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Different Approaches for Vertical Ridge Augmentation : A Retrospective Case study

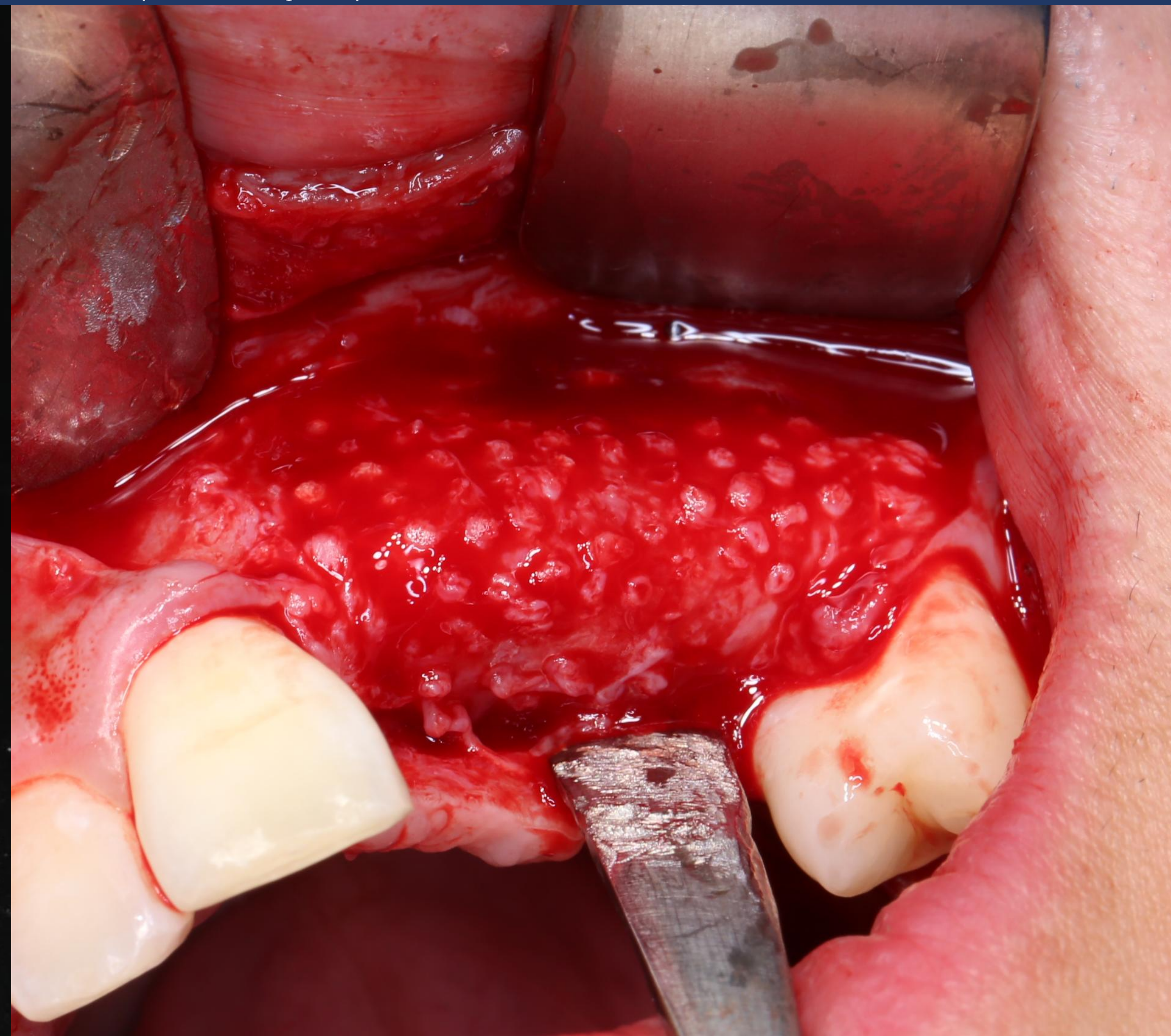
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Introduction:

Severe vertical ridge deficiency presents a formidable clinical challenge, often compromising the potential for prosthetically driven implant placement and long-term success. To address this, various guided bone regeneration (GBR) techniques have been developed, ranging from traditional methods using resorbable membranes to advanced digital approaches with customized 3D-printed titanium meshes. This case series aims to evaluate and compare the clinical and radiographic outcomes of four distinct vertical GBR techniques for reconstructing severely atrophic alveolar ridges.

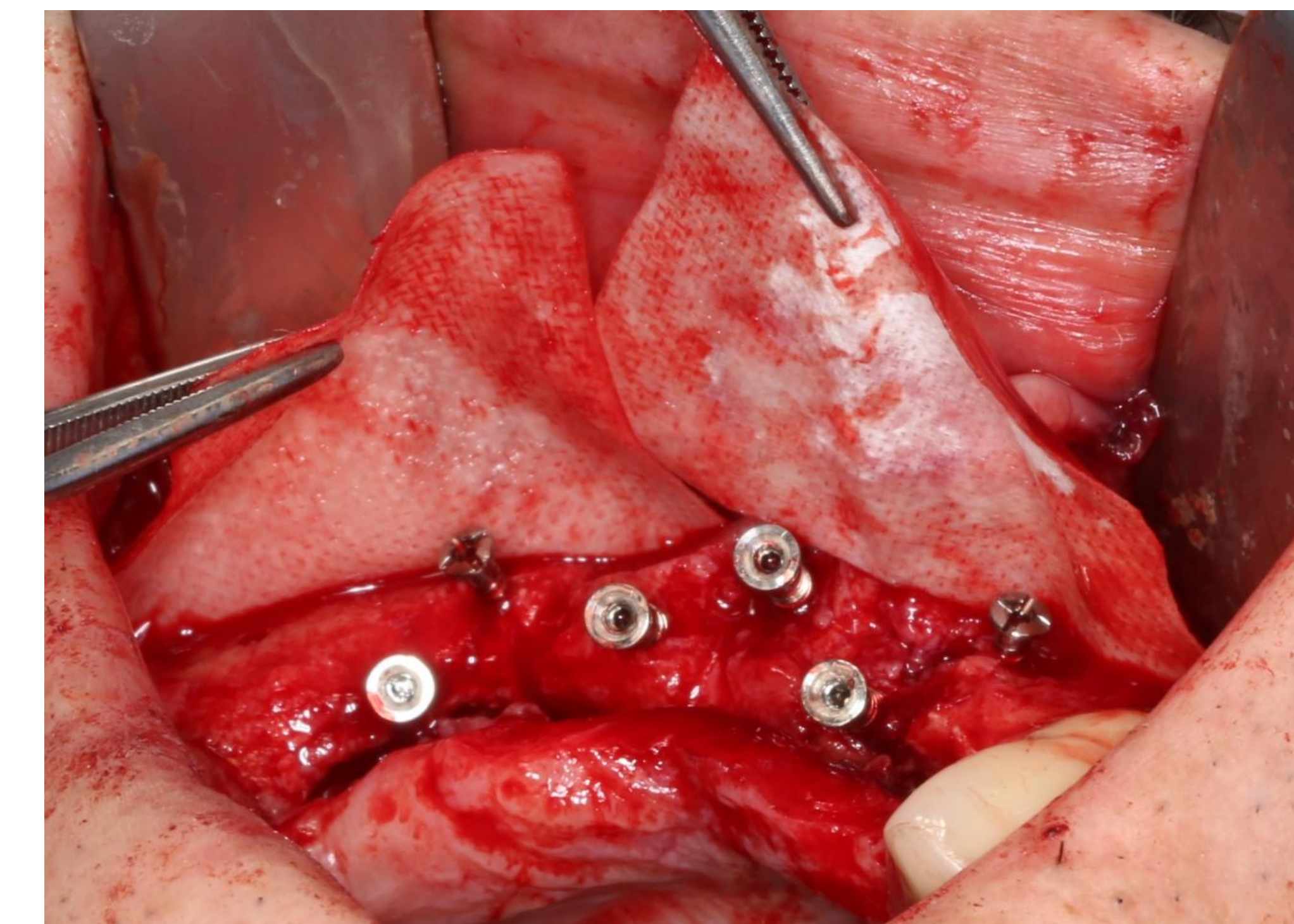
Method:

This retrospective case series included 18 patients (22 sites) who required extensive vertical ridge augmentation prior to implant placement. The techniques evaluated were: (1) GBR utilizing tenting screws and bone tacks with a resorbable collagen membrane, (2) GBR using a fixture-retained titanium mesh, and (3) customized 3D printed Ti-mesh. Vertical bone gain (VBG) was measured in millimeters using pre- and post-operative CBCT scans.

Results:

The vertical bone gain (VBG) achieved with the tenting screw technique, fixture-retained mesh, and the customized 3D printed Ti-mesh. A total of 45 dental implants were successfully placed in the augmented bone, demonstrating a 98% survival rate after functional loading. No significant intraoperative or postoperative complications, such as membrane exposure or graft infection, were observed across the cases.

Conclusion: Within the limitations of this case series, vertical augmentation modalities proved to be predictable and effective for reconstructing severely deficient alveolar ridges, enabling successful implant placement.



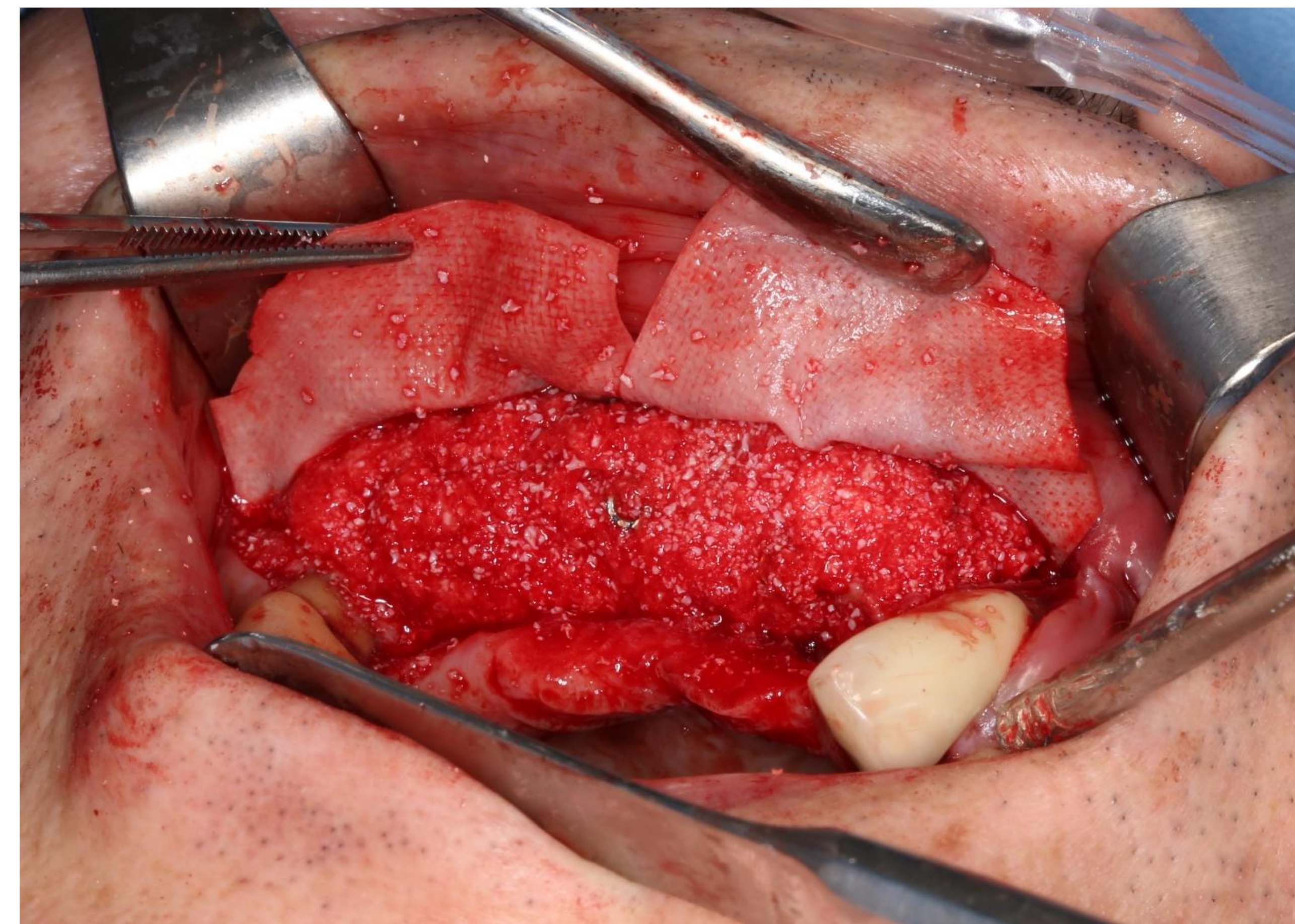
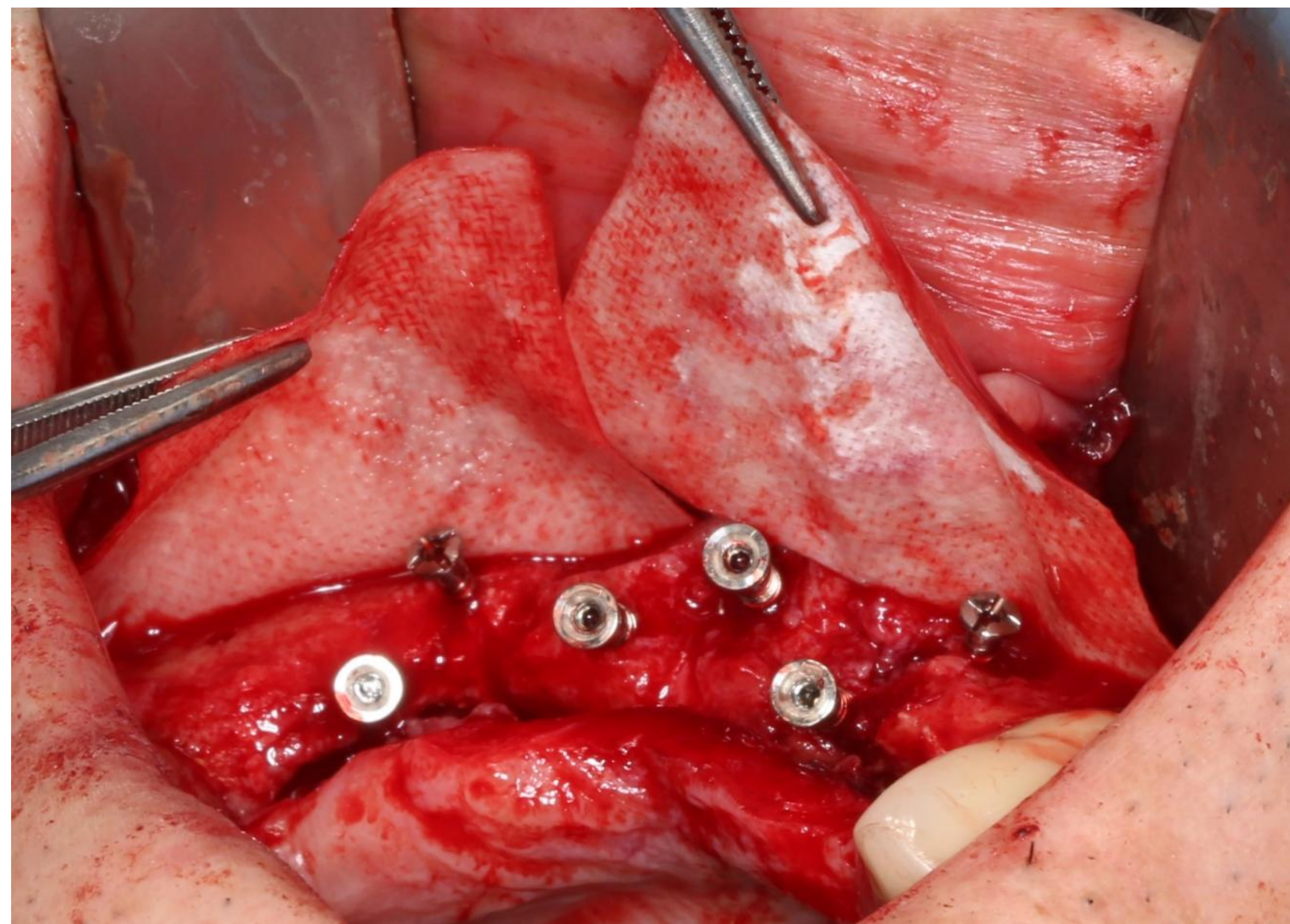
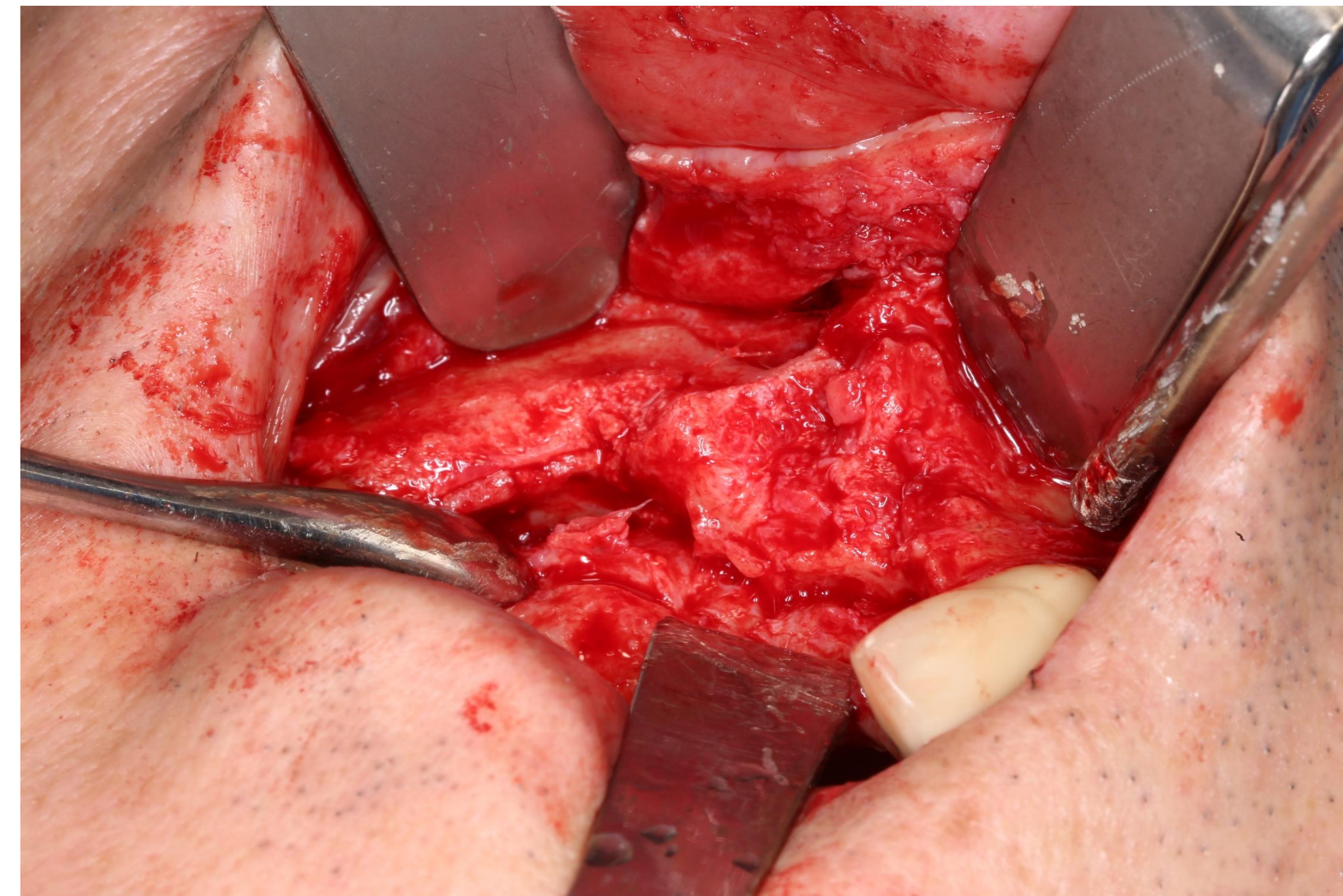
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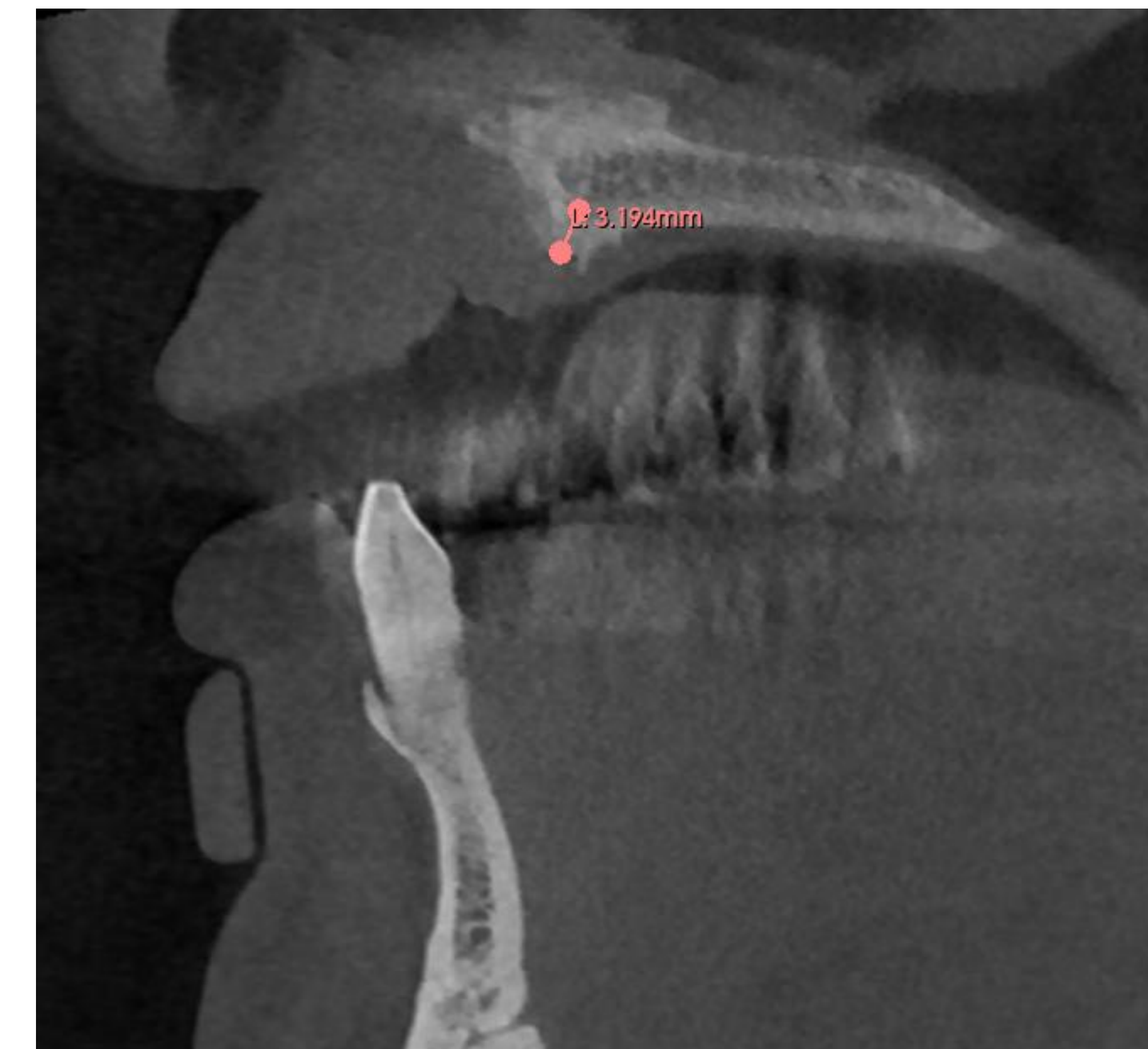
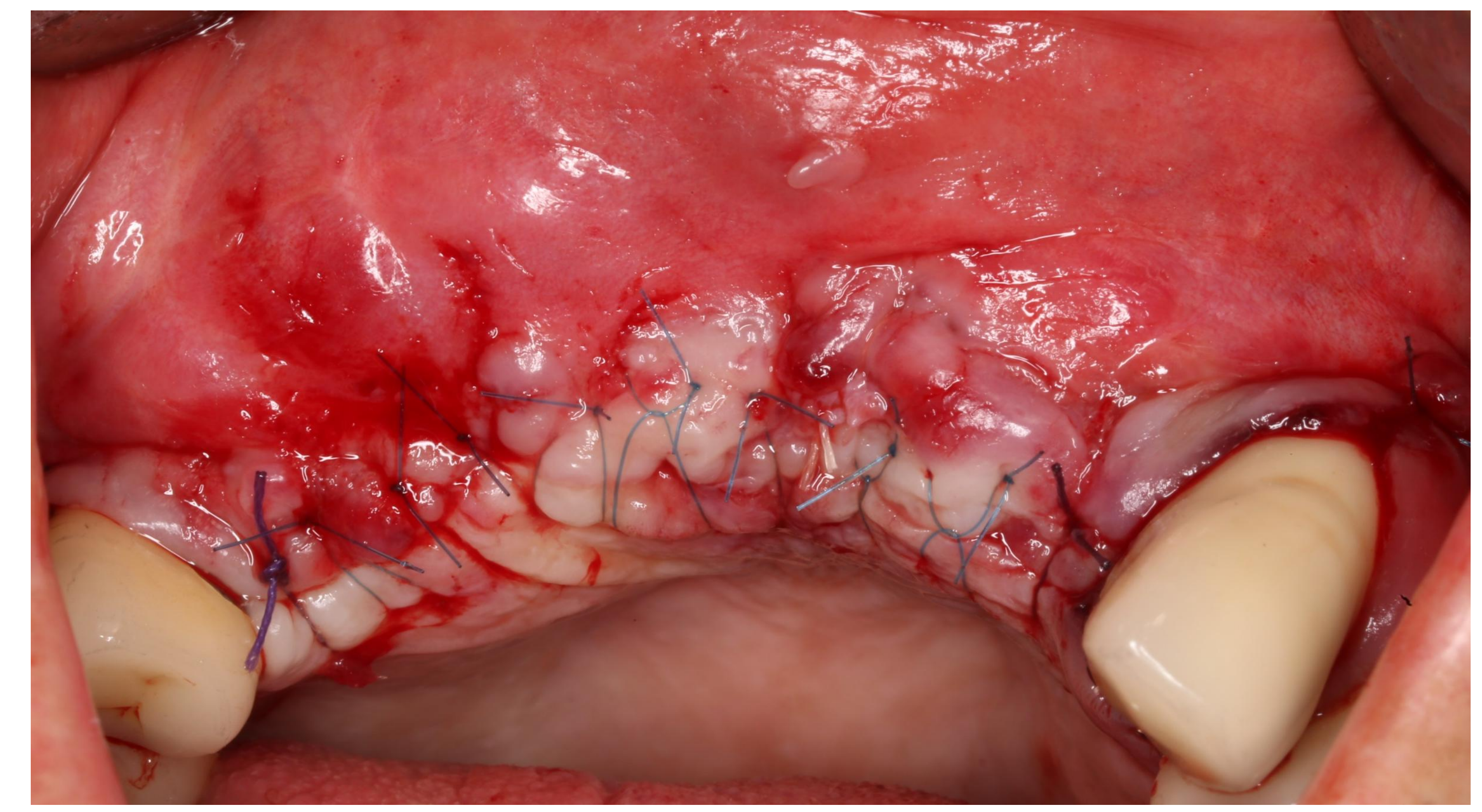
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Vertical GBR using tenting screw



Post operative bone enhancement



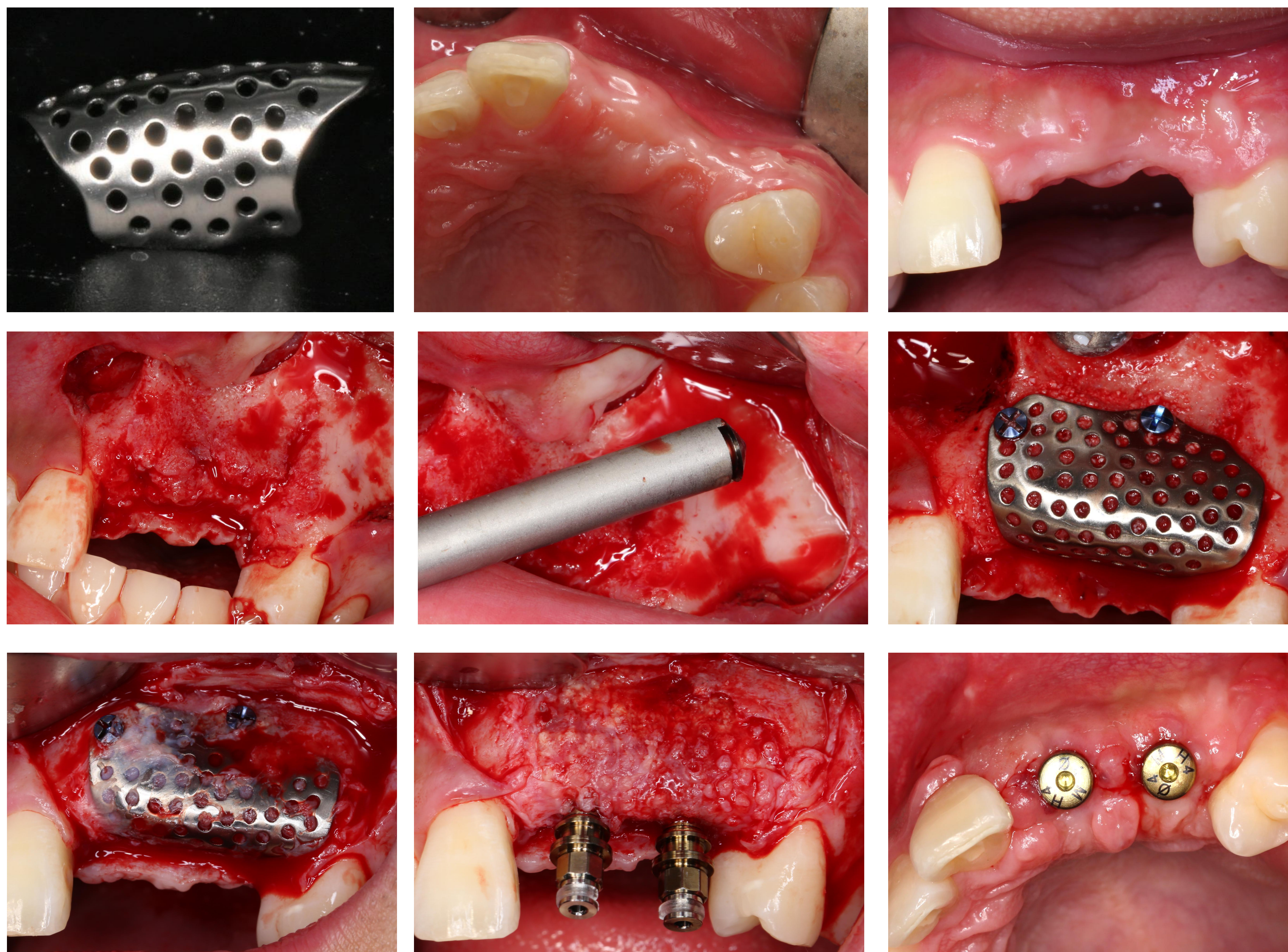
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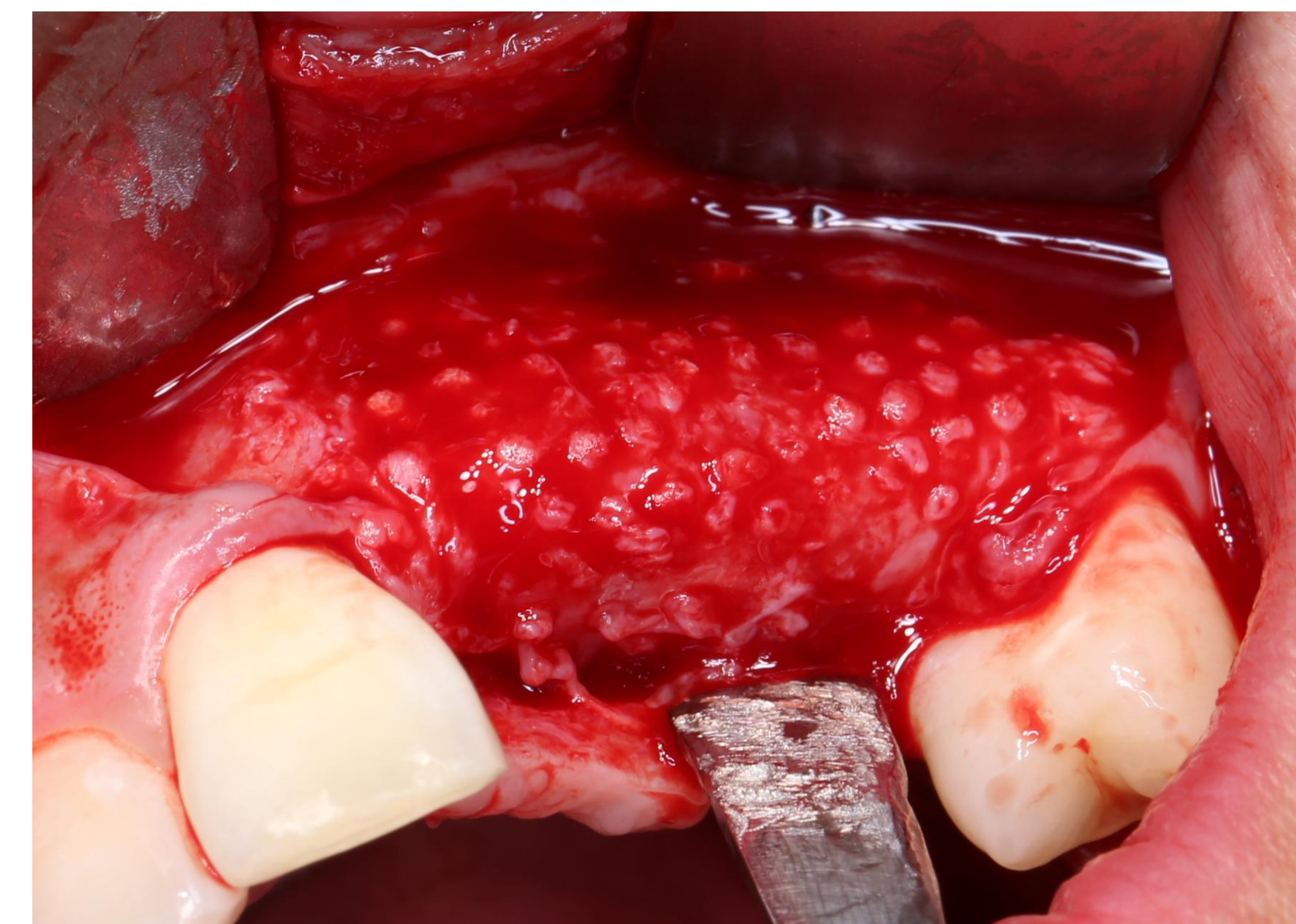
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Vertical GBR using Customized 3D Ti-mesh

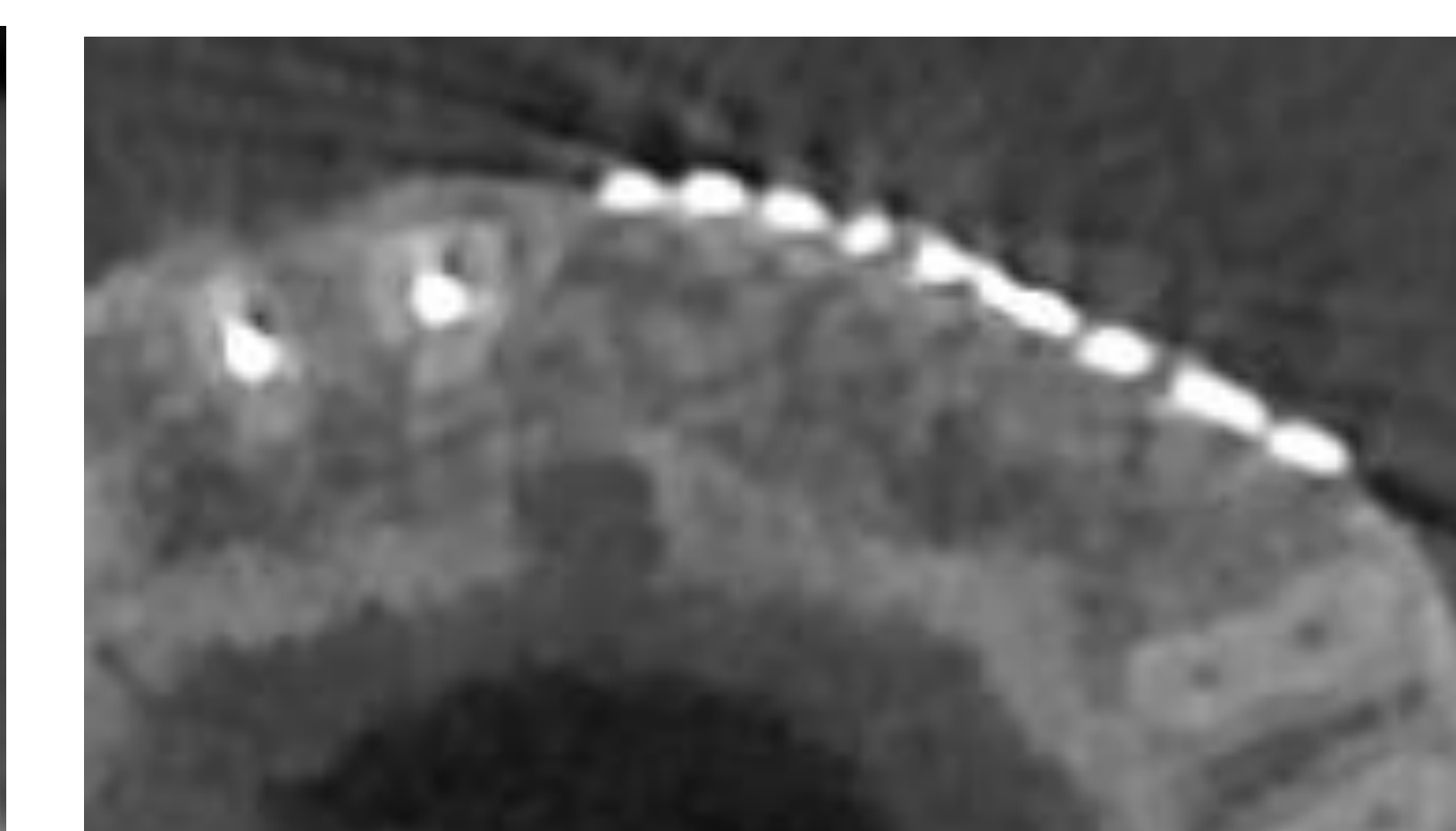


Post-operation / 6M



Pre-operation

Post-operation



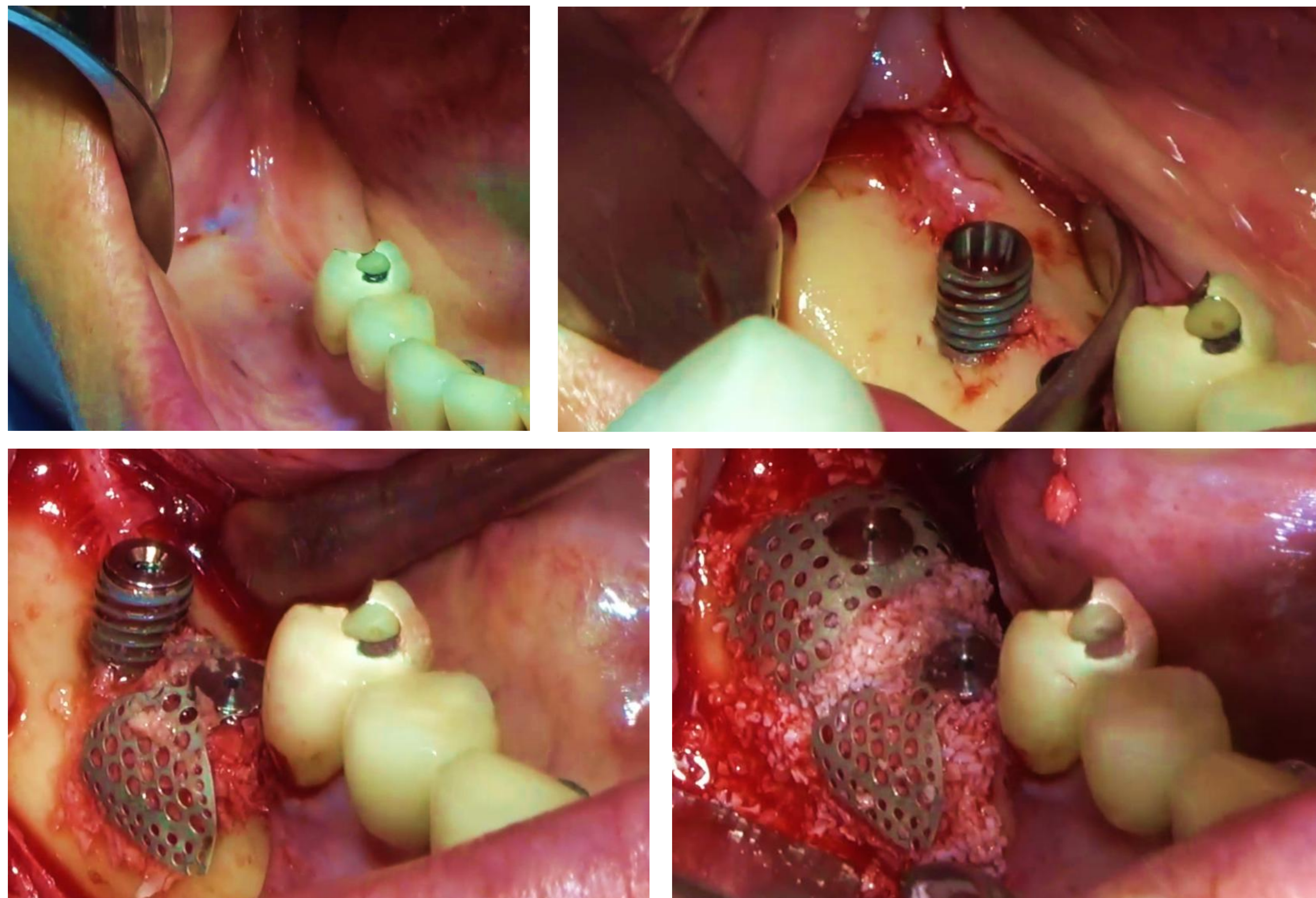
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Vertical GBR using Oss builder (Implant fixture, Ti-mesh)



Post operative bone enhancement

