CASE 4

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CORRECT 3D IMPLANT PLACEMENT

PROSTHETICALLY GUIDED BONE REGENERATION

SOCKET/RIDGE PRESERVATION

HORIZONTAL GBR

Vertical GBR

Connective tissue graft

Standard loading

Delayed loading

IMMEDIATE LOADING

CUSTOM PROSTHETIC EMERGENCE PROFILE

Cemented retention

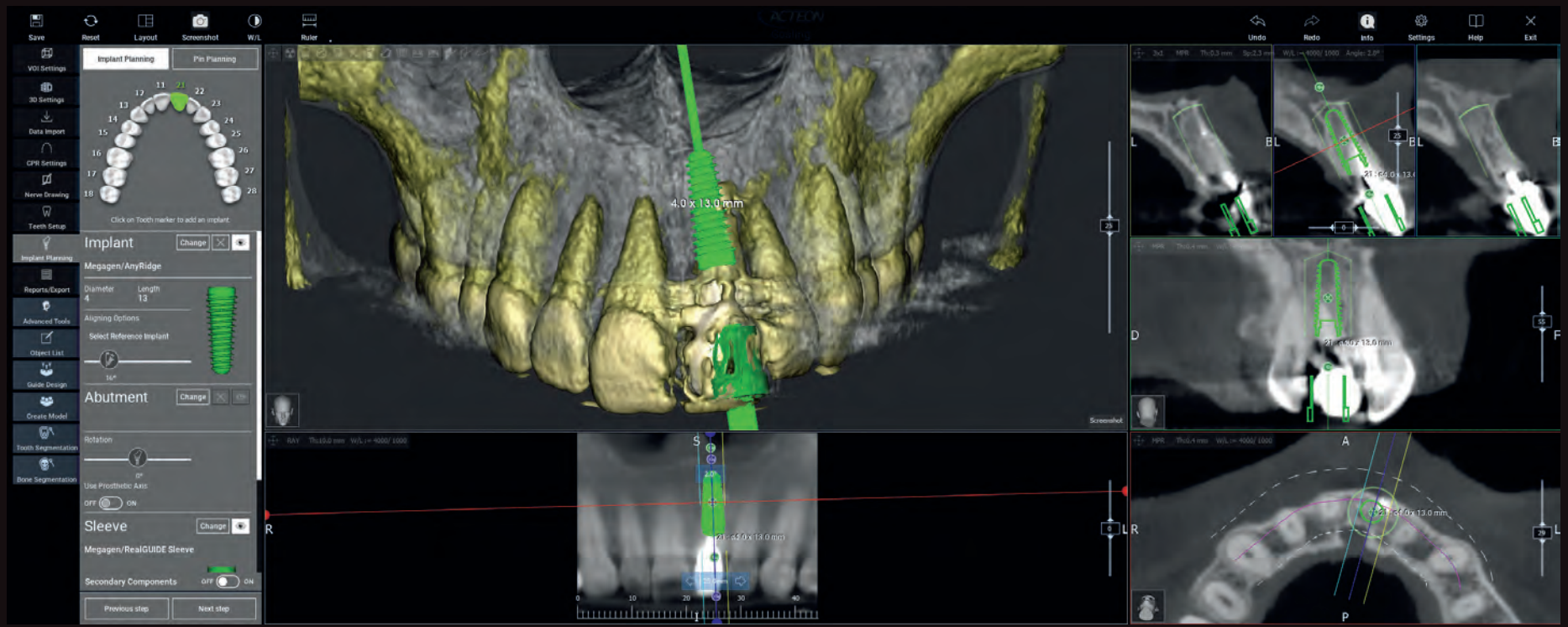
SCREW-RETAINED CROWNS

Adhesive prosthesis

HIGH ESTHETIC RISK

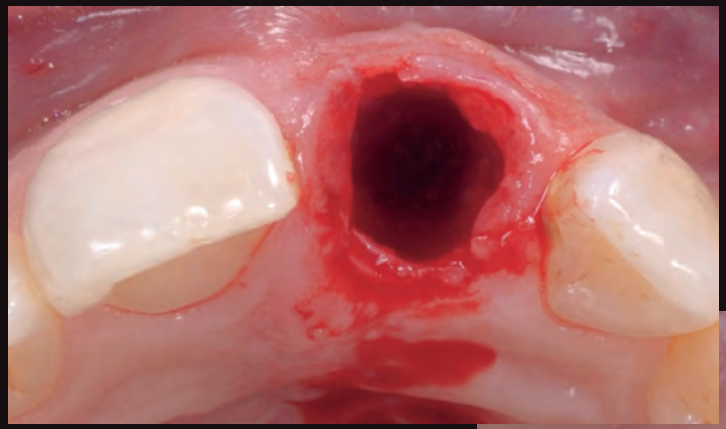
Initial situation: labial view, patient with high risk esthetic profile wants solution for upper central incisor (21). Patient reports that this tooth has been treated several times in the past, causing apprehension for possibly further treatments.

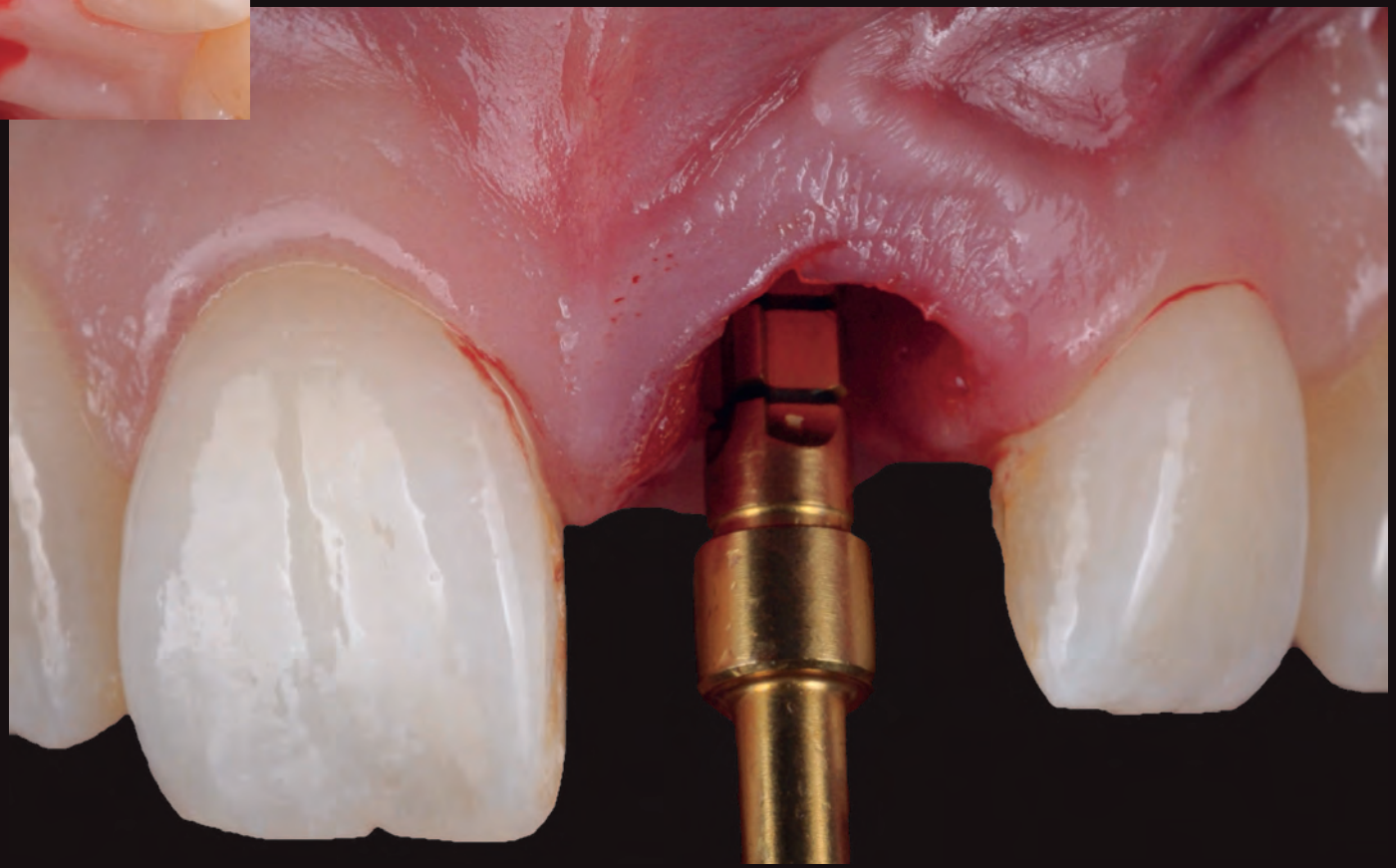
Initial situation: palatal view, inflammation has caused an over eruption of the tooth.



Peri-apical radiograph initial situation shows a PMF crown and metal post 3D planning virtual implant with Acteon 3D APP. Planning by drawing lines only, does not provide a three-dimensional view and therefore it is not advisable. By planning an implant virtually, it is possible to have a better view of the implant in all directions and its relation to anatomical structures, such as the incisal foramen.

Temporary acrylic tooth: this will be our reference during osteotomy and temporary crown. It is not a surgical guide, but allows to check directions during drilling for the osteotomy. Initial incision in gingiva to prevent rupture during extraction. It is important to extract the tooth without any trauma by using forceps. This means not to luxate because this can cause fracture of the labial wall, instead it is advisable to rotate the root.



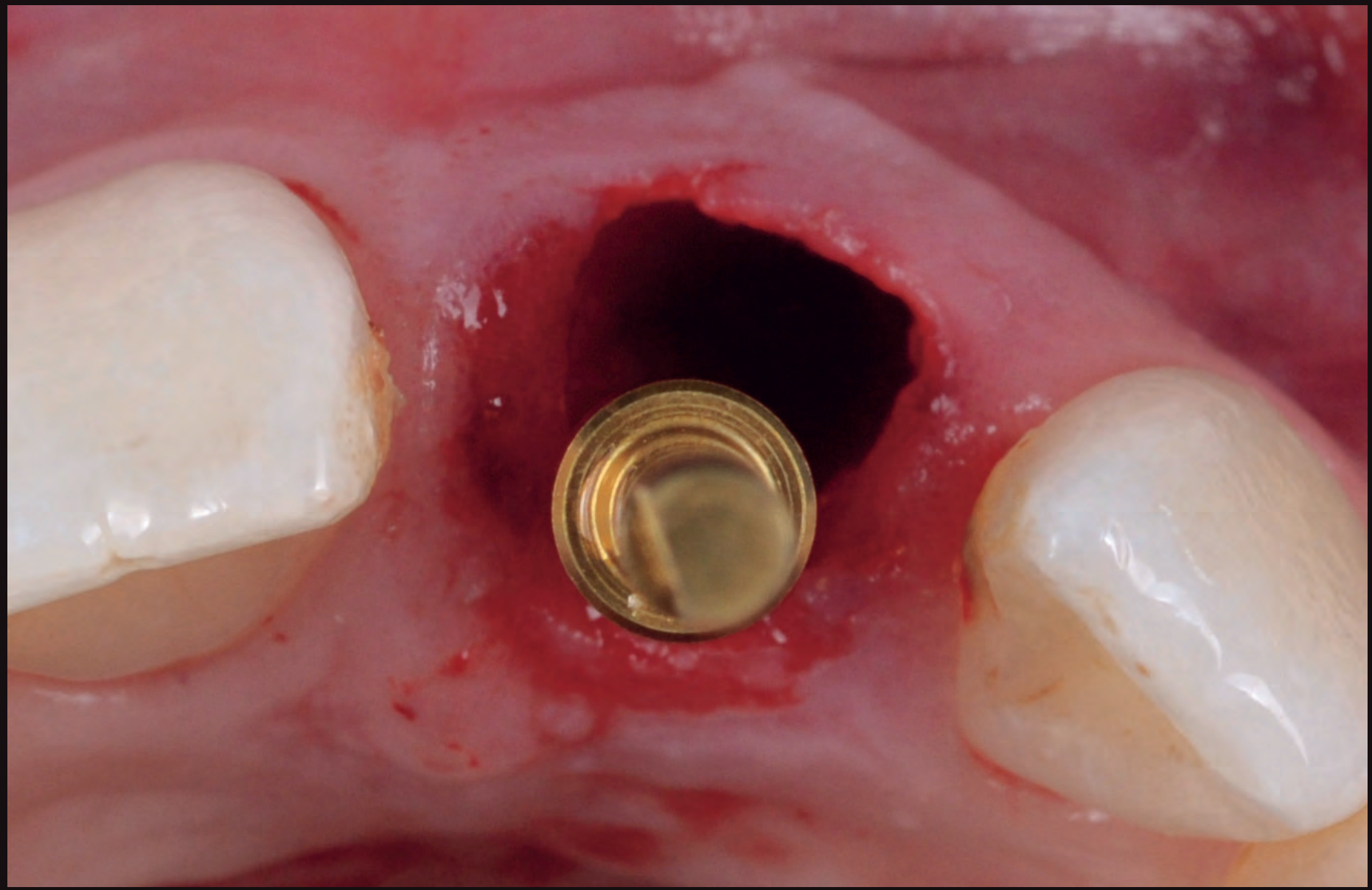


Reference with temporary acrylic tooth, there is 1 mm labial recession, this will be adjusted after implant placement. Therefore, a connective tissue graft is necessary.

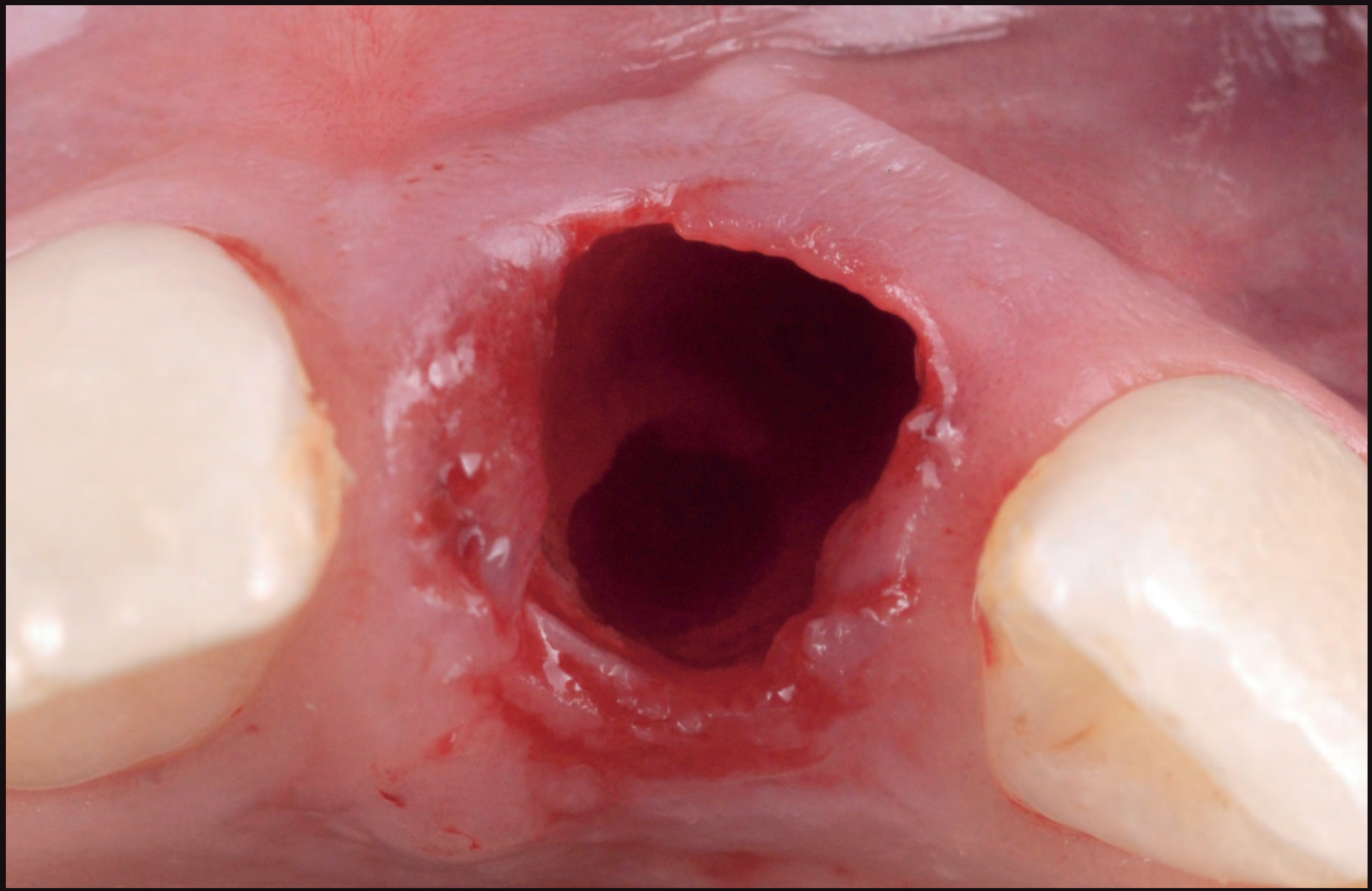
Reference with temporary acrylic tooth; occlusal view: there is a palatal opening for osteotomy burs and temporary abutment.

2.8 mm drill in extraction alveoli: labial view correct direction mesio-distally.

Post extraction socket after atraumatic extraction: the bleeding is minimal, and the alveolar bone has not fractured. At this stage, the osteotomy in the palatal wall is drilled to place the implant, slightly more palatally.

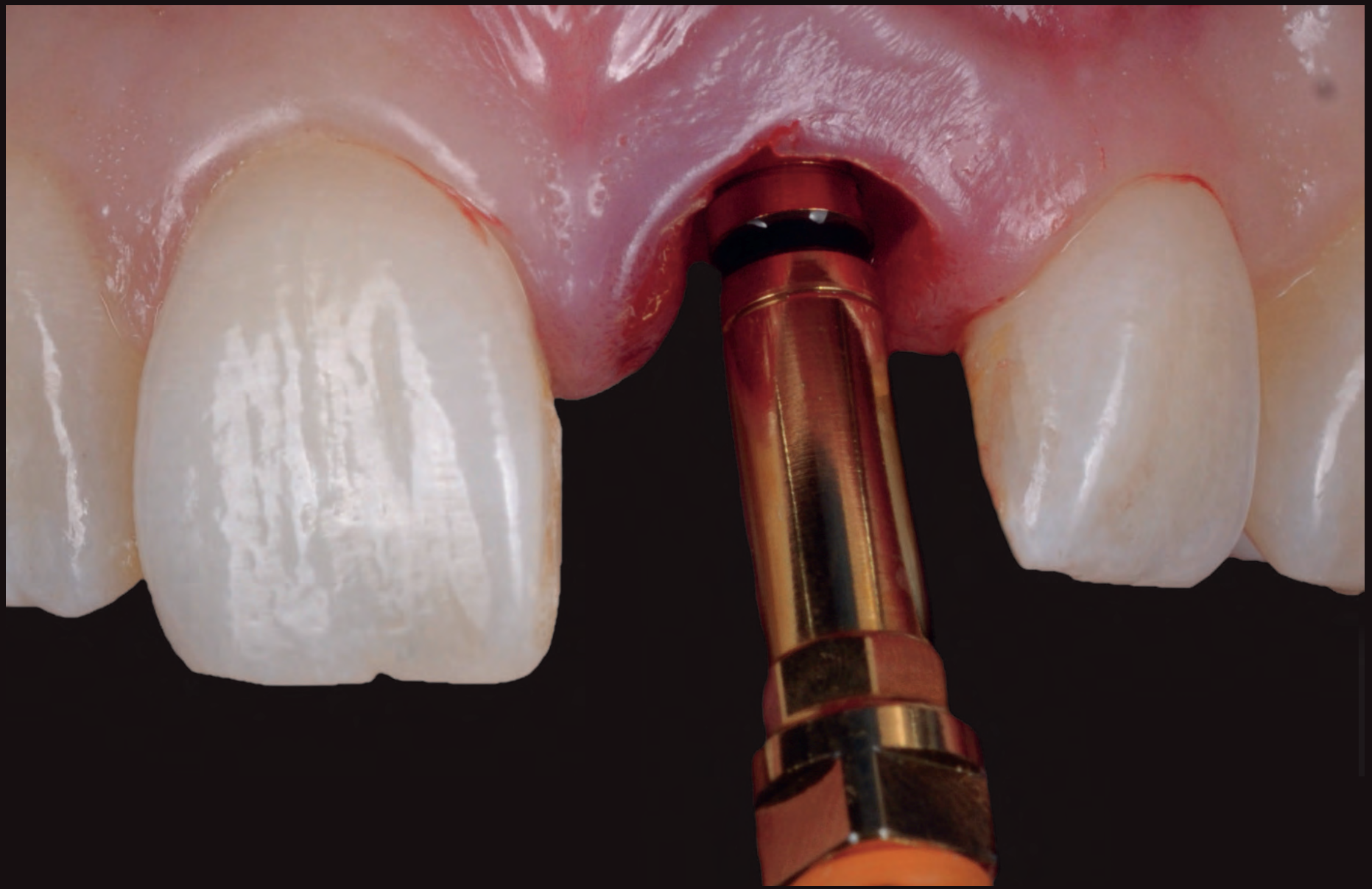


Orientation pin during the drilling phases. This clinical check is very helpful to ensure the right implant axis inclination. it is suggested to repeat the procedure for each drill used in the recommended sequence.

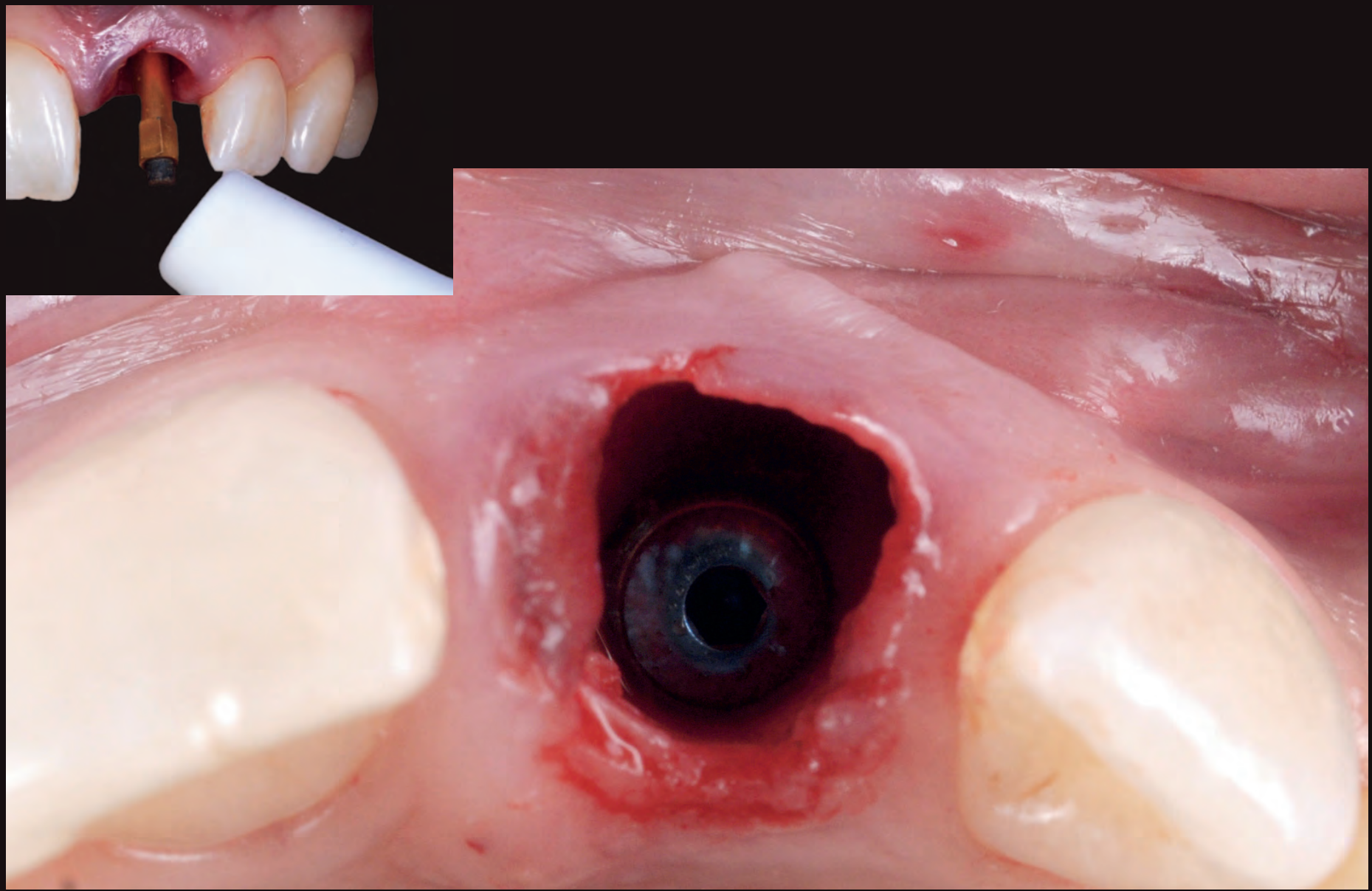


Osteotomy in extraction alveoli on the palatal side where the alveoli is located more labially. It's crucial to change the future implant axis inclination due to the different one comapred to the tooth, that is always too labial.

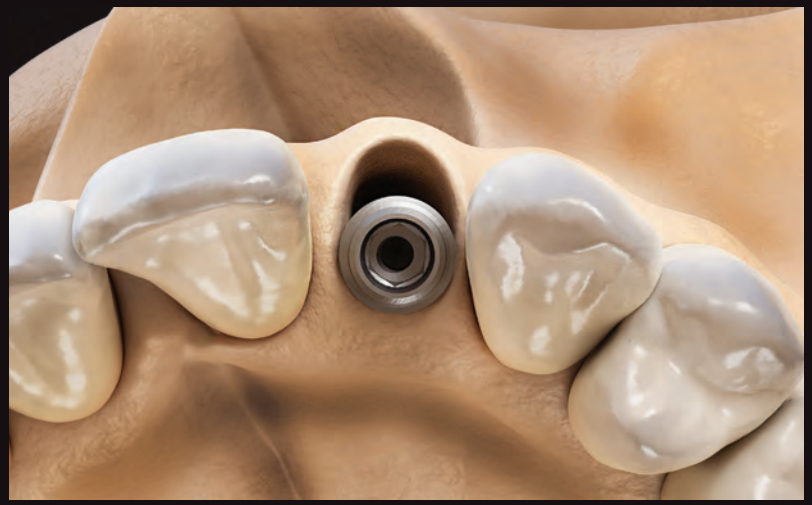
Immediate implant placement, using Megagen AnyRidge® implant. The sharp threads guarantee a high initial stability, necessary for an immediate loading.

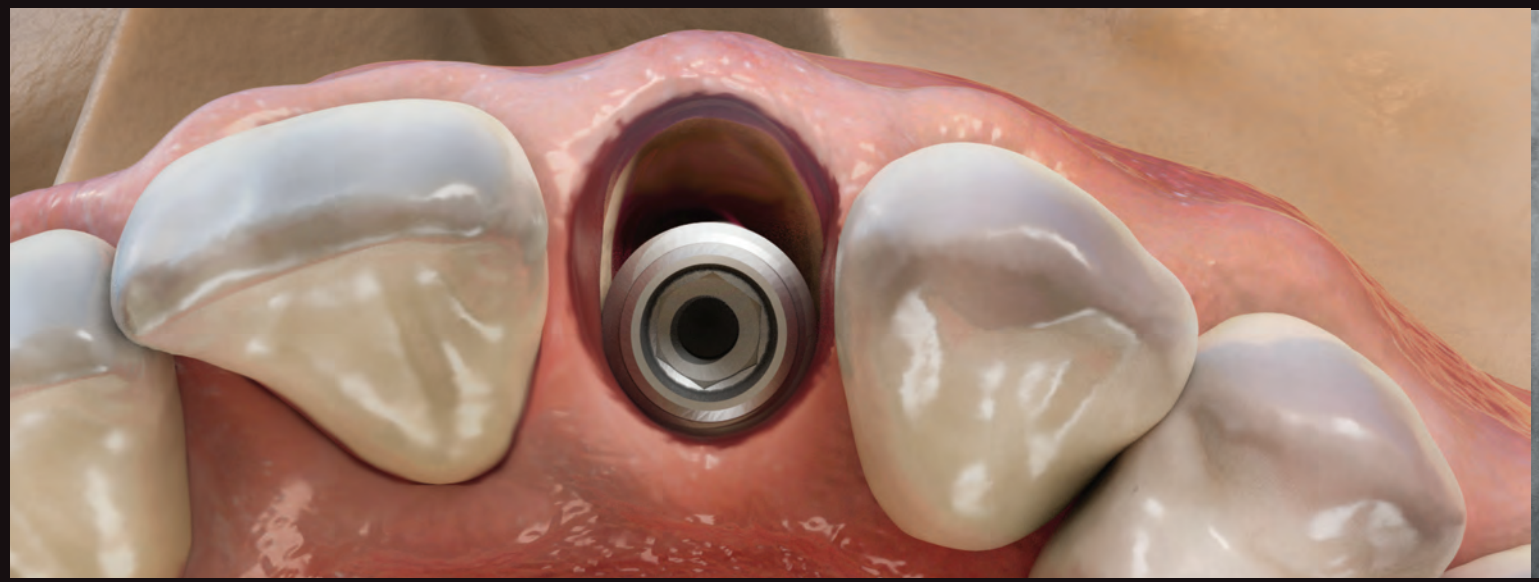


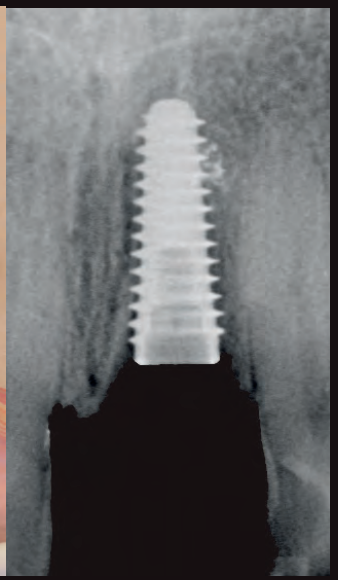
mplant driver to correct depth, implant needs to be 3 mm below the gingival line. The black line on the implant driver shows the correct depth position of the implant.



SQ measurement is used for stability, if the score is over 75 than it is safe to do an immediate load. A smart peg is inserted in the implant to measure the radiofrequency analysis. If the frequency is high, the stability is good.

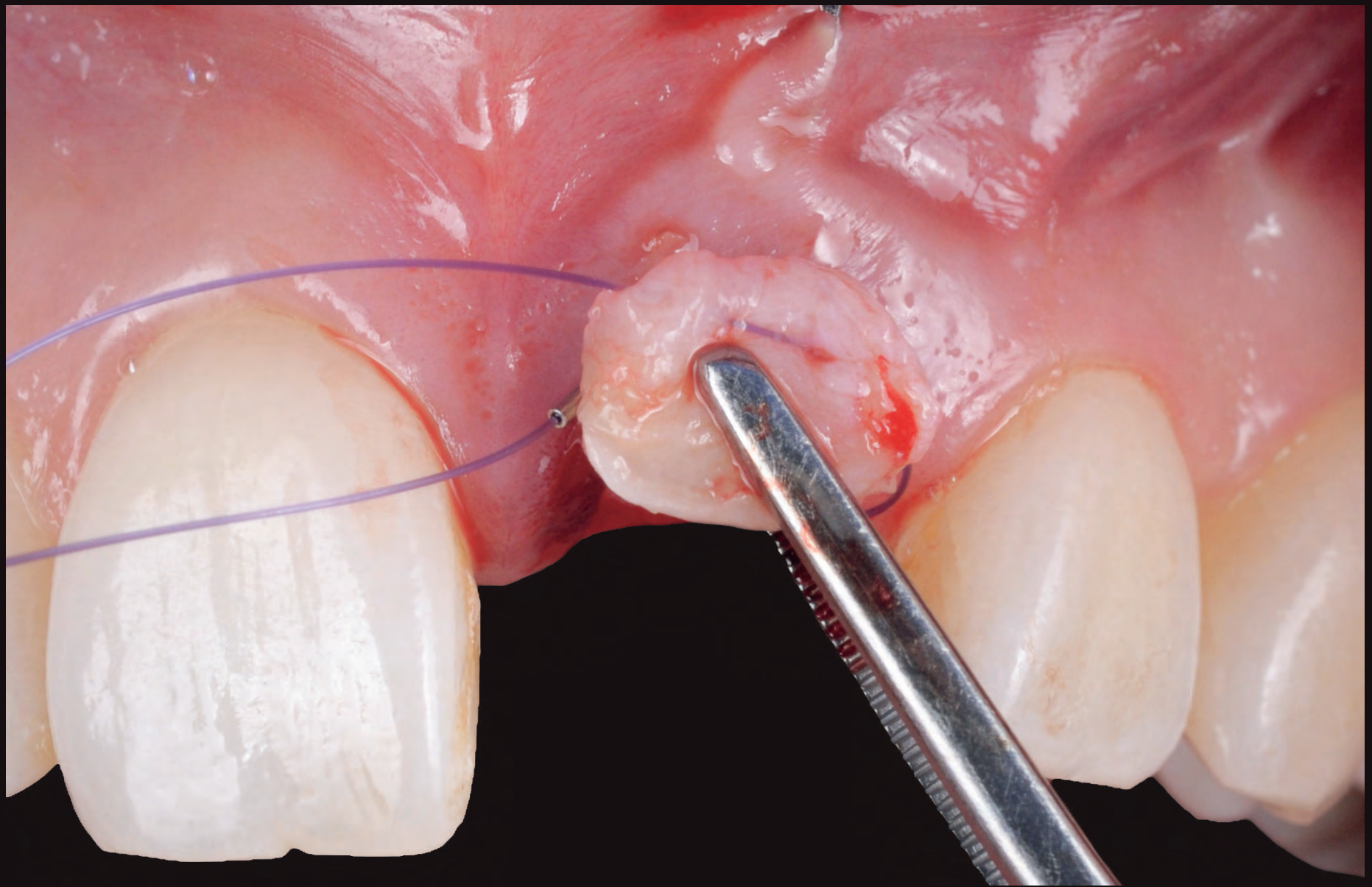




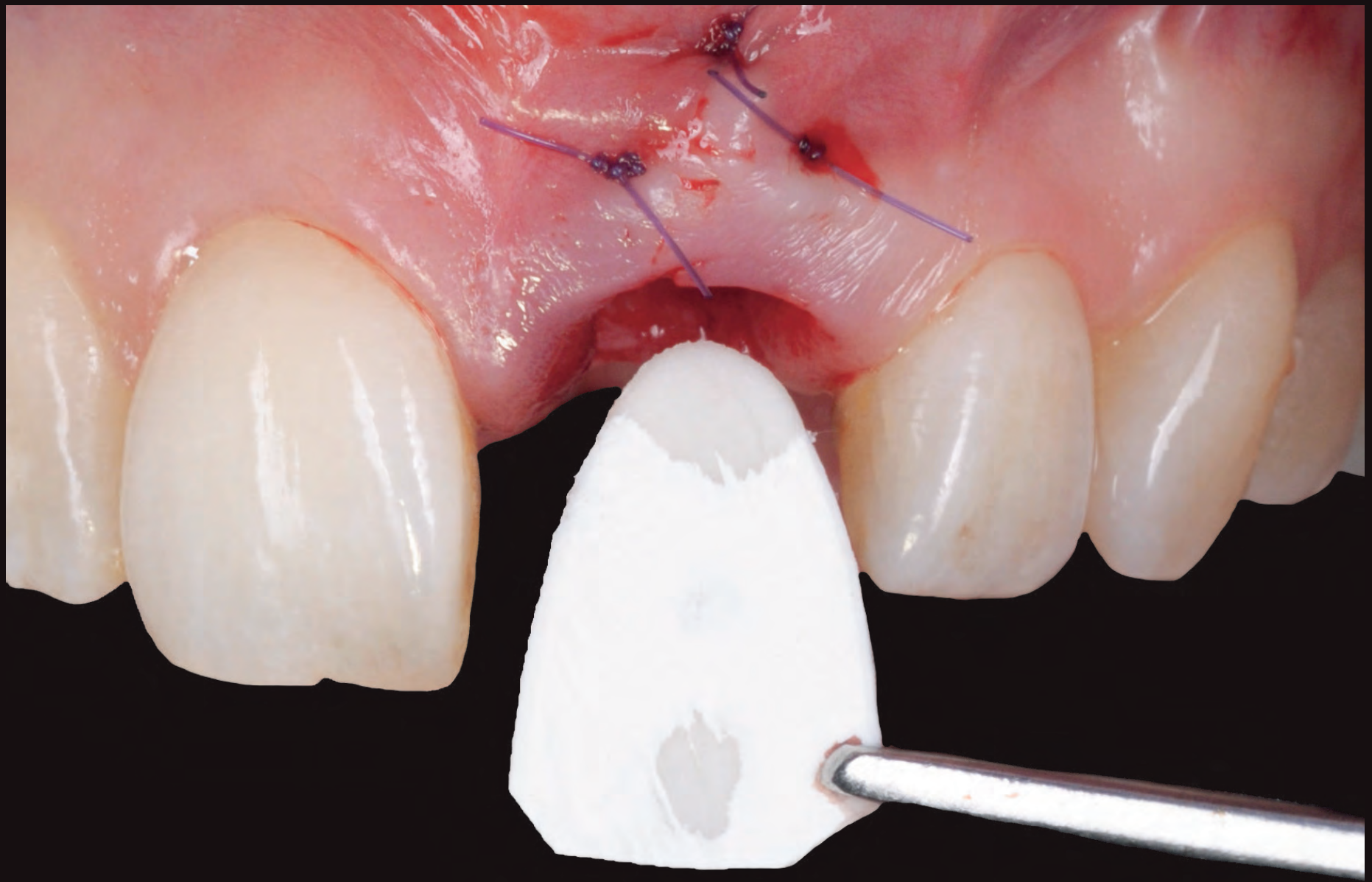


ANIMATION

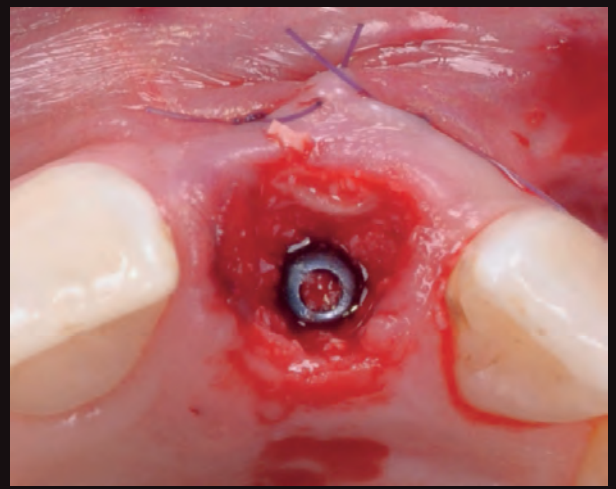
Peri-apical radiograph after implant insertion the implant has been positioned more mesio-palatally than the extraction alveoli.

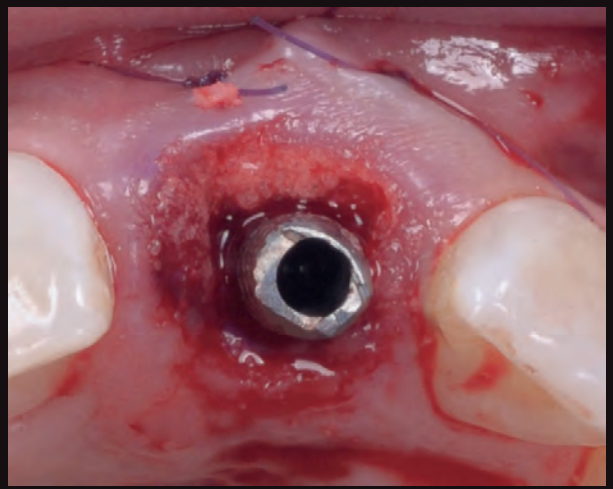


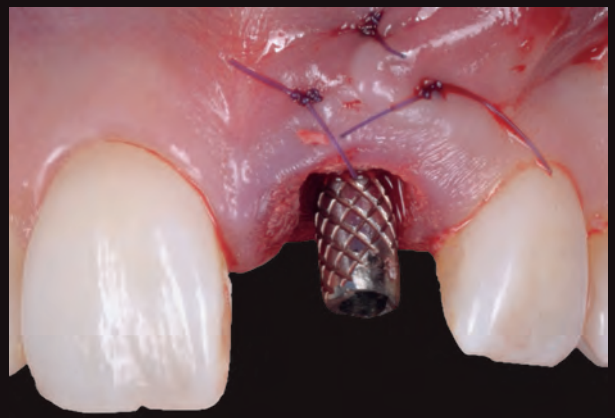
Connective tissue graft which was collected from the tuberosity is sutured. The suture enters from labial, goes through the graft and back, and the last suture goes inside out across the labial to secure the graft.



Placement of a collagen membrane Bio-Gide® Shape (Geistlich) labially, to prevent soft-tissue ingrown.

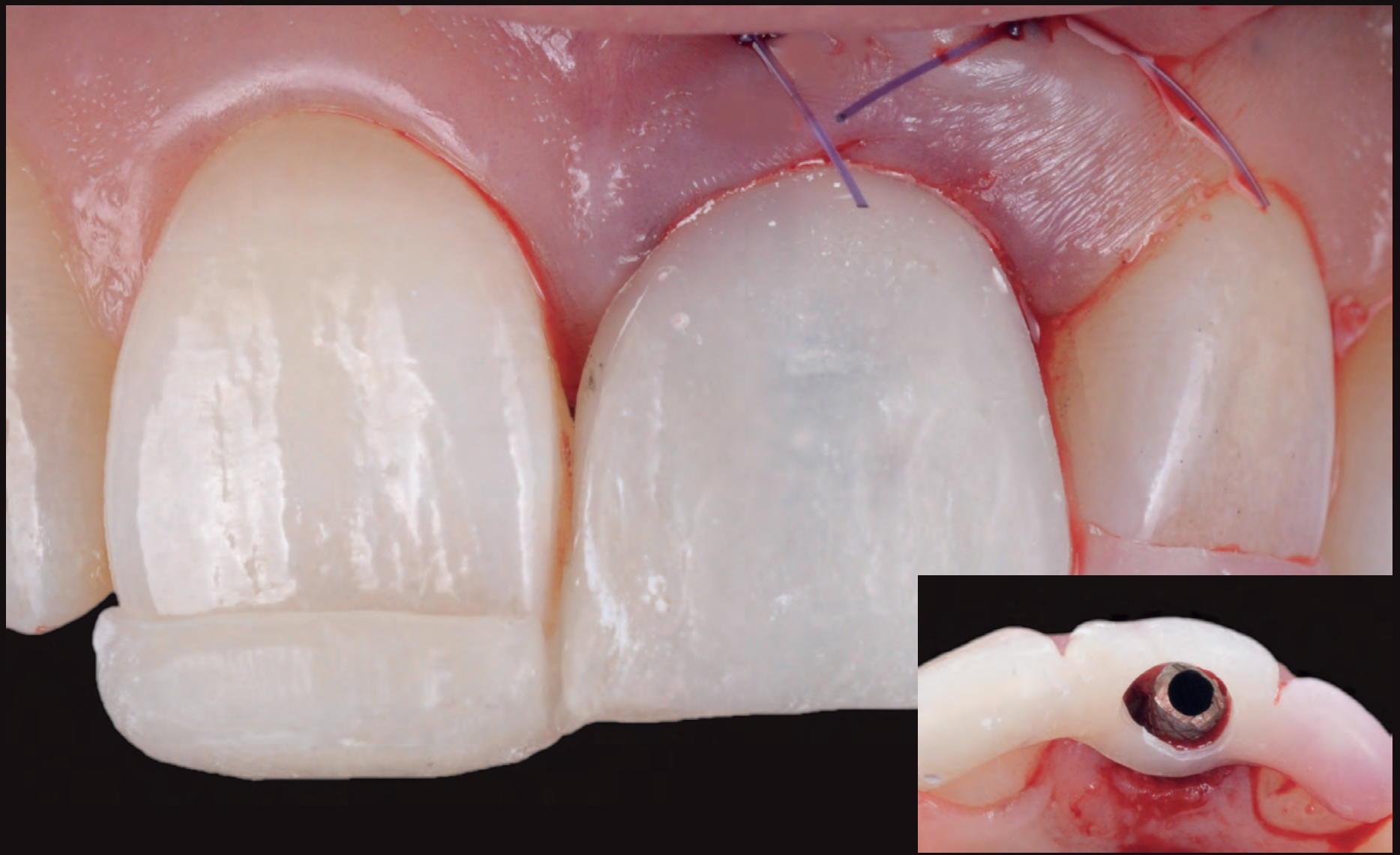






Guided bone regeneration placement of bone granules particles, in the gap between implant and collagen membrane. This will prevent soft-tissue ingrown. Placement of temporary abutment, which was reduced 2 mm from the incisal edge of adjacent teeth.

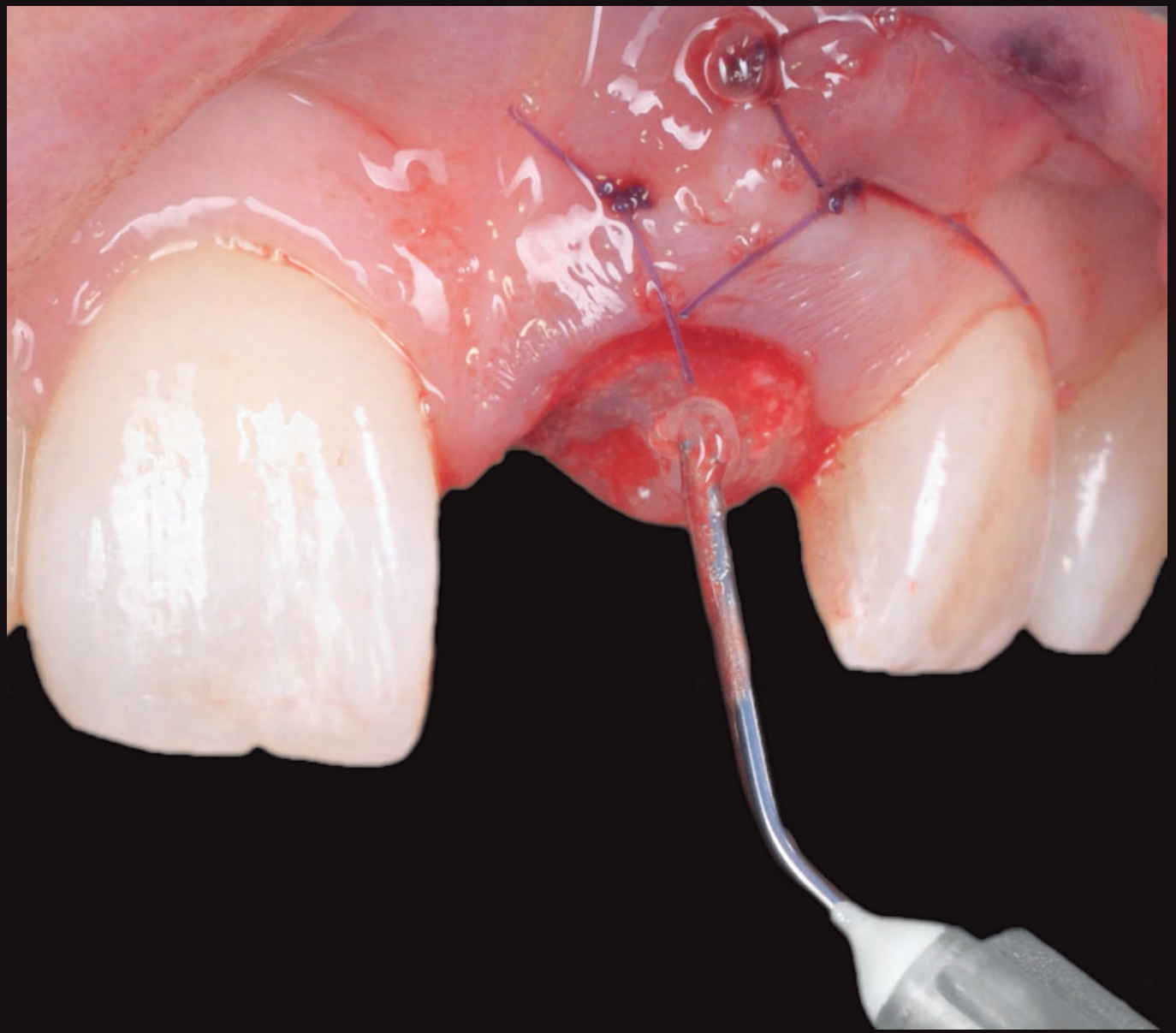
Occlusal view of temporary abutment, slightly tilted distally. After placing the temporary on the abutment, they will be jointed with flowable composite resin. The two pieces are then unscrewed from the implant and the temporary crown is made at the chairside.



Temporary acrylic resin tooth in place. Resin extensions were added to fit in the correct position the future screw-retained restoration.

Temporary acrylic tooth from occlusal view. An occlusal space for the screwdriver was left, by means of the provisional crown reduction.

Temporary crown labial view. A selected reduction of the distal area and a resin addition in the mesial one was provided, so that a different soft tissues force was possible with a provisional crown. 23 Lateral view of temporary crown; there is a concave running room to guarantee enough thickness of the soft tissues. The calibrated S-line buccal contour was provided by the dental technician to support the buccal emergence profile of the soft tissues.

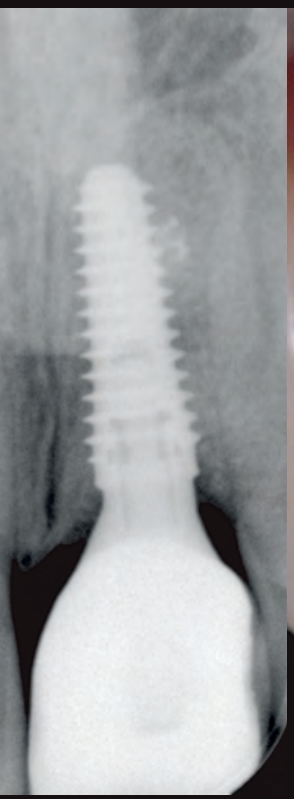


Inserting blue®m Oral Oxygen Gel onto implant for an antiseptic effect. When the crown is unscrewed from the implant there is no smell of bacteria.

Final stage after surgery when the patient is discharged. The gingival zenith was slightly coronal if compared to the adjacent tooth 1.1. However, if an additional apical zenith replacing is necessary, this will be easily achieved by the dental technician on the permanent restoration. The temporary crown screwed into position. A good soft tissues support was achieved.

Two weeks post-operative: soft tissues have healed uneventfully, and the recession is also tweaked by adjusting the emergence profile of the crown. A natural soft tissues appearance was achieved, and the corresponding growth was already satisfying.

Peri-implant soft-tissue labial view there is no recession and the papillae did not recede. The stability of peri implant soft tissues was evaluated three months after the provisional. The symmetric architecture if compared to tooth 1.1 was achieved, before fitting the final restoration.



Final situation with definitive crown in place. A natural appearance with a balanced pink and white proportions was achieved from the esthetic point of view. Peri-implant soft tissues were well integrated with soft tissues of adjacent teeth, and symmetric to the contralateral ones. Moreover, a natural ceramic crown (stratified lithium-disilicate) texture was provided by the dental technician, and a perfect integration with the contralateral tooth as well. The screw retention mode was selected.

Peri-apical radiograph of the final restoration. Peri-implant hard tissues are stable. For the crown mid to long term maintenance the screw-retained solution of this single crown was helpful, due to the easy removal if any peri-implant soft or hard inflammation may occur.

REFERENCES

Lateral view final restoration. Peri-implant soft tissues are well integrated with the adjacent ones. A natural appearance of the smile can be provided for the patient. The proper vertical over-contour will provide a stable peri-implant soft tissues support.