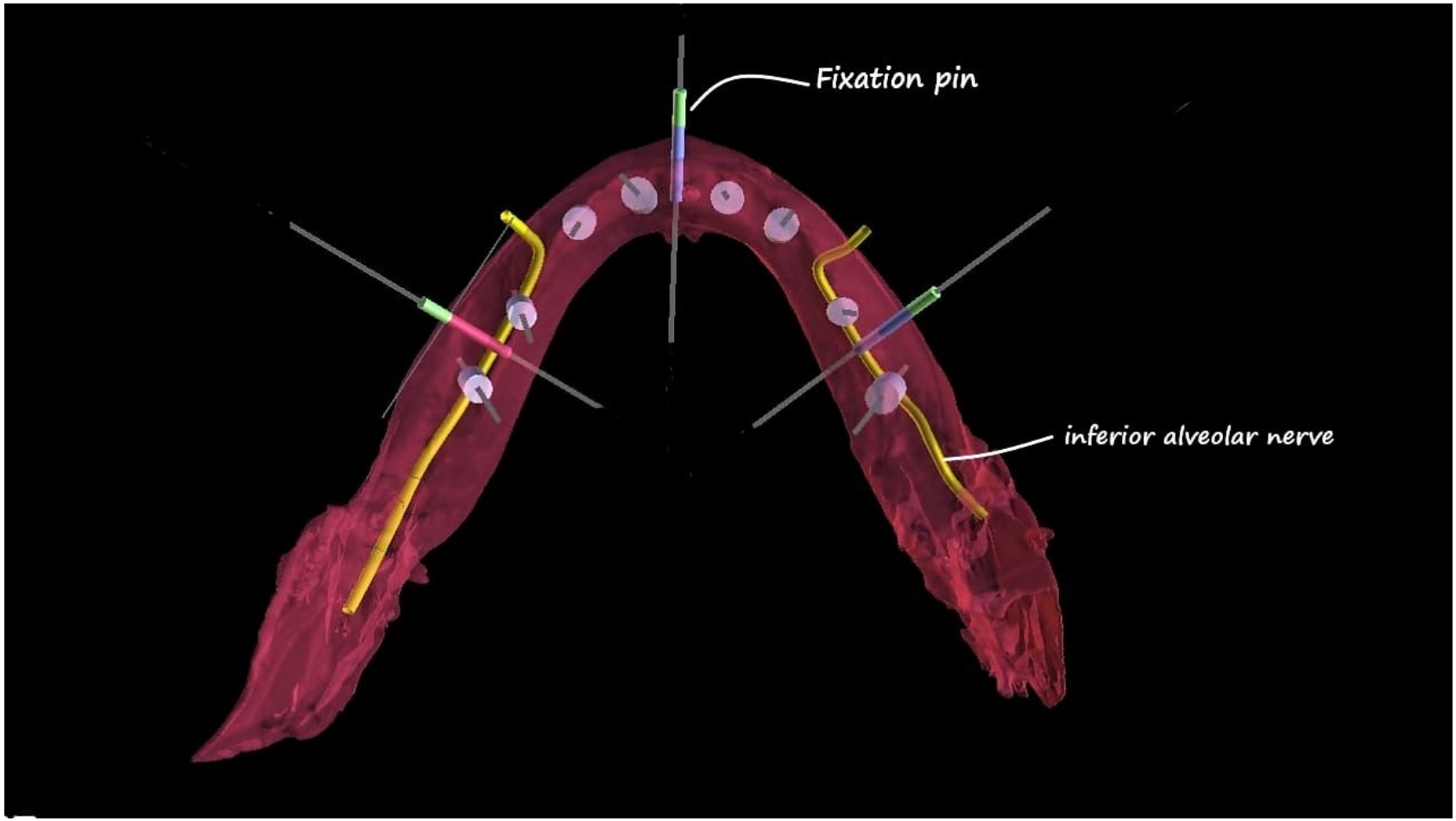
Guide fabrication

Tissue supported guide

Introduction

Guide fabrication

Tissue supported guide



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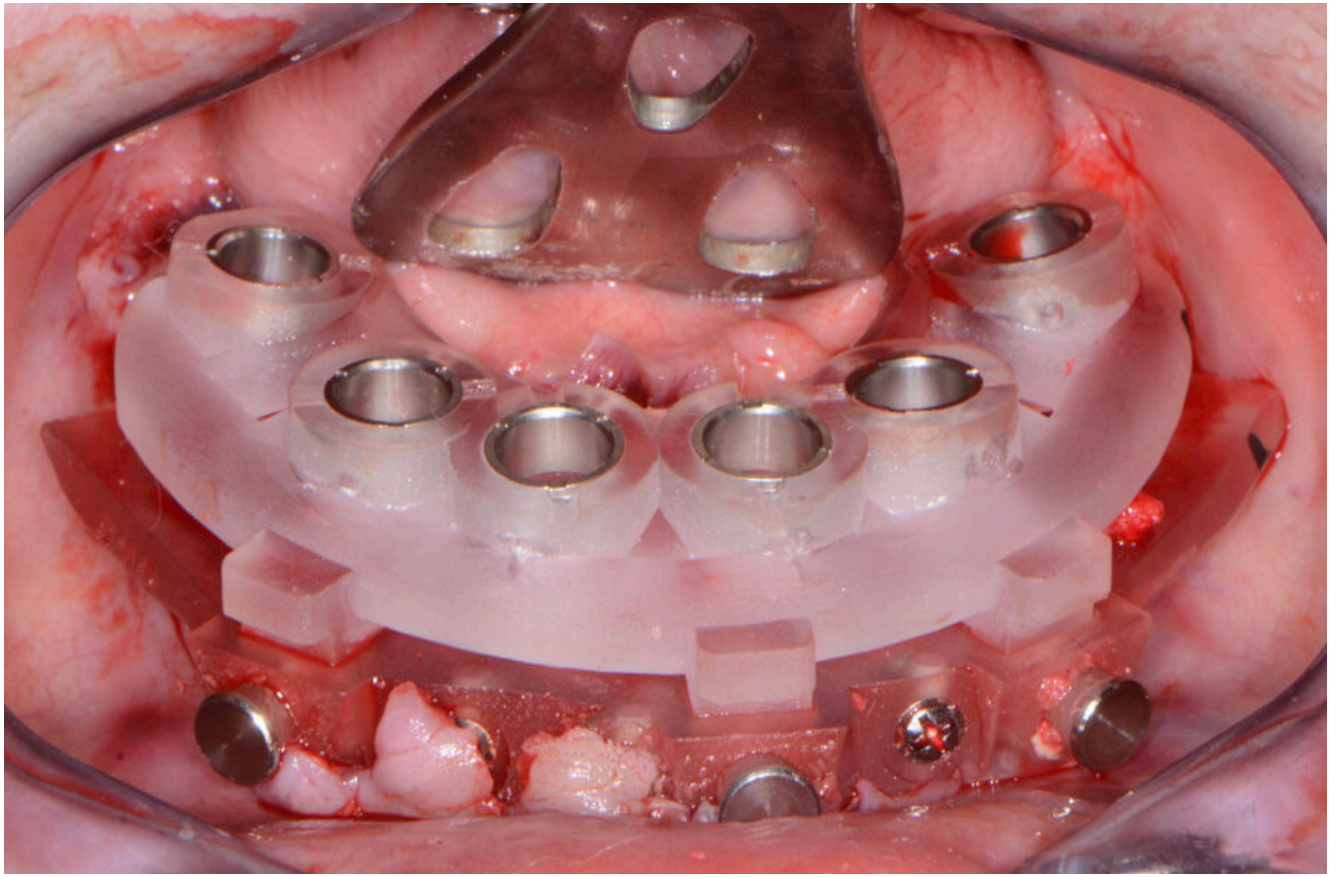
Guide fabrication

Tissue supported guide

Introduction

Guide fabrication

Bone supported guide



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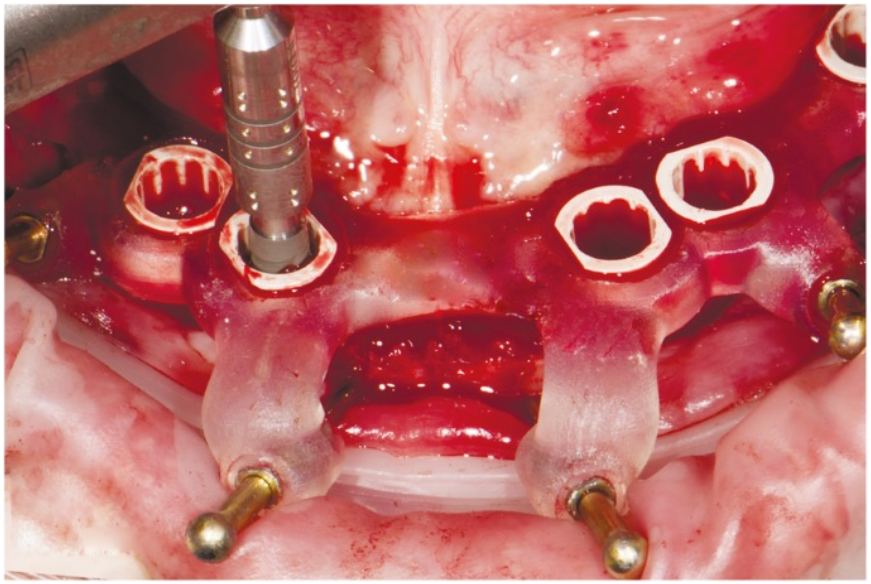
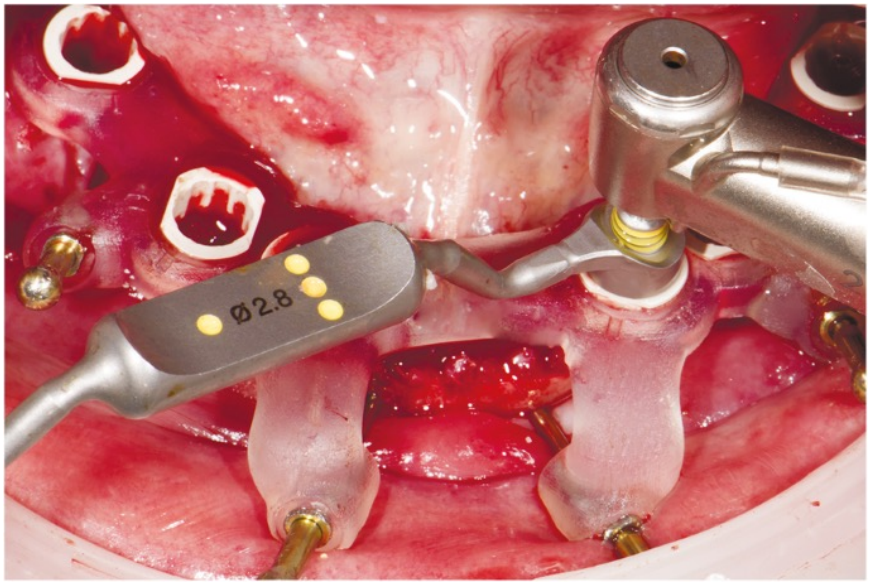
Guide fabrication

Bone supported guide





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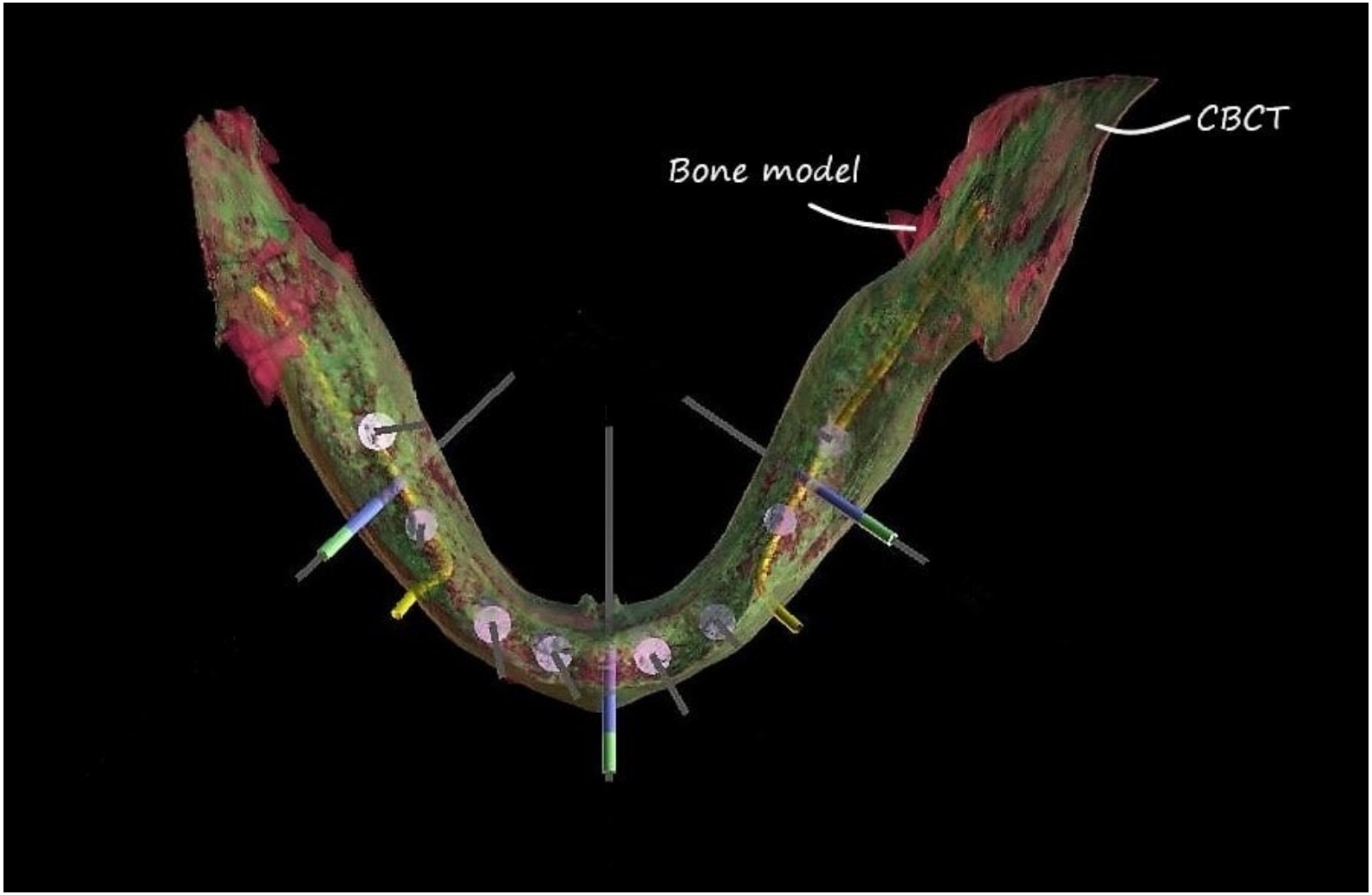
Guide fabrication

Bone supported guide



Dynamic navigation-guided surgery systems

X-NAV