

Digital Designed Surgical Guide Aided Immediate Implant Placement: A Case Report

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ABSTRACT

To optimize the esthetic result in an upper maxillary incisor implant restoration, immediate implant placement post extraction was planned. The implant was placed in a flapless approach, with the aid of a digital designed surgical guide, to reduce post-operative inflammation and to obtain better esthetics. The application of guided surgery, even with only partial guidance, provided favorable orientation without full-thickness flap, and hence led to better preservation for both soft and bone tissue, guaranteed a more predictable esthetic result.

MATERIALS AND METHODS

In this case report, a surgical guide for the pilot drill was digitally designed and printed before the surgery for a 34 years old female, to carry out a micro-invasive surgery. After the micro-invasive extraction of a compromised root of the maxillary right middle incisor, the socket was then rinsed with abundant saline solution and prepared precisely orientated with the aid of the pilot drill guide, then a 13*3.5 mm NobelReplace® CC (Nobel Biocare) implant was immediately placed through a mucogingival approach. Bone substitutes and collagen membrane were simultaneously applied to fill the jumping gap and to compensate bone resorption after tooth extraction. After a healing period of 6 months, the implant was re-exposed and a screw-retained provisional restoration was delivered to shape the scalloped gingival contour. When the soft tissue contour reshaped stably 2 months later, an individual impression was obtained to manufacture the definitive restoration. Finally, a ceramic veneer was applied to the adjacent lateral incisor to correct its cone shaped crown.

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Initial

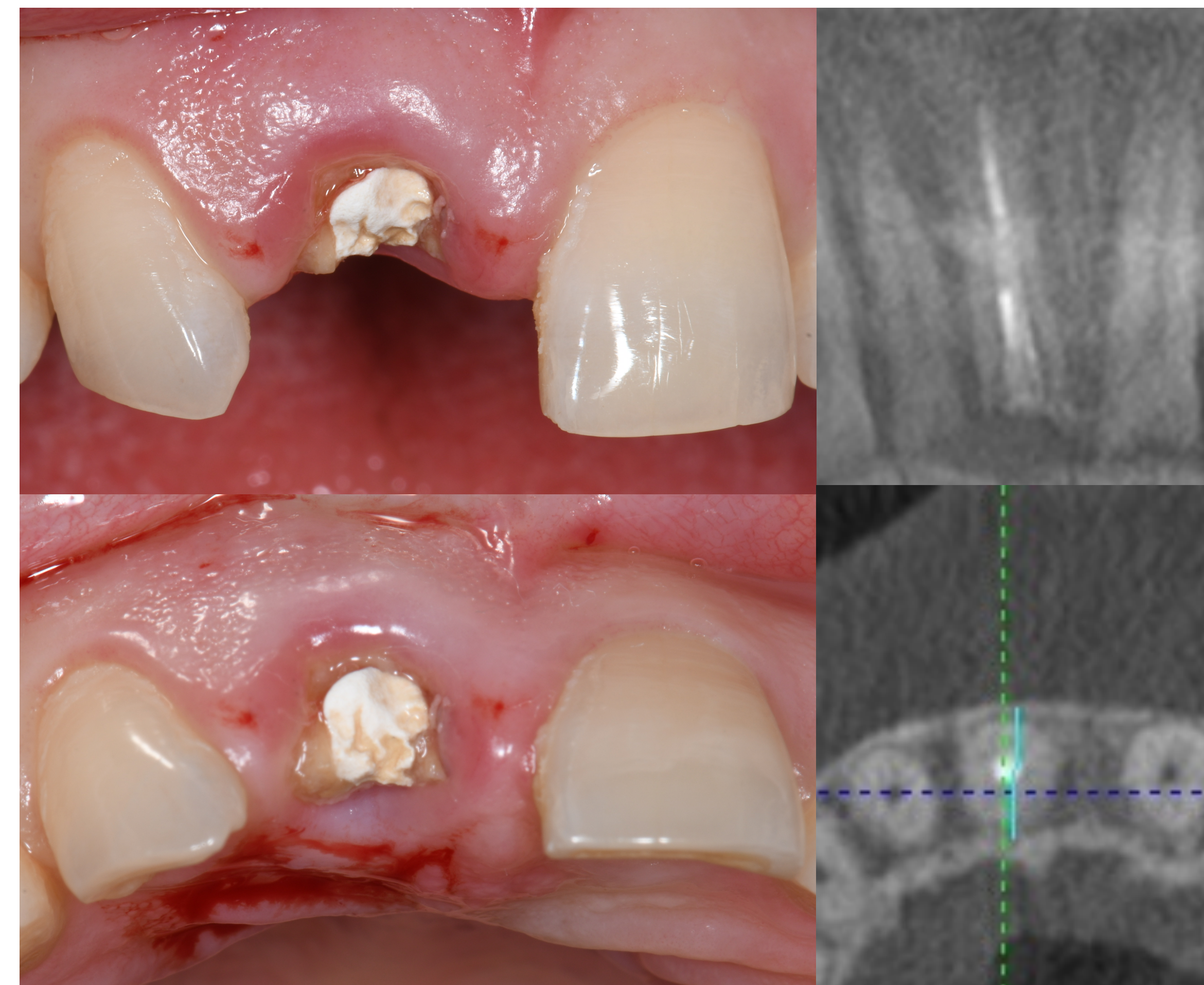


Fig 1

Digital design

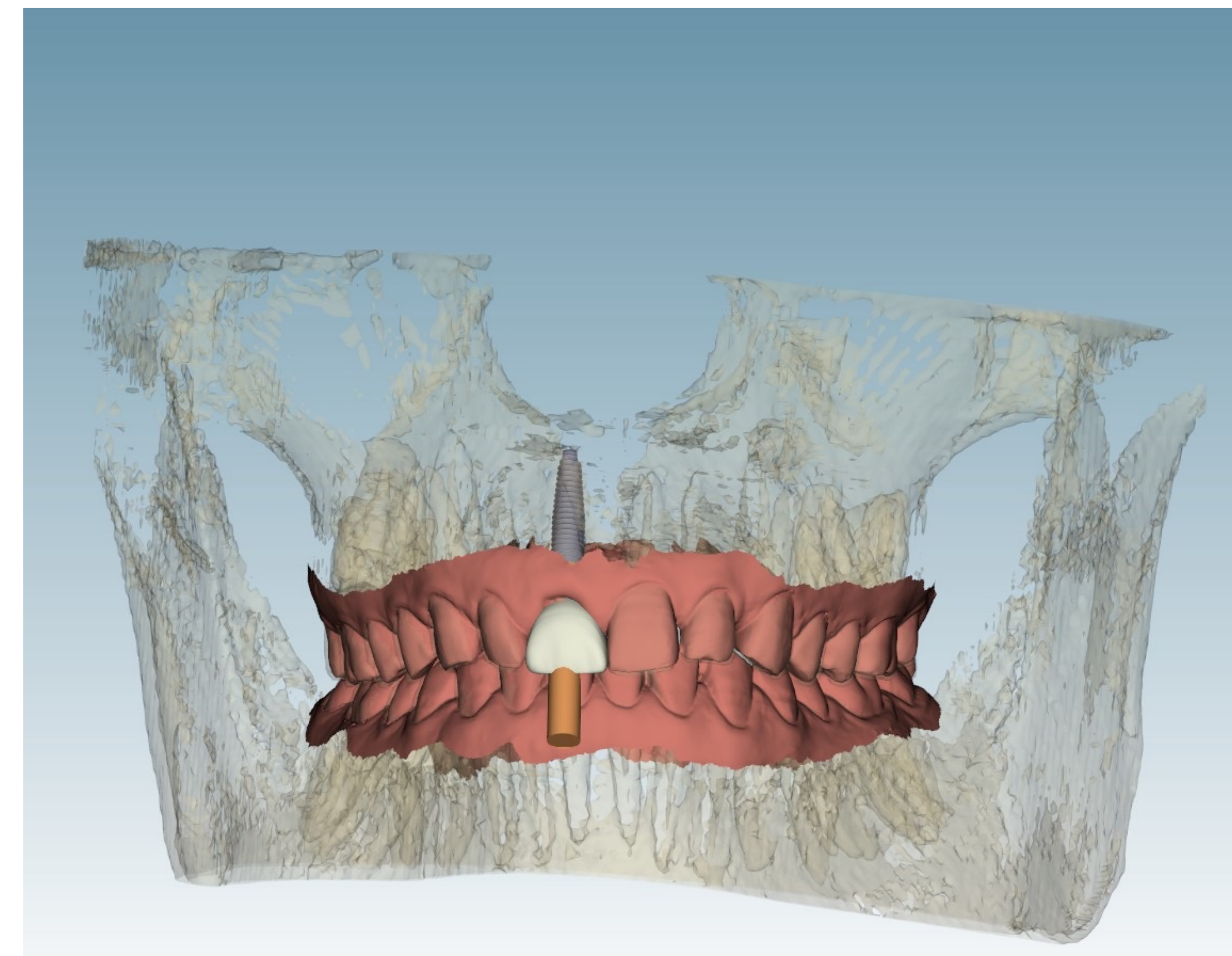


Fig 2

3D printed surgical guide



Fig 3

Surgical Procedure

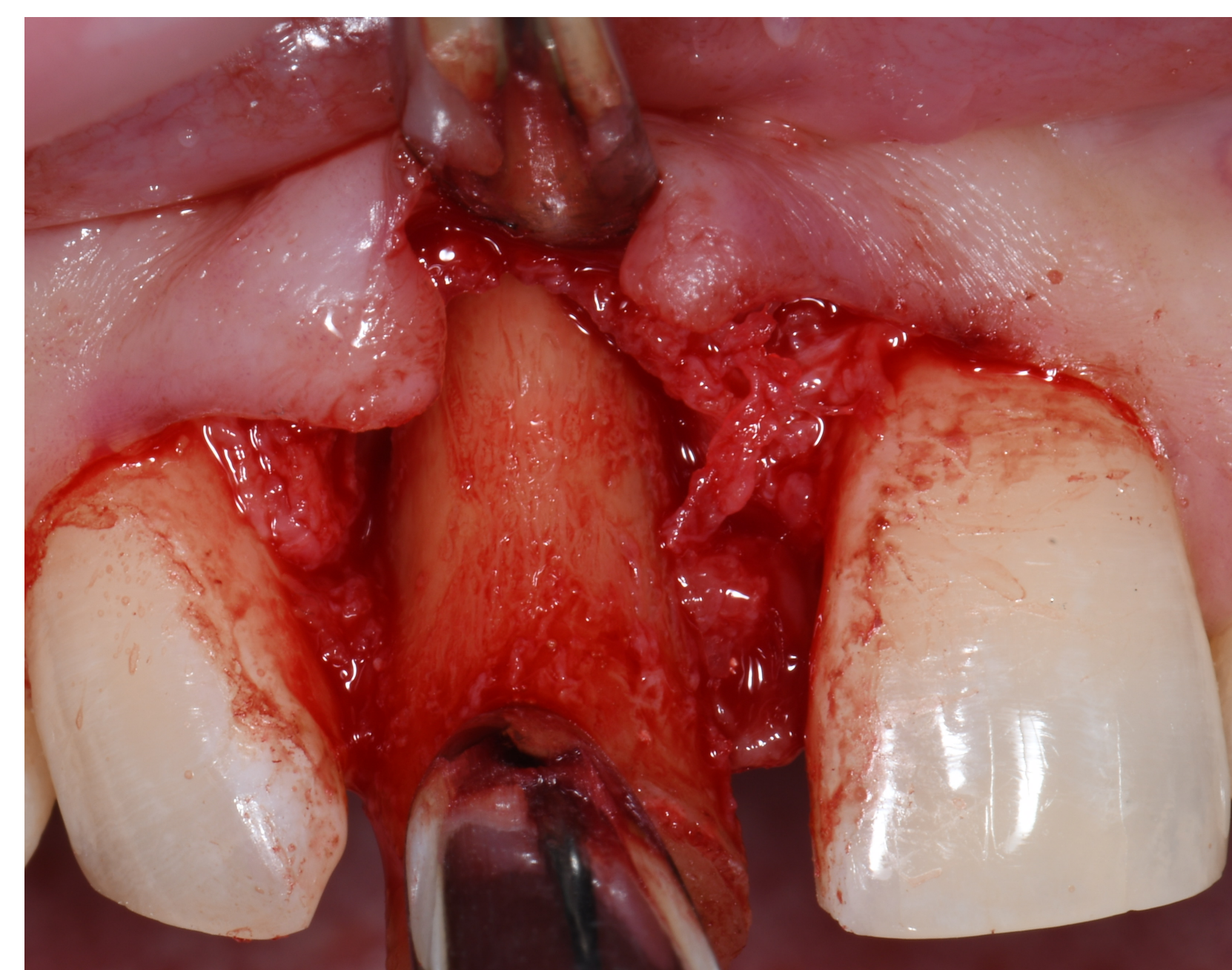


Fig 4 Tooth extraction

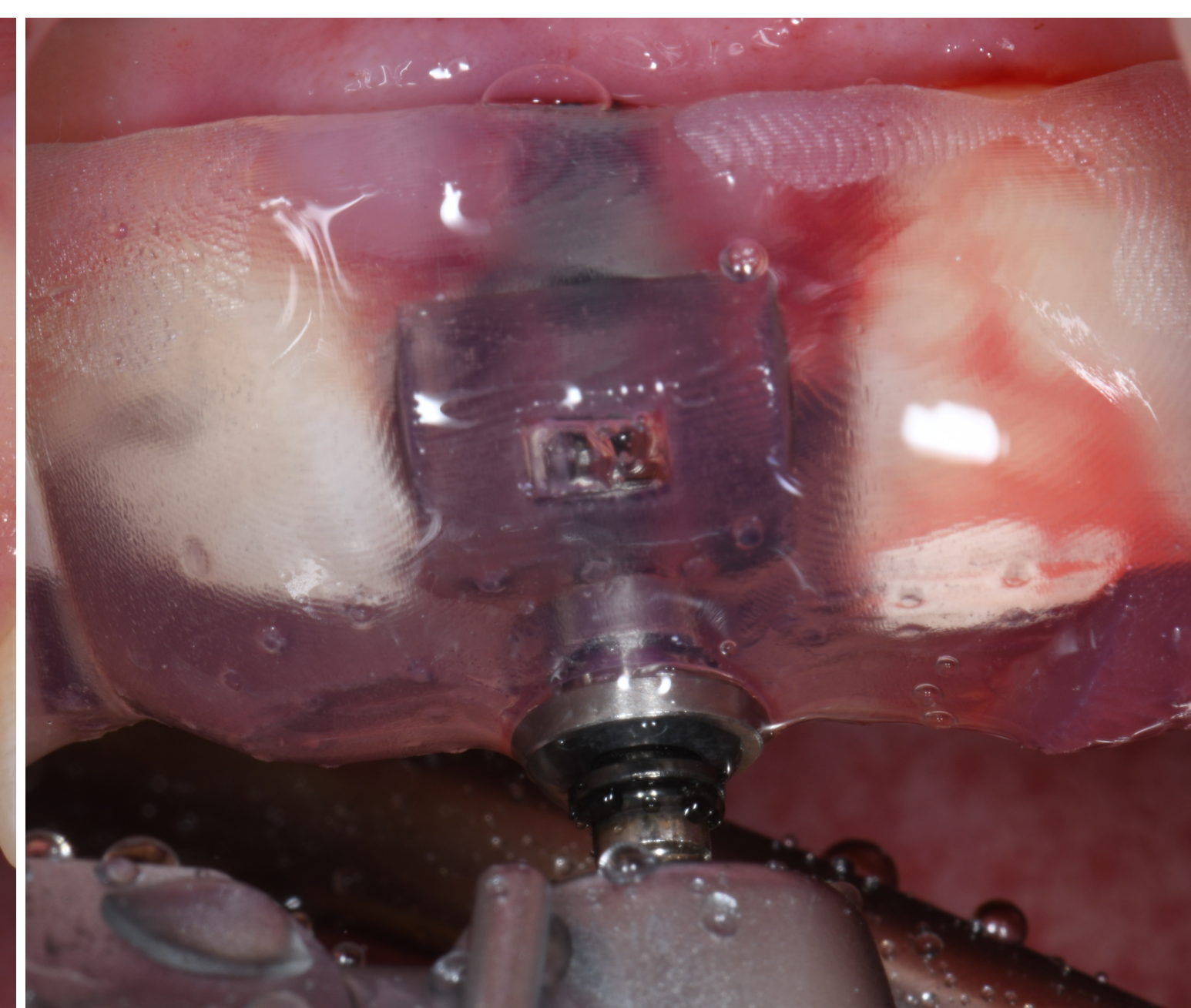


Fig 5 Guide-aided drilling

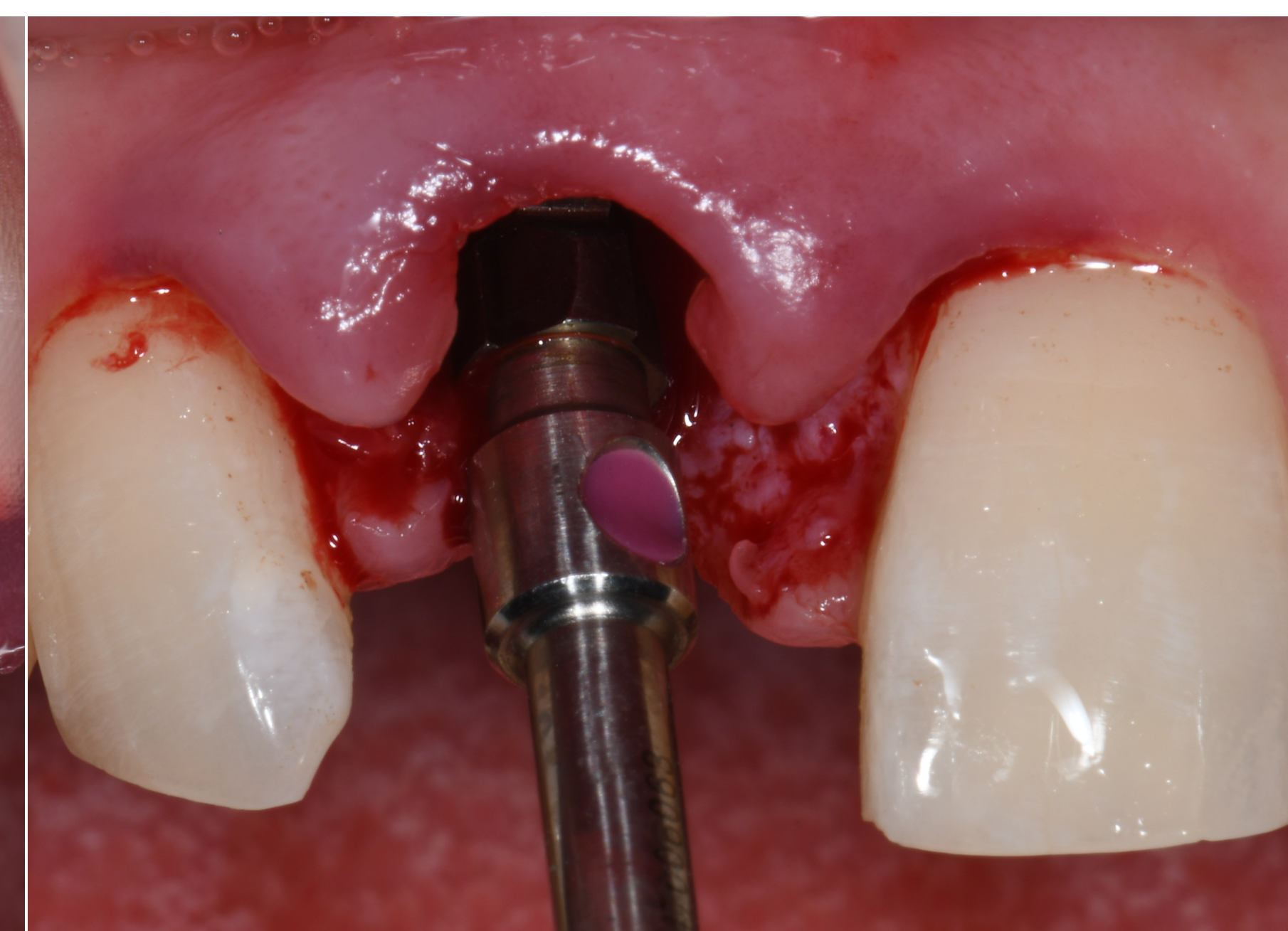


Fig 6 Preparation

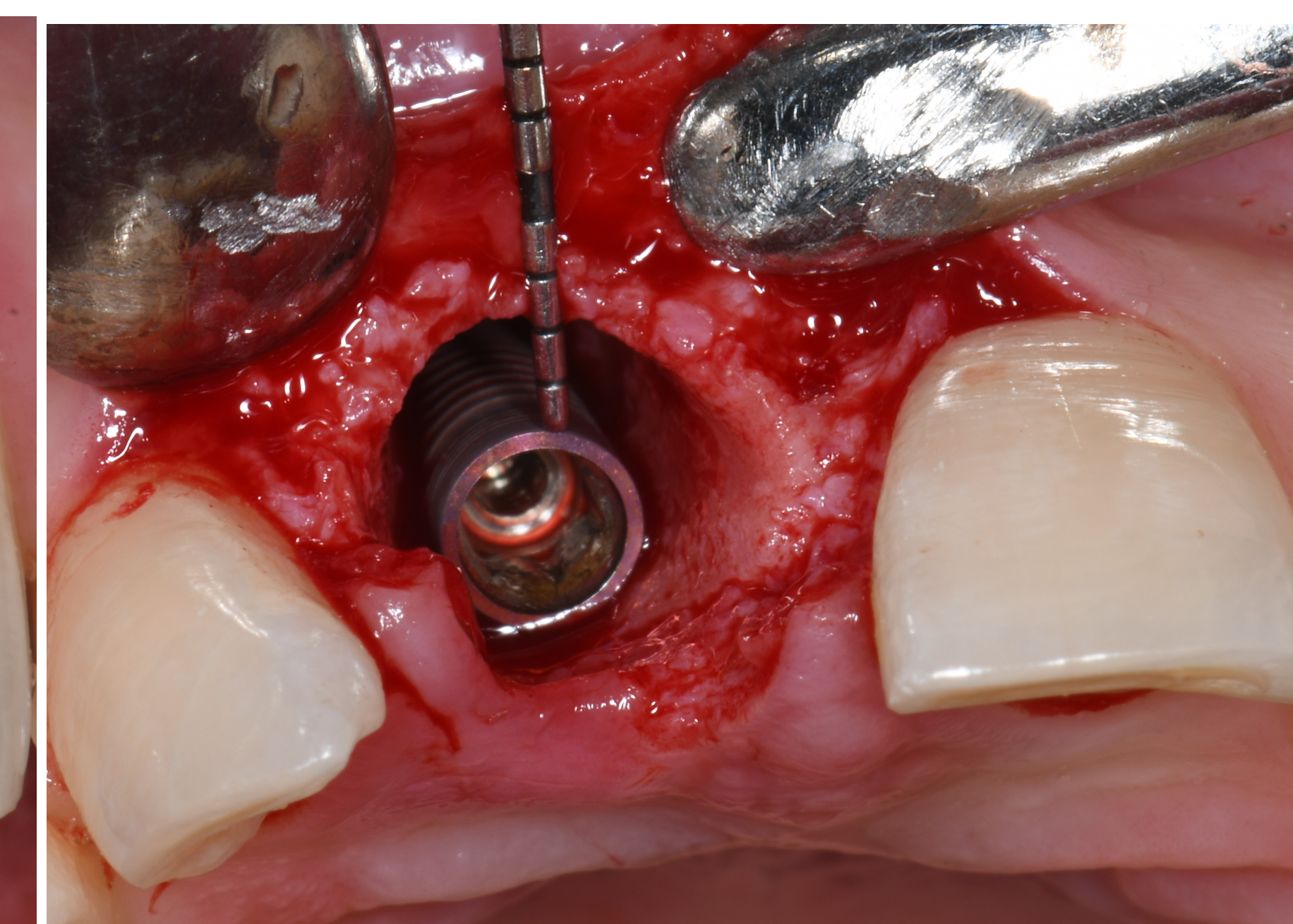


Fig 7 Implant placement

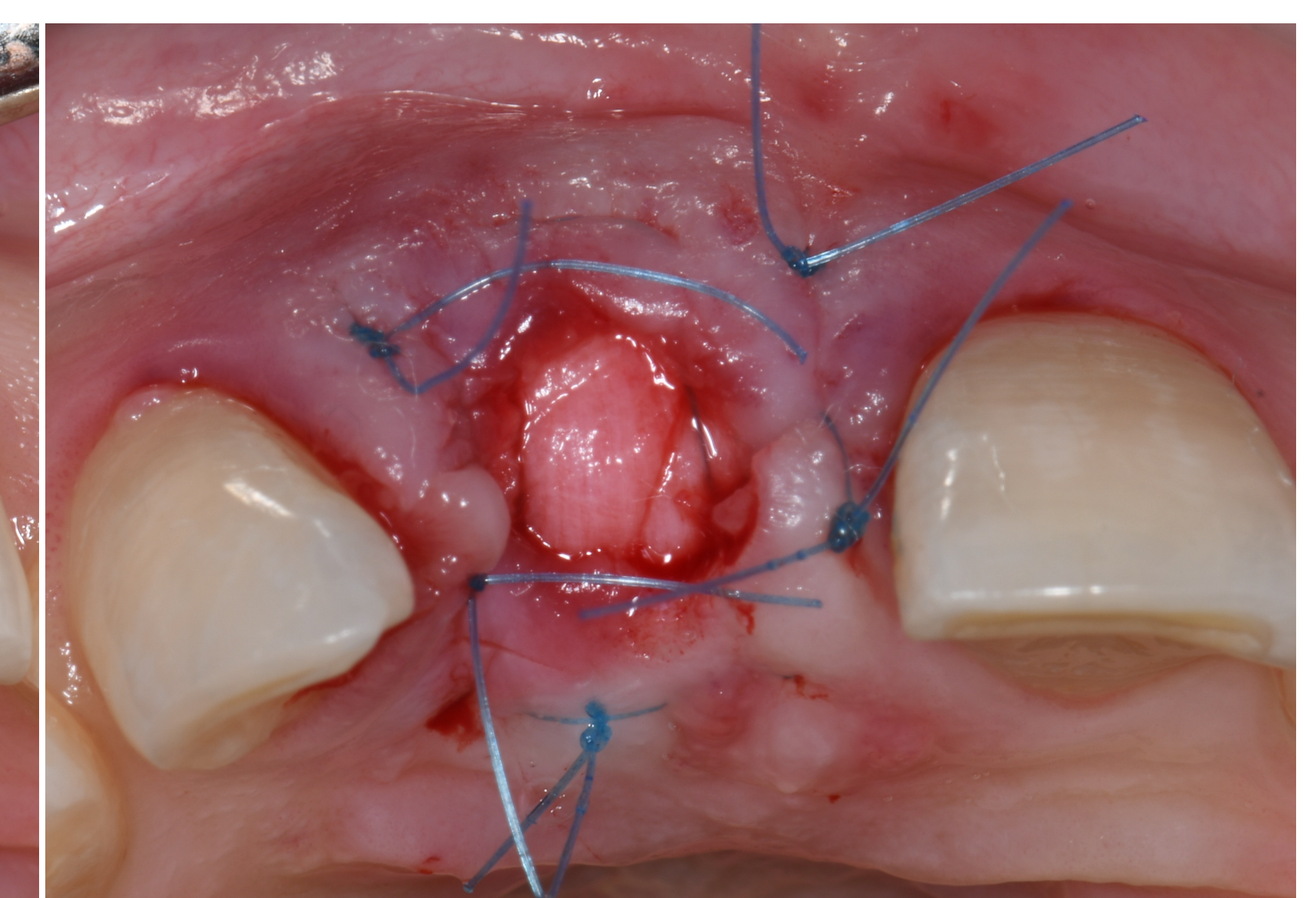


Fig 8 Wound closure

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Stage II

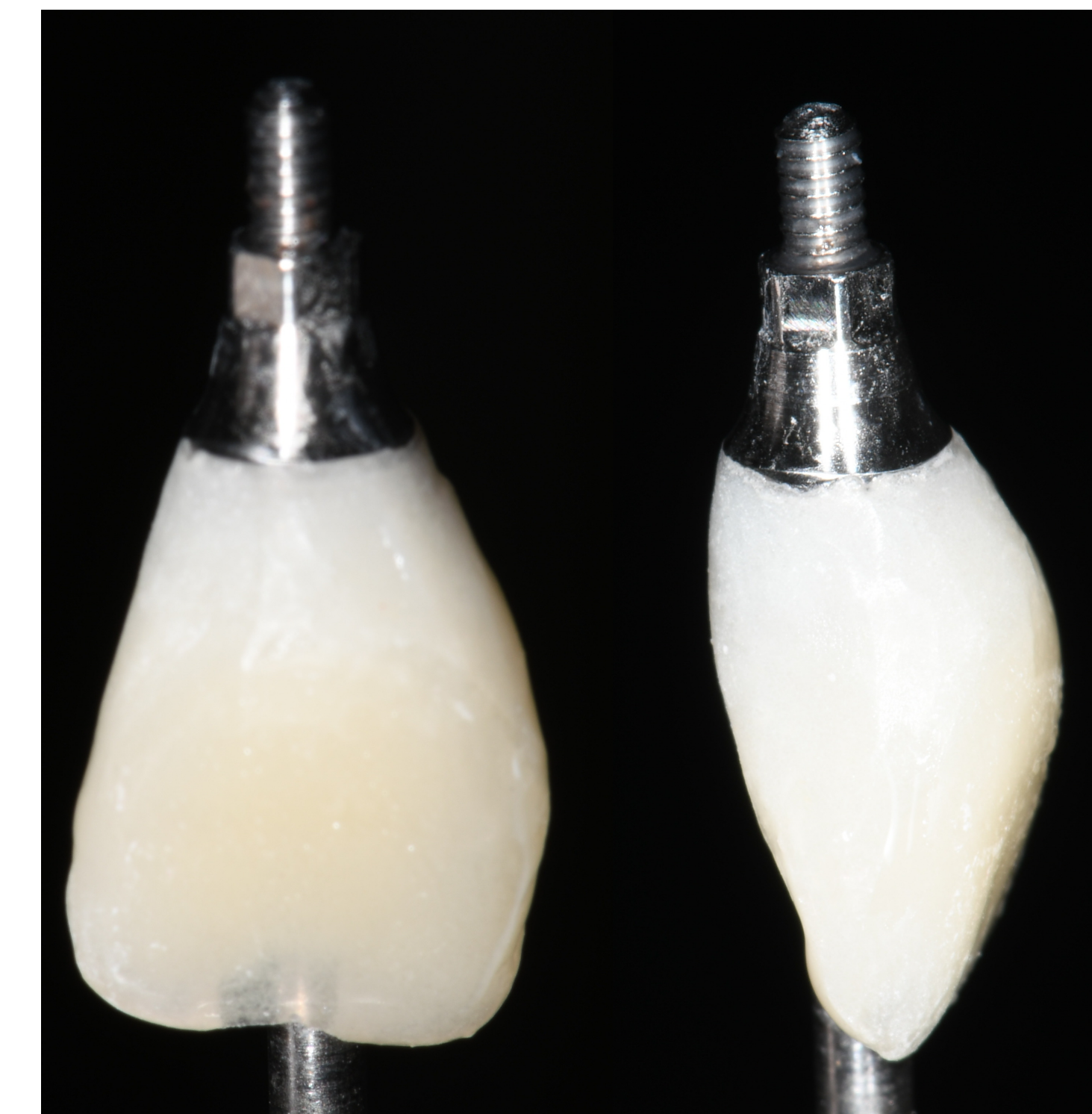


Fig 9 and 10 6 months post operation

Fig 11 and 12 Provisional restoration

Definitive Restoration



Fig 13 and 14 Gingival contour before definite impression

Fig 15 and 16 Delivery of definitive restoration

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Veneer



Fig 17 Panoramic photo after veneer



Fig 18-19 6 months after restoration

Advantages of Surgical Guide in Immediate Implant Placement

1. Precise orientation
2. Micro-invasive approach available, better tissue preservation

CONCLUSION

In immediate implant placement, especially in the aesthetic area, digitally designed surgical guide can be helpful to achieve micro-invasiveness and predictable esthetic result.

REFERENCES

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2. Martina Stefanini, Alexandra Rendón, Alessandro Zucchelli, Matteo Sangiorgi, Giovanni Zucchelli Avoiding errors and complications related to immediate implant placement in the esthetic area with a mucogingival approach. Periodontol 2000. 2023 Jun;92(1):362-372.