

Prosthetically Driven Implant Placement and Prosthodontic Treatment Using Dynamic Navigation

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A 40 year old patient requiring 6 implants in the maxilla had non-restorable maxillary teeth with root caries and generalized periodontitis grade IV stage B. Patient had a reverse smile line with supra-eruption of teeth #4,5,12,13. Patient was treatment planned for extraction of remaining maxillary teeth, implant placement #3,5,7,10,12,14. In the mandible, implants #18,19,30 were planned to provide posterior support. Following obtaining diagnostic criteria including CBCT, photos, and diagnostic casts, a prosthetically designed stackable guide for dynamic navigation system was used to place dental implants, perform alveoloplasty, and load the provisional.

Pre-Treatment



Fig. 1 Chief complaint: "I want to be able to chew and smile again"



Fig. 2 Occlusal view of the maxillary arch.



Fig. 3 Missing teeth, irregular occlusal plane, & decay.

Treatment Planning

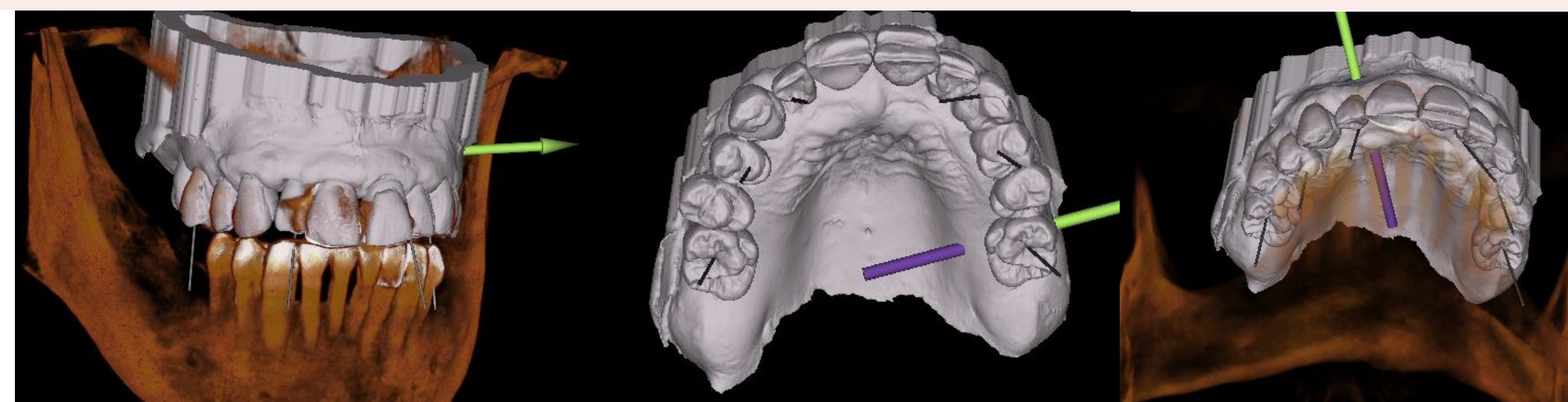


Fig. 4 Virtual wax up was performed using Exocad. Wax up was merged to pre-op scan and CBCT. All-on-6 implant planning using X-Guide software was performed based on the wax up.

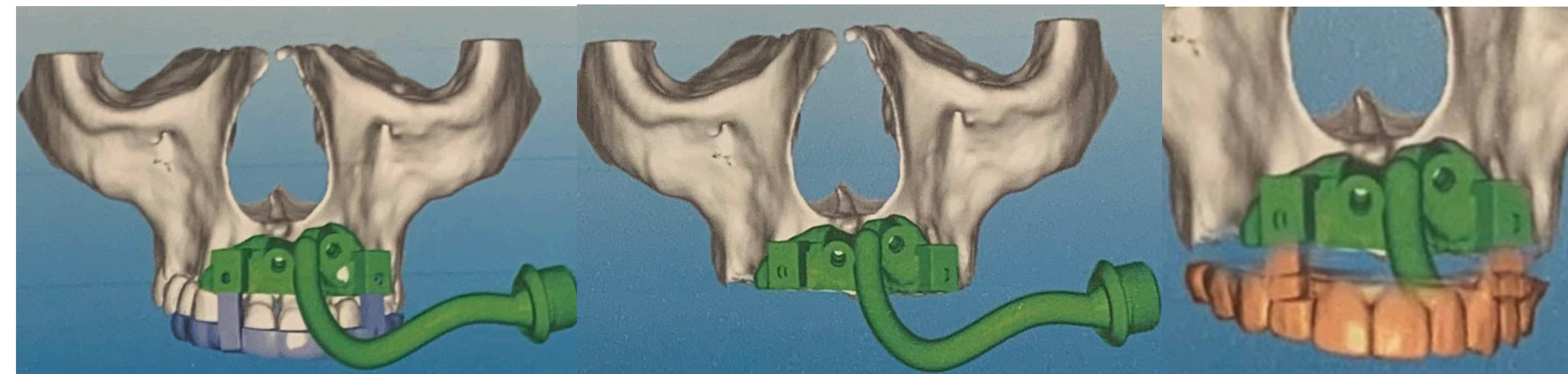


Fig. 5 A **tooth-borne occlusal jig** is used to position and place the **foundation guide**. Once the **foundation guide** is fixated, it will hold the patient X-nav tracker bulb and the **provisional prosthesis** after implant placement.

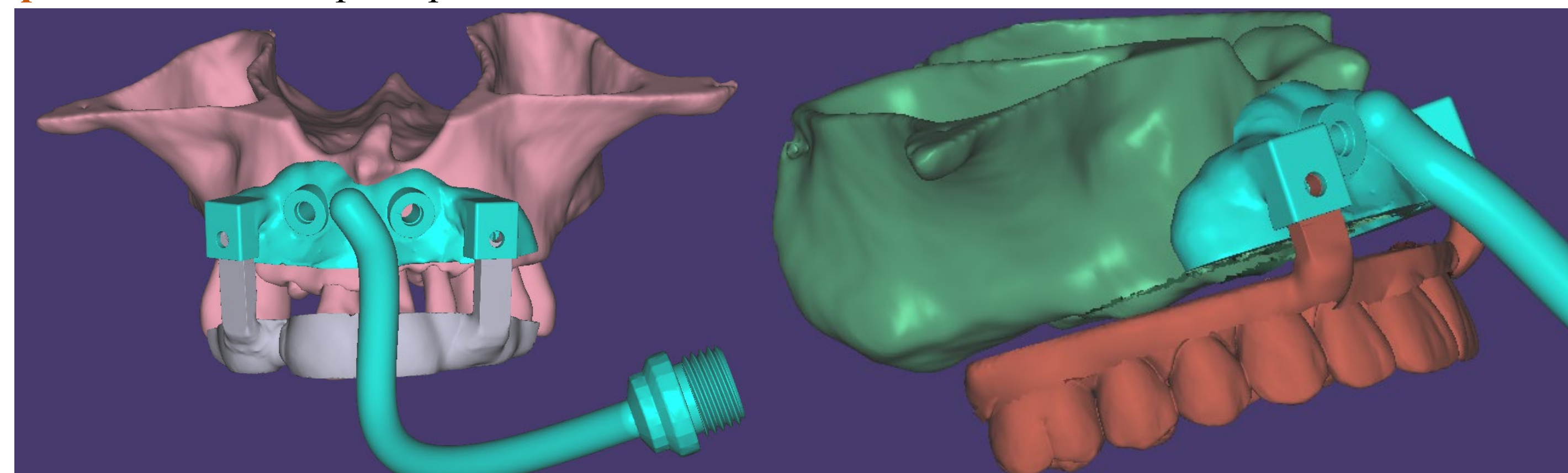


Fig. 6 Design of stackable guide and provisional prosthesis.

Surgery

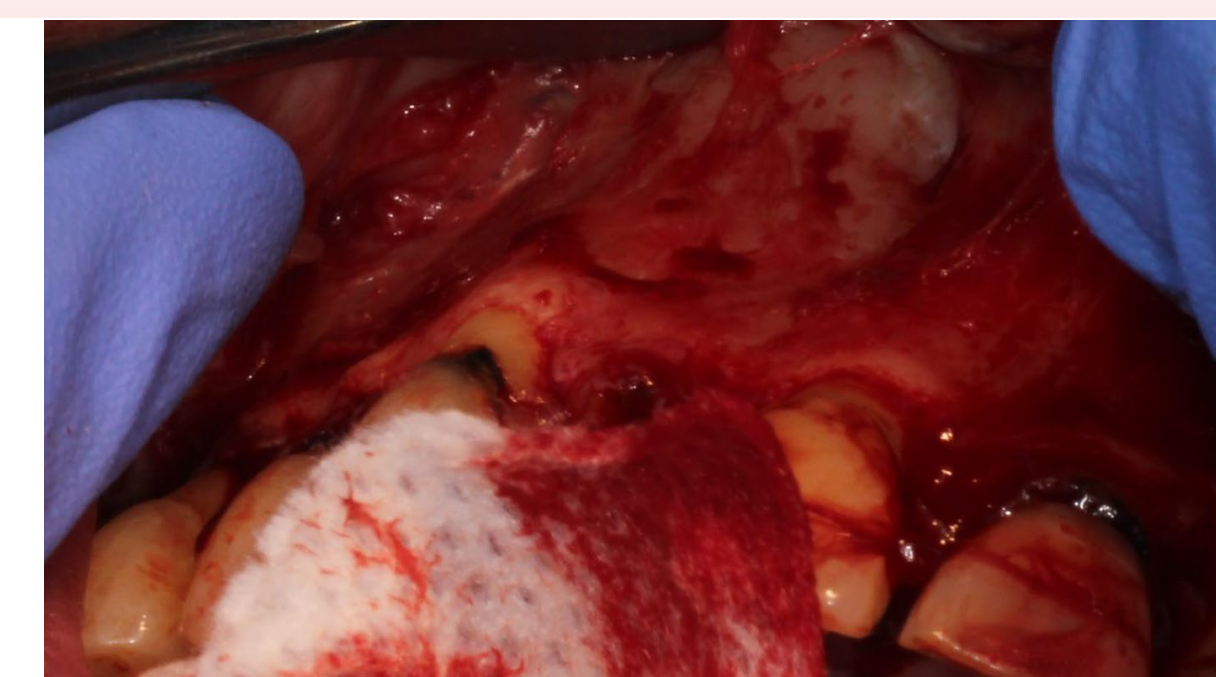


Fig. 7 A mucoperiosteal flap is reflected.

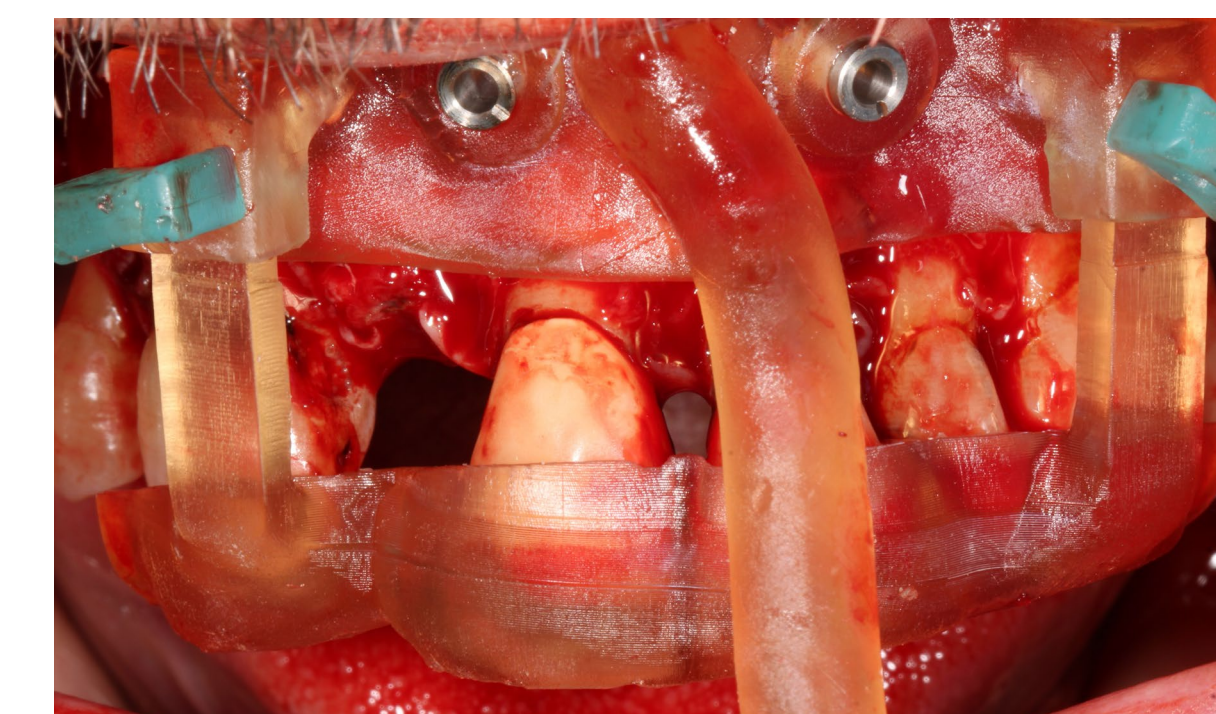


Fig. 8 A tooth-borne occlusal jig is used to position and place the foundation guide. The foundation guide is fixated.



Fig. 9 The occlusal jig is removed. The X-nav tracker bulb is connected to the foundation guide. System is calibrated with X-mark protocol.

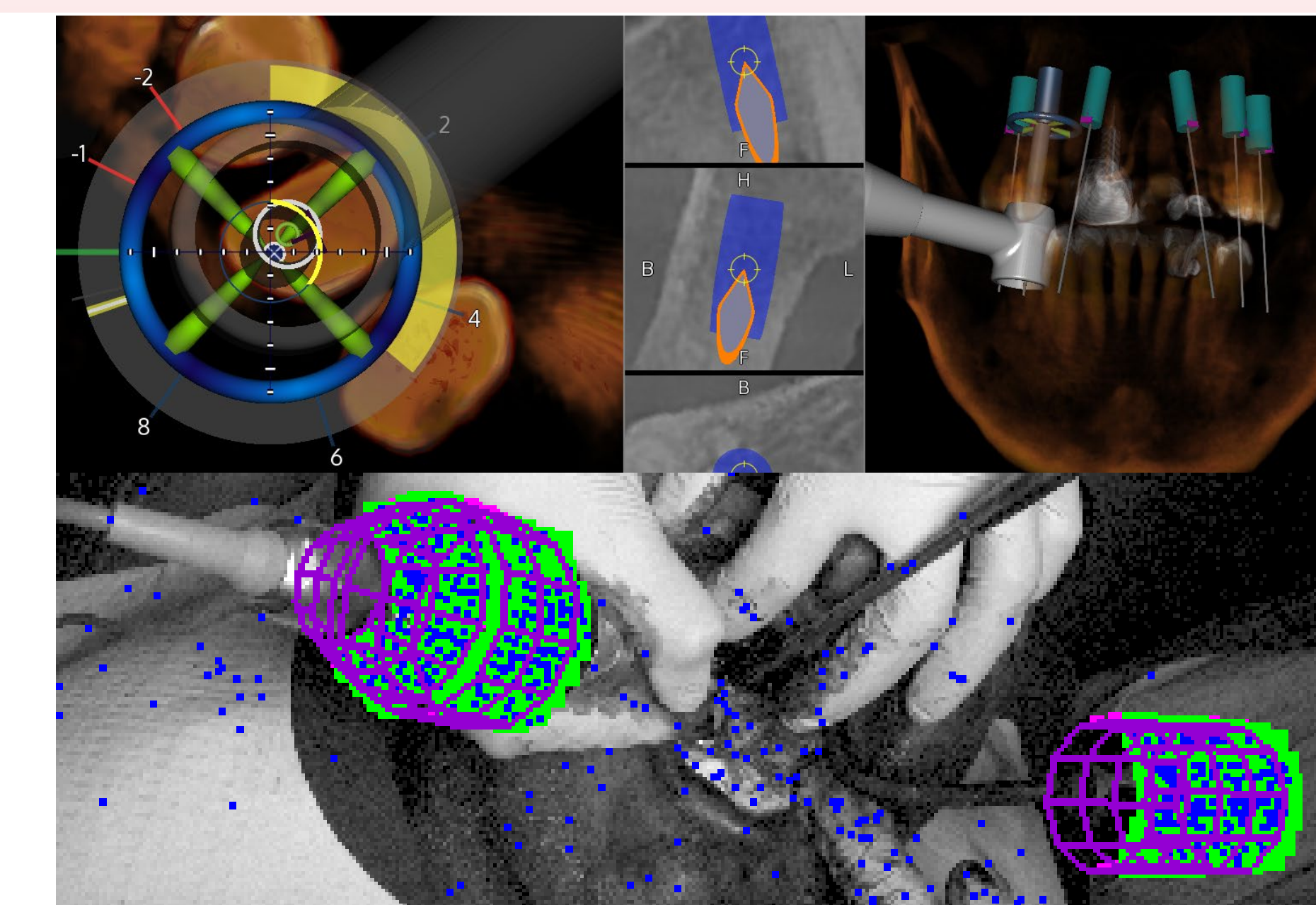


Fig. 10 X-nav screen during dynamic guided osteotomy site preparation.

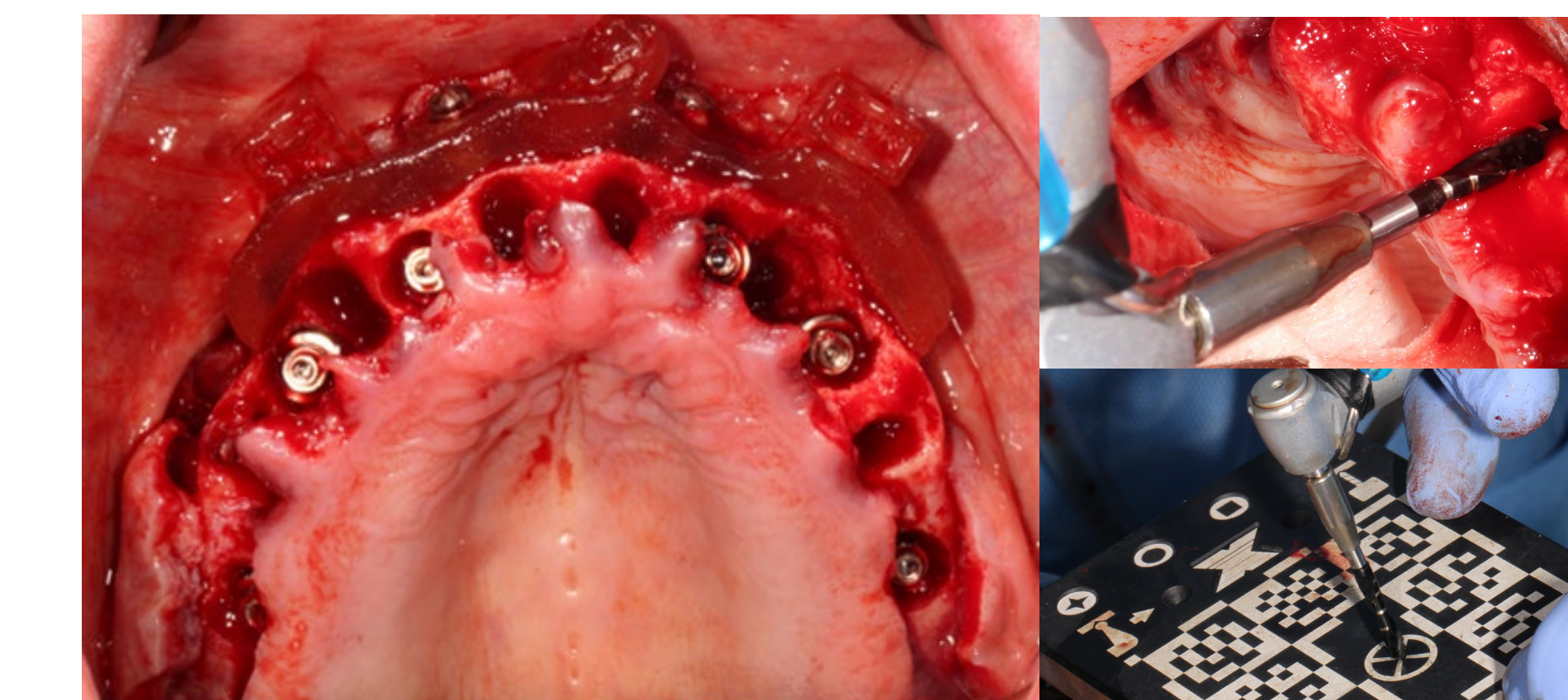


Fig. 11 Extractions, calibration of each drill, osteotomy site preparations. Static tracker arm removed from the foundation guide with a bur. Cover screws are placed and alveoloplasty is performed. Multi-unit abutments are placed.

Immediate Provisionalization

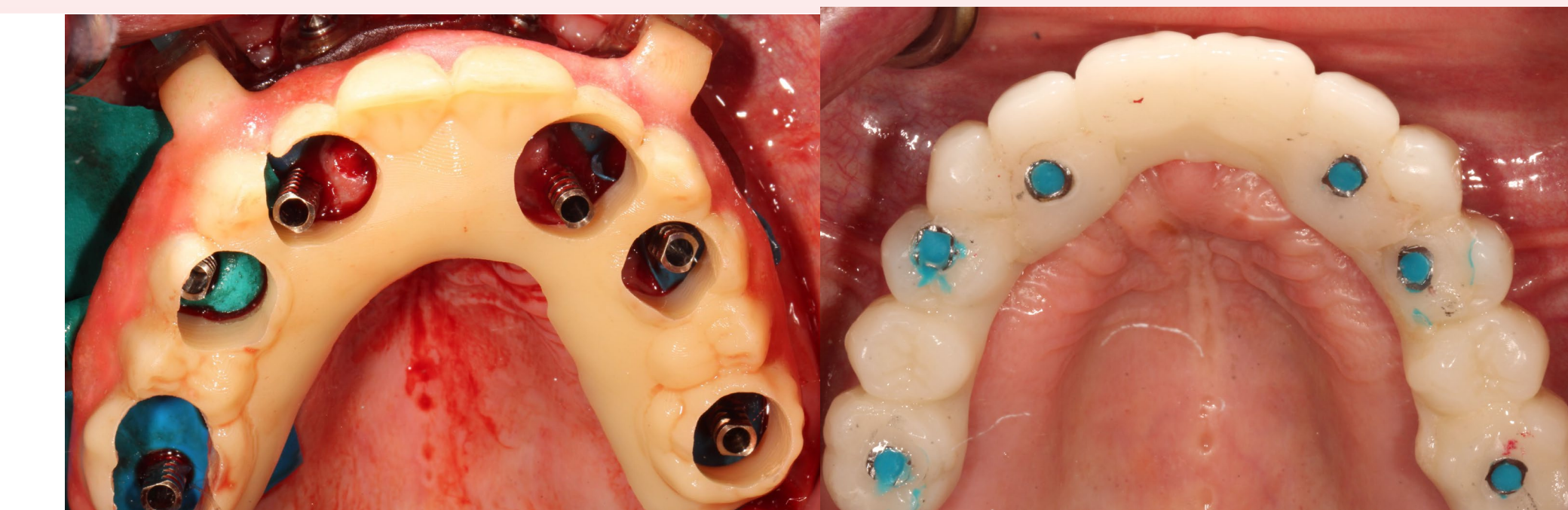


Fig. 12 Temporary abutments are placed. Prosthesis is seated into the foundation guide. Picked up using PMMA. Prosthesis is disconnected from foundation guide, polished, and finished while the foundation prosthesis is removed and flap is closed.



Fig. 13 The prosthesis is immediately delivered and the patient is allowed to heal for 4 months with no significant events.

Summary The present report followed a calibration technique that precludes the use of an x-clip. X-nav dynamic guidance can be used in full arch implant cases including treatments that require bone reduction prior to implant placement.