



Horizontal Ridge Augmentation via the Shell Technique using a Titanium-Reinforced d-PTFE Membrane – A Case Report

Christian D. Davila, Samuel Smith, Arif Salman
Department of Periodontics, West Virginia University



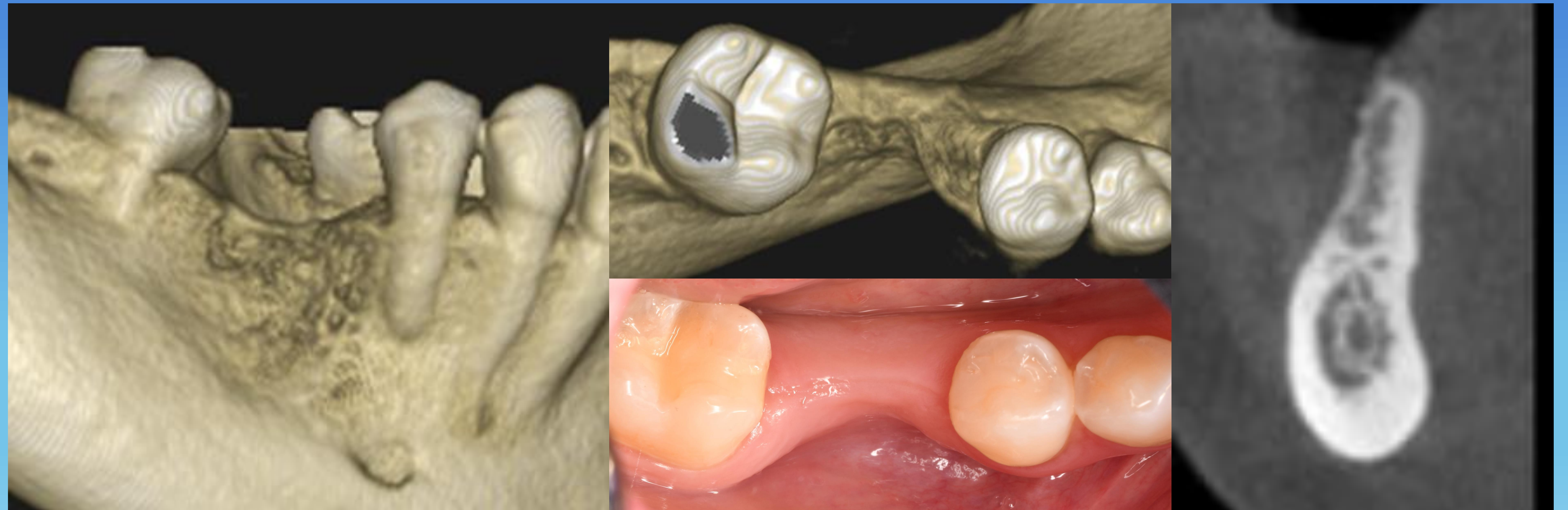
Background: Hard-tissue deficiencies prior to implant placement may be rectified by various protocols. The bone shell technique is a form of ridge augmentation using autogenous bone chips sandwiched between thin cortical bone plates fixated to the residual ridge. The combination of block or particulate grafts and non-resorbable membranes is a well-documented ridge augmentation technique.

Aim: The aim of this case report is to provide a novel and less invasive approach to the shell technique using a titanium-reinforced dPTFE membrane in substitution for the autogenous bone block.

Case Report:

A systemically healthy 32yo female presented to our clinic in search of implant therapy following a traumatic extraction of a lower right first molar approximately 9 months prior.

A horizontal ridge deficiency with a knife-edge was appreciated via CBCT, maintaining a width of 1.5mm at the crest and bordered by adjacent teeth providing adequate bony peaks.



CBCT 3-D rendering and clinical depiction of severe ridge deformity of the present patient



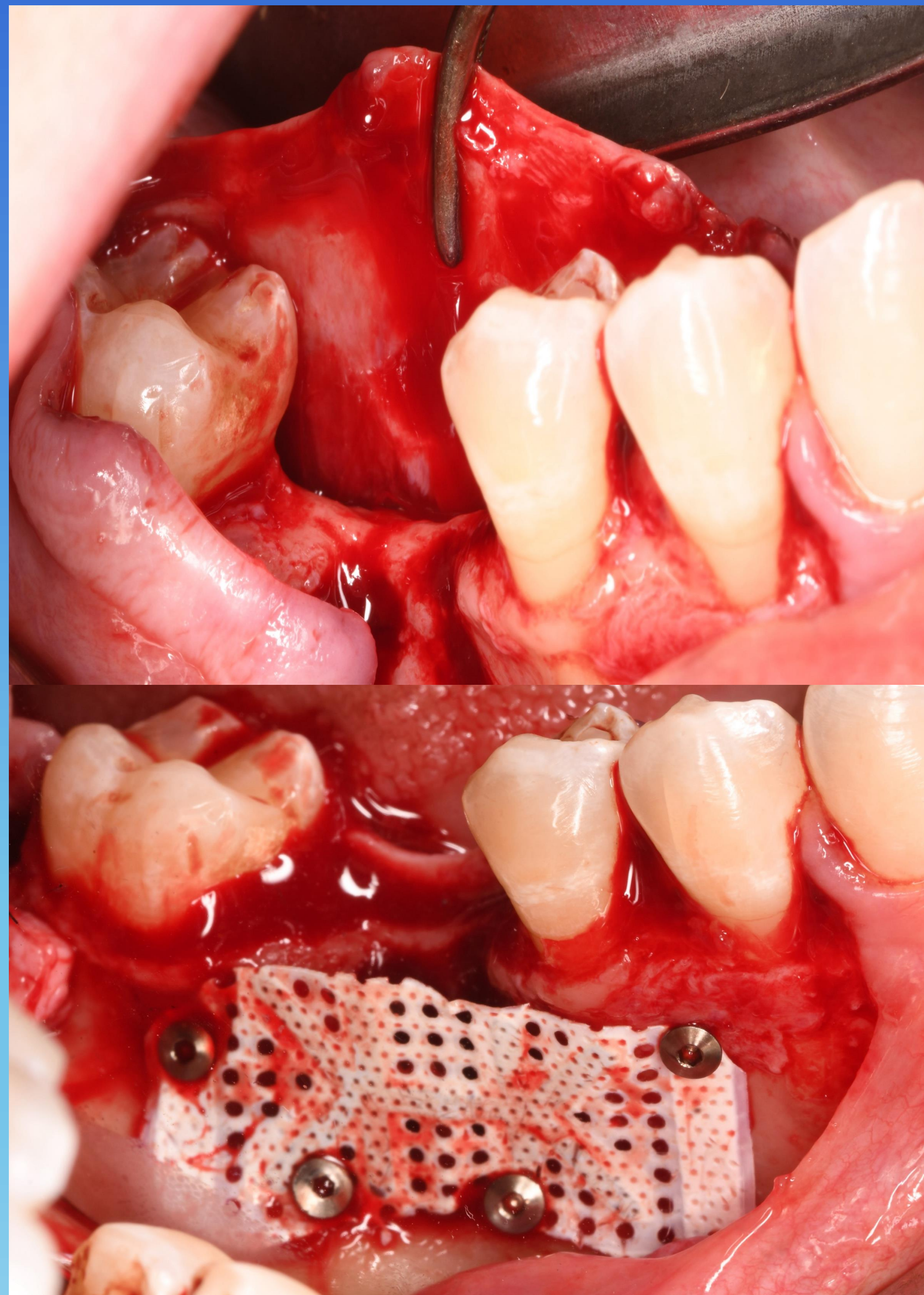
Horizontal Ridge Augmentation via the Shell Technique using a Titanium-Reinforced d-PTFE Membrane – A Case Report



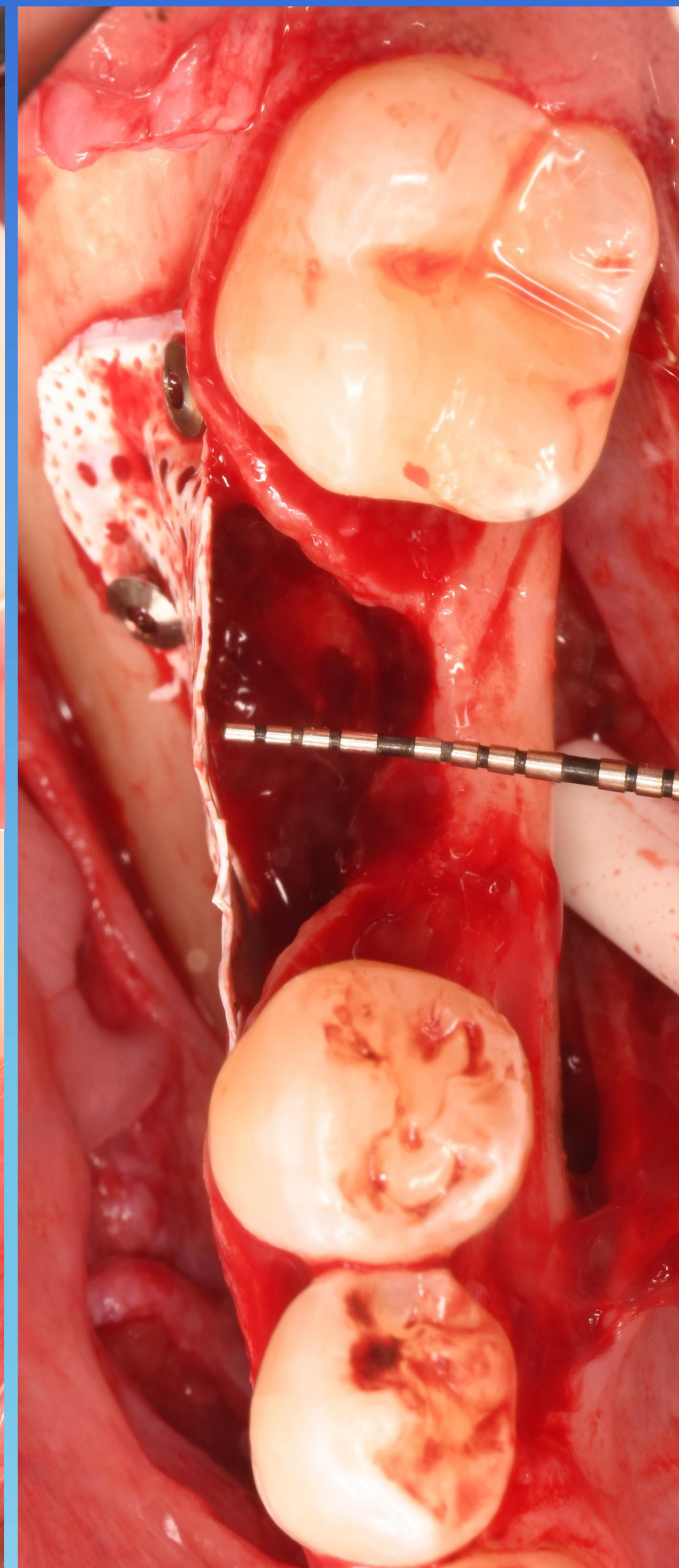
Christian D. Davila, Samuel Smith, Arif Salman

Department of Periodontics, West Virginia University

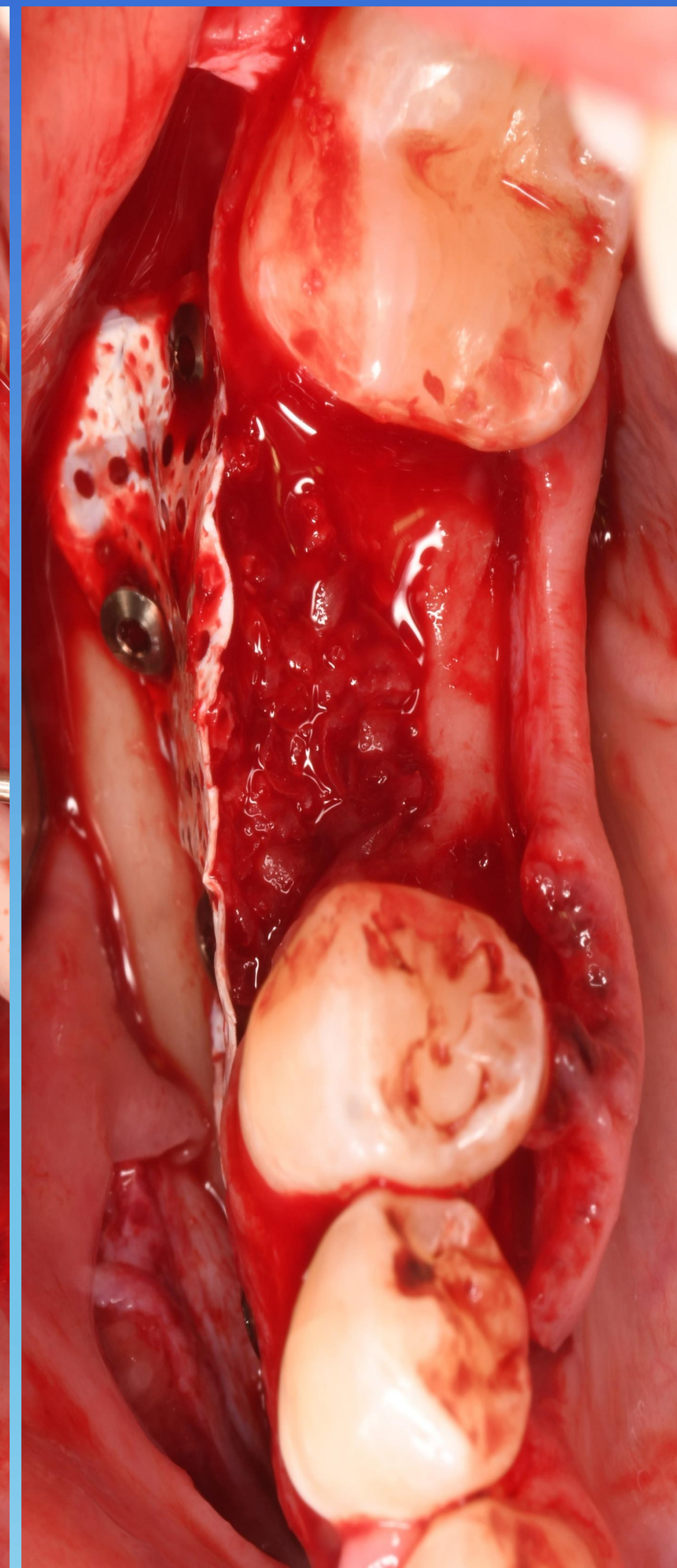
A full-thickness flap was reflected, decortication performed, and the periosteum was released to allow for sufficient flap mobility. A titanium-reinforced dPTFE membrane was trimmed and tacked to the buccal alveolar bone. A composite graft of 50:50 xenograft particles and autogenous bone chips was used to fill the void between the dPTFE membrane and the bone crest. Primary closure was achieved. The patient experienced uneventful healing without membrane exposure during the follow-up period.



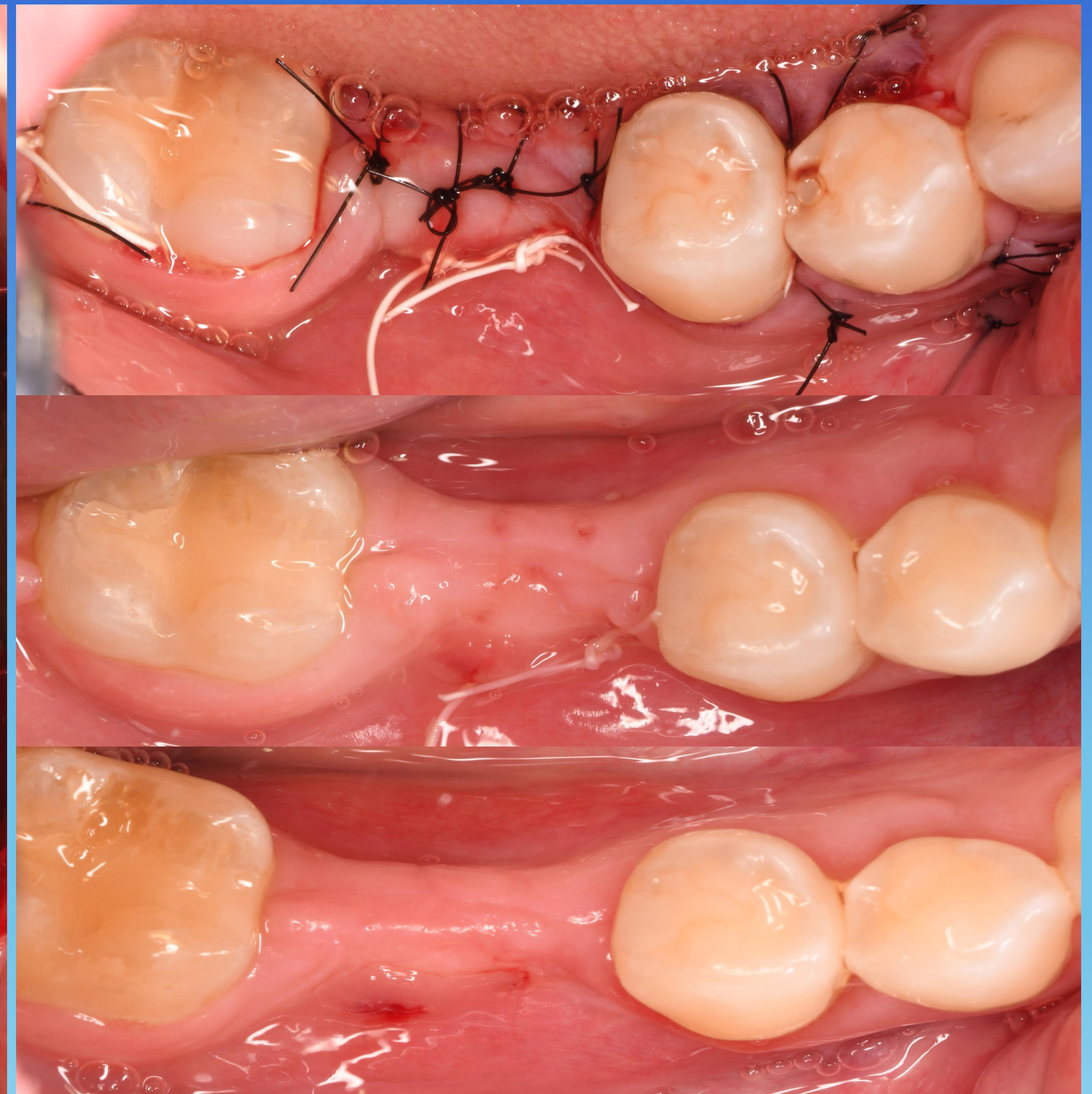
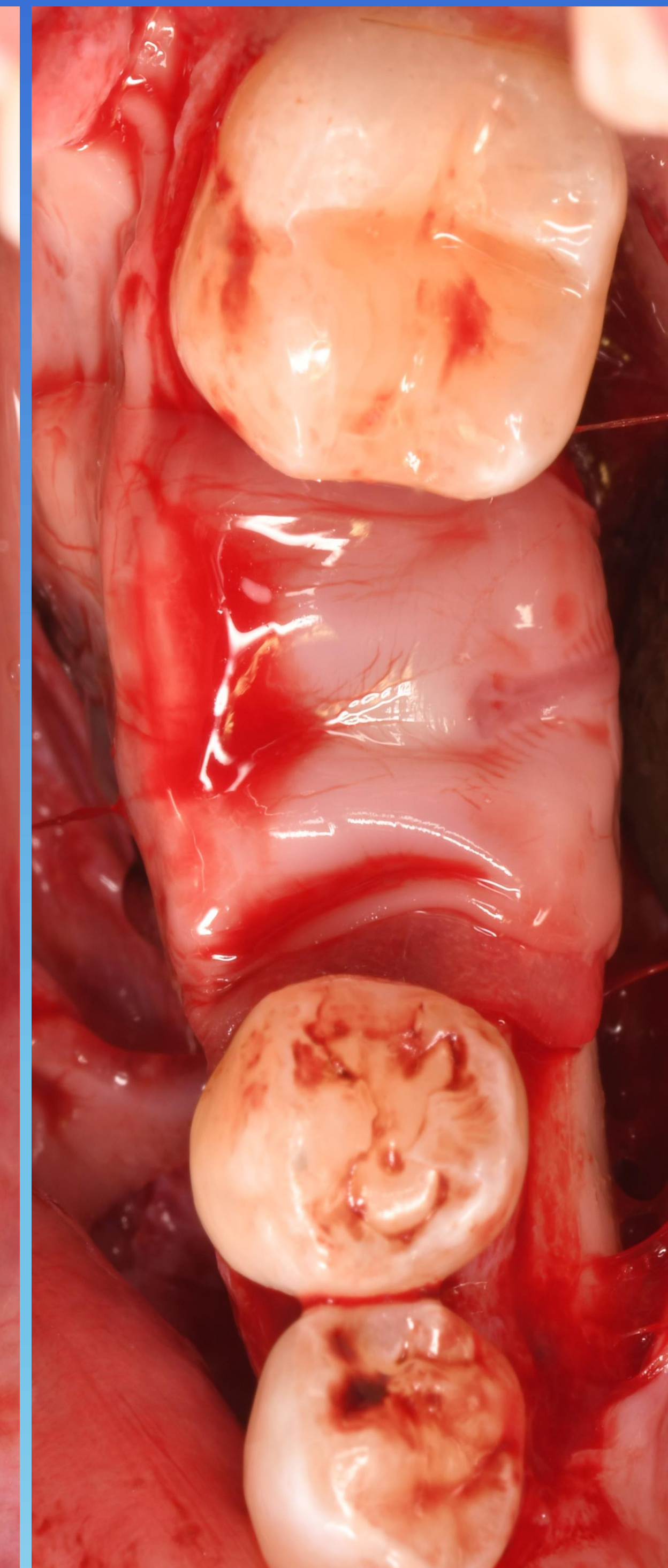
Fixation of the titanium-reinforced dPTFE membrane with tacking pins



Defect characteristics



Defect grafted with a 50:50 composite autogenous and xenograft bone graft followed by draping of collagen membrane and PRF membrane



Primary Closure, 2wk Follow-Up and 4wk Follow-Up



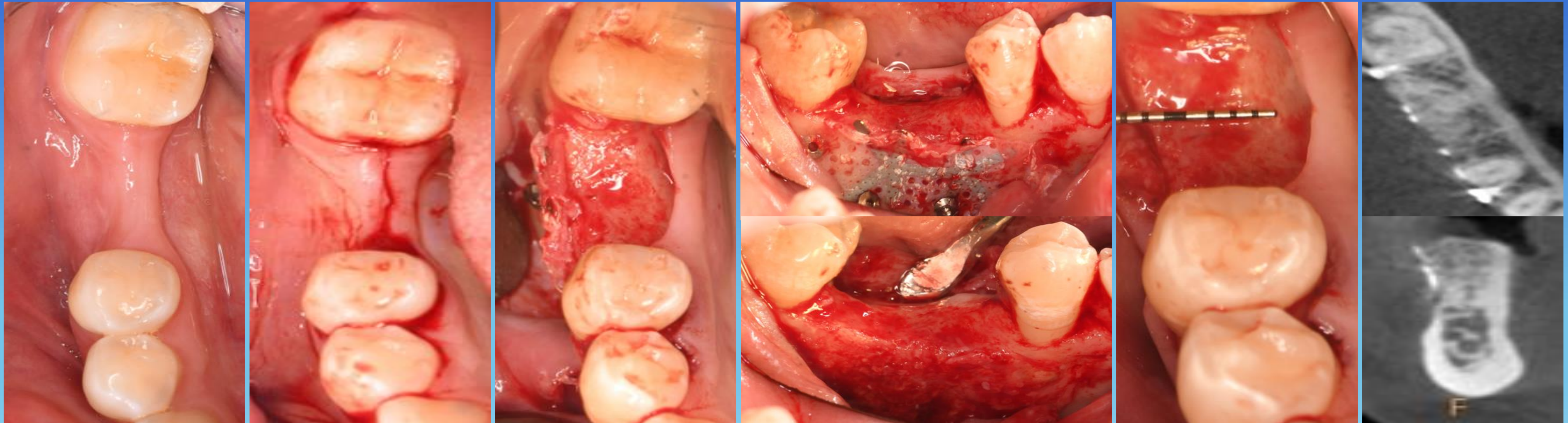
Horizontal Ridge Augmentation via the Shell Technique using a Titanium-Reinforced d-PTFE Membrane – A Case Report



Christian D. Davila, Samuel Smith, Arif Salman

Department of Periodontics, West Virginia University

Significant horizontal bone gain (+7mm) and mild vertical bone gain (+1mm) were measured via planning software. Intra-surgically, the periosteum had communicated through the pores in the dPTFE membrane, demonstrating adequate healing and vascularization to the graft from the buccal tissue. Following removal of the membrane and all tacks, an intact graft was unveiled with a ridge measuring 8.5mm bucco-lingually and 10mm mesio-distally, allowing sufficient space for implant placement.



Re-entry procedure performed at 9mo post-GBR with dissection of the flap from the intact membrane.

Membrane and tacks were removed, revealing mature, organized graft material and an increased B/L width for single implant placement.

CBCT showing 3-D increase in alveolar ridge width and height.

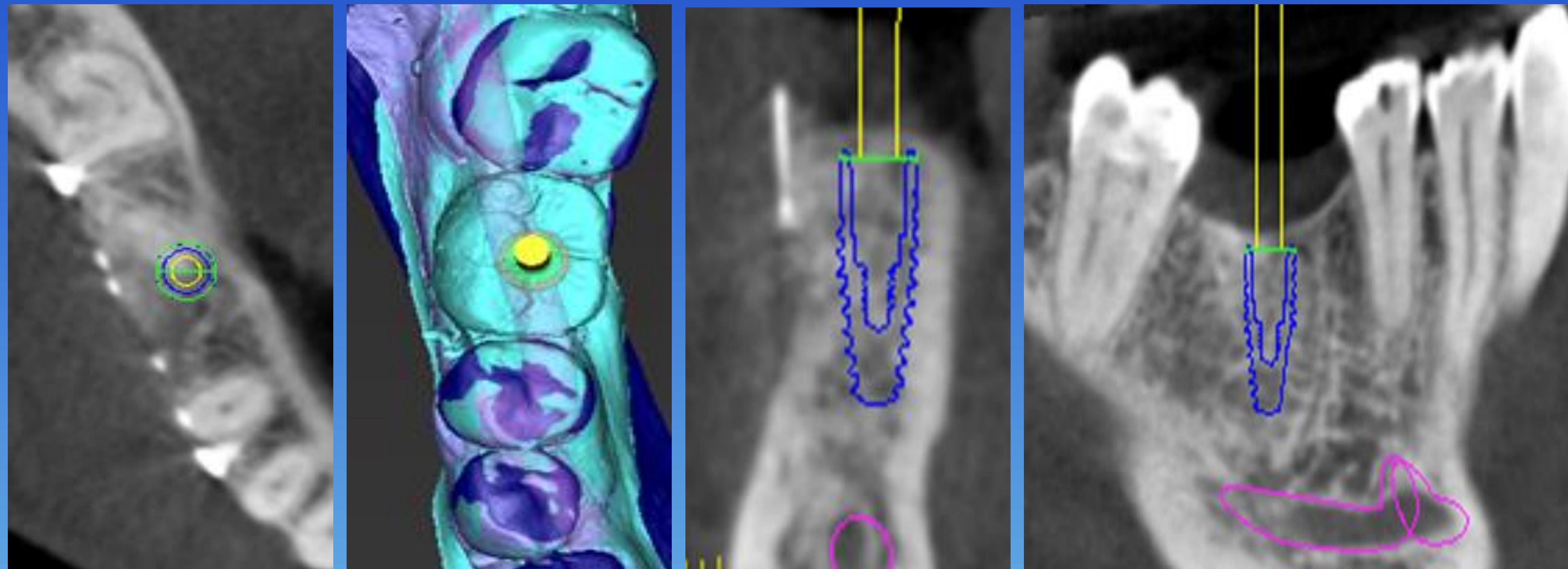


Horizontal Ridge Augmentation via the Shell Technique using a Titanium-Reinforced d-PTFE Membrane – A Case Report



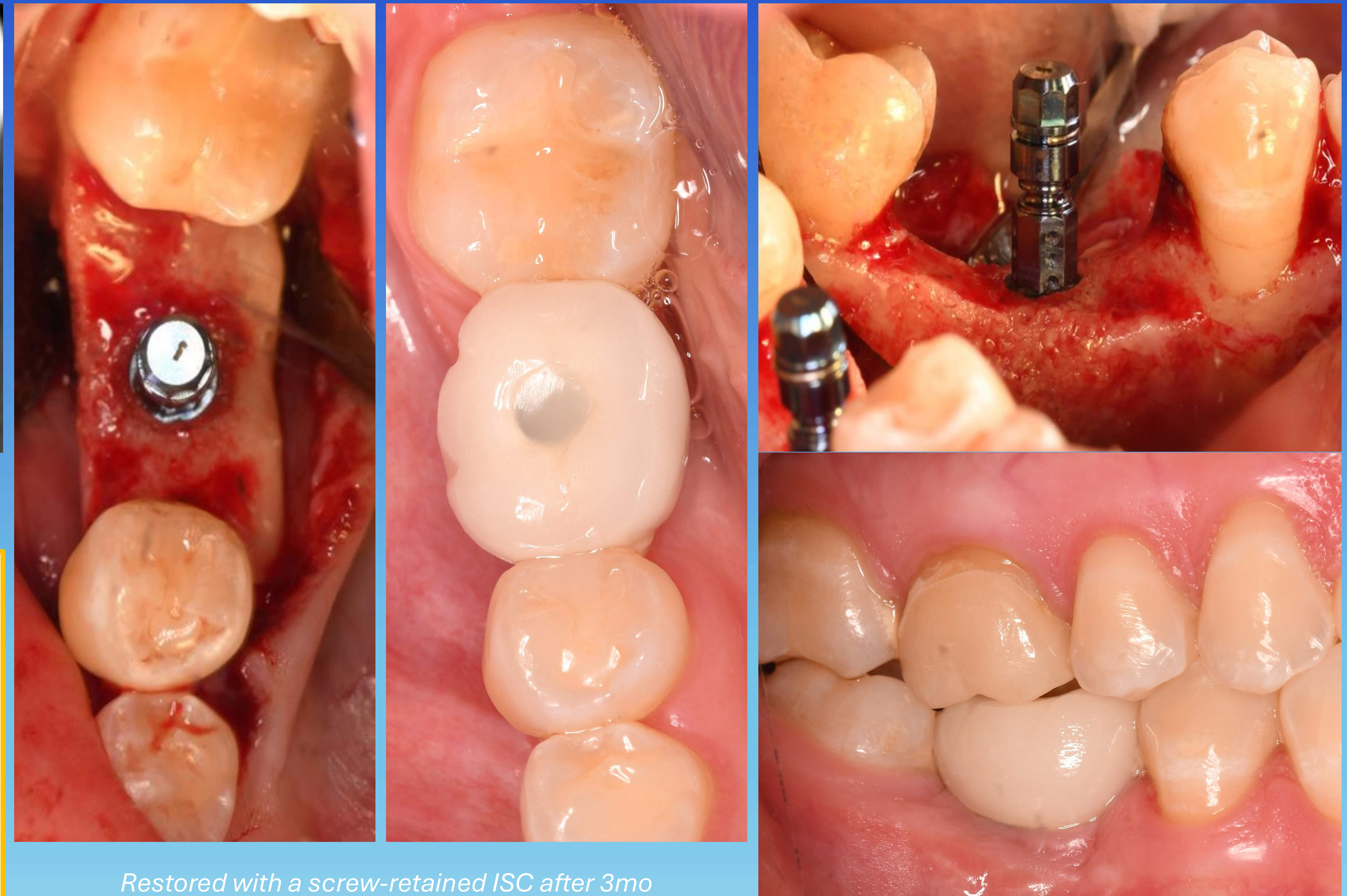
Christian D. Davila, Samuel Smith, Arif Salman

Department of Periodontics, West Virginia University



Implant planning via CoDiagnostix software for S-CAIS guided implant placement.

Conclusion: This report demonstrates that this less invasive approach of the shell technique using a dPTFE membrane can be a viable alternative treatment for horizontal ridge deficiencies.



Restored with a screw-retained ISC after 3mo