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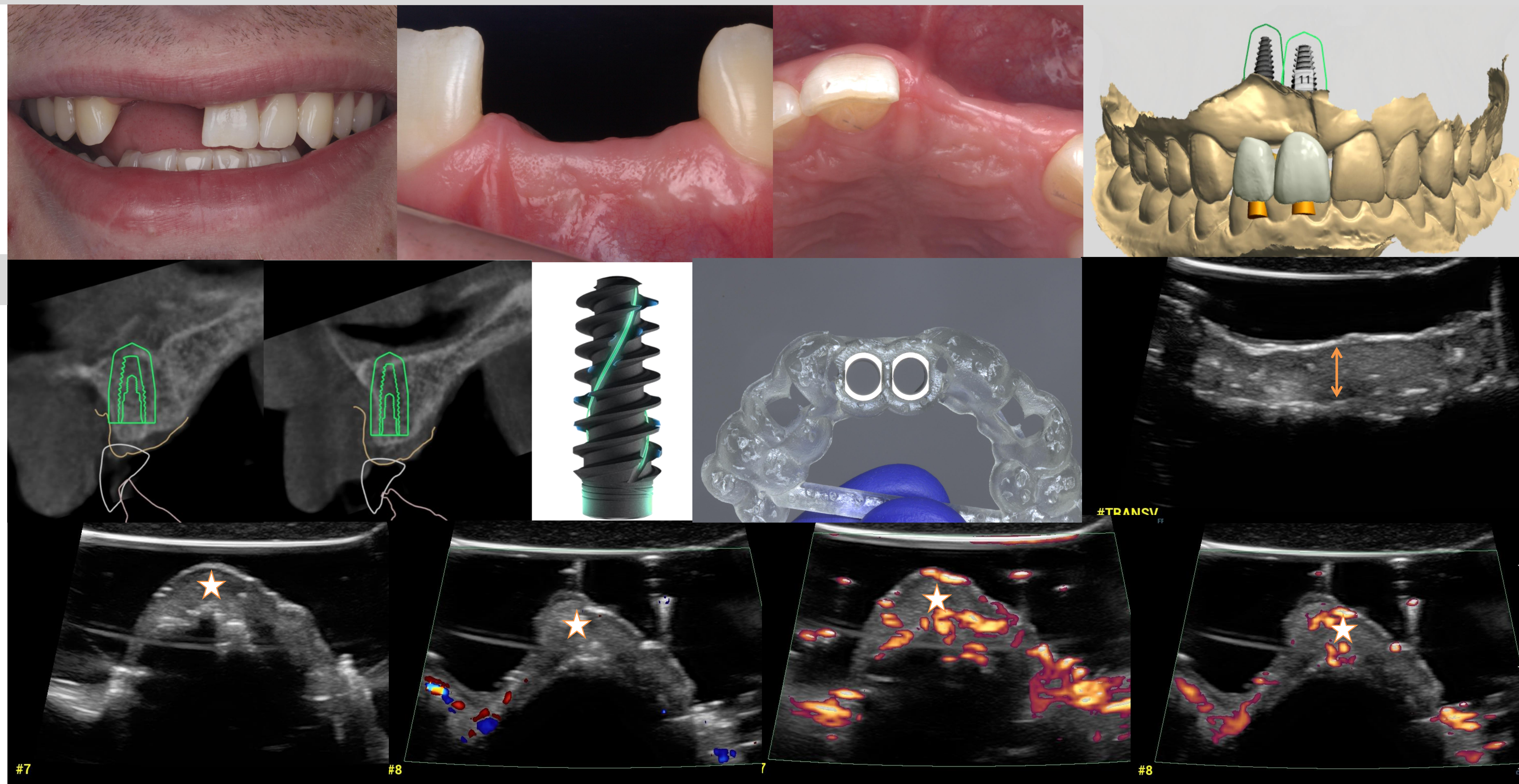
Case presentation

- ❖ A 23-year-old systemically healthy male with a history of trauma and missing maxillary right lateral and central incisors (#7 and #8) presented with esthetic concerns and localized ridge deficiency.

Clinical and radiographic examinations

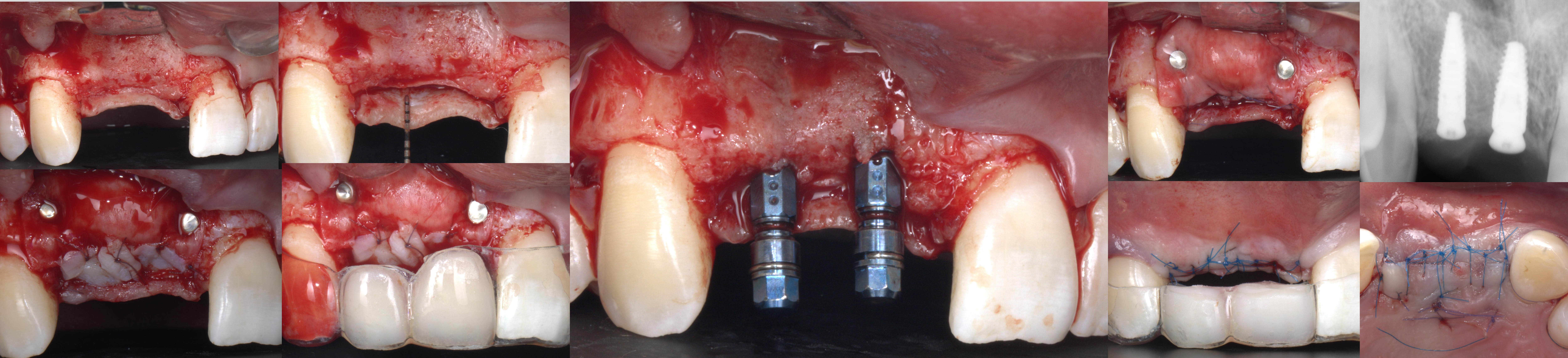
- ❖ Radiographic and clinical evaluations together confirmed a combined defect involving both the alveolar ridge and surrounding soft tissues corresponding to a Seibert Class III ridge deformity.
- ❖ Preoperatively, intraoral ultrasound revealed a thin buccal soft tissue phenotype with reduced mucosal thickness over the edentulous #7–8 site, corroborating the clinical impression of a deficient ridge.
- ❖ This case report describes simultaneous management approach aimed at reconstructing the anterior maxillary ridge to optimize implant-supported restoration and esthetic outcome.

Surgical planning and preoperative ultrasound site evaluation

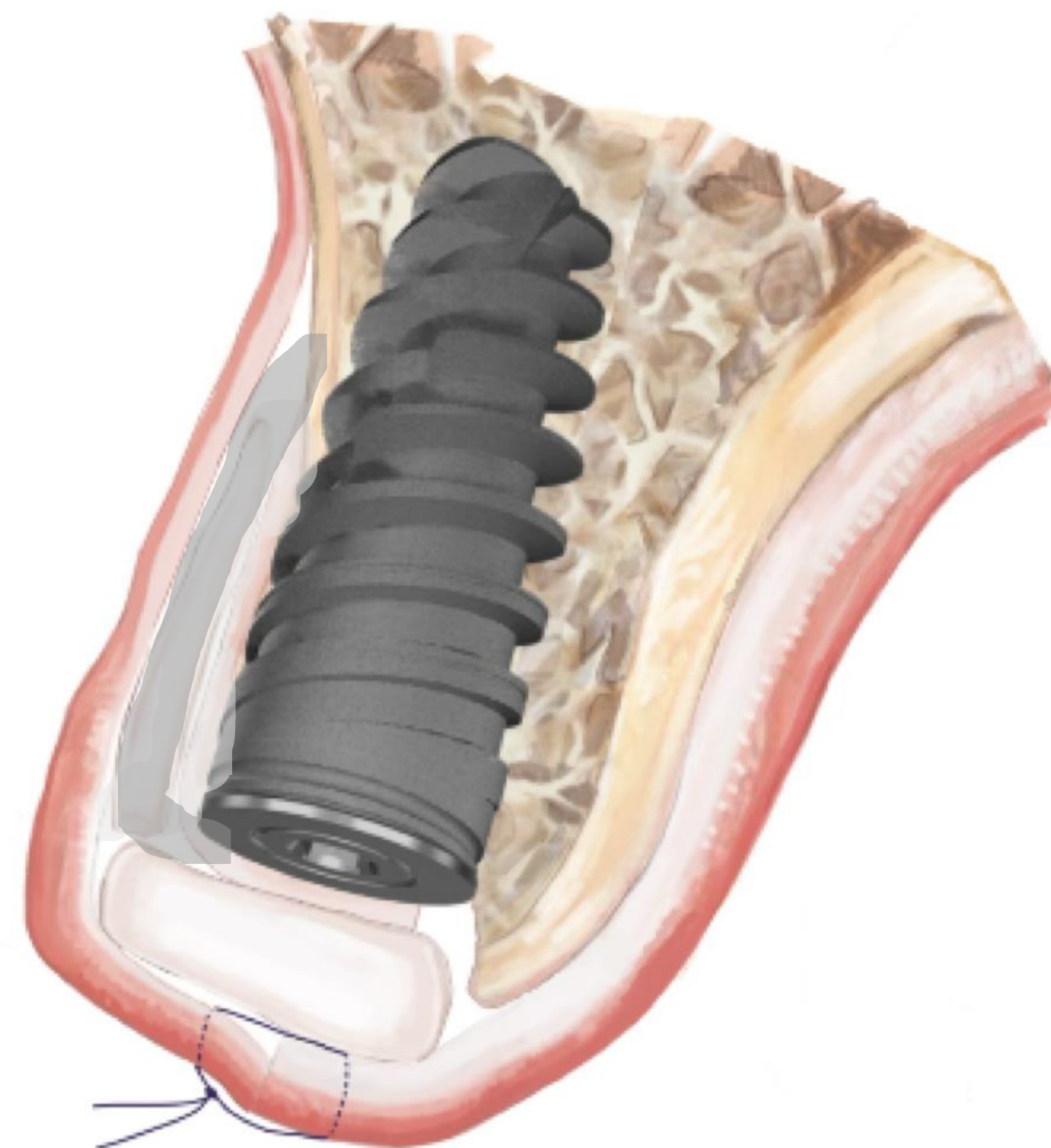


Color Doppler assessment showed adequate baseline blood flow within the buccal mucosa, indicating a relatively good vascular supply in the graft recipient area. These findings helped justify simultaneous soft tissue augmentation and provided a baseline for comparison during follow-up.

Surgical steps



- ❖ First-stage surgery will include simultaneous implant placement, guided bone regeneration, and vertical soft tissue augmentation at the #7–8 site. Under local anesthesia, a full-thickness flap will be elevated to expose the defect and allow placement of implants in a prosthetically driven position. The buccal defect will be augmented using particulate cortical allograft mixed with autogenous bone and covered with a resorbable collagen membrane.
- ❖ A palatal connective tissue graft will then be harvested and positioned over the implant crest and a tension-free coronally advanced flap to obtain vertical soft tissue thickening of at least 2–3 mm. Flaps will be sutured for complete primary closure, and the implant will be left submerged, with a healing period of approximately 4 months before second-stage surgery and provisionalization.





Surgical steps



❖ Second-stage surgery included implant uncover, buccal flap preparation, and placement of an inverted T-shaped palatal CTG to thicken the buccal contour and fill the inter-implant embrasure. Provisional screw-retained crowns were connected immediately and contoured to provide gentle support for the grafted tissues, guiding papilla formation and emergence profile during healing.

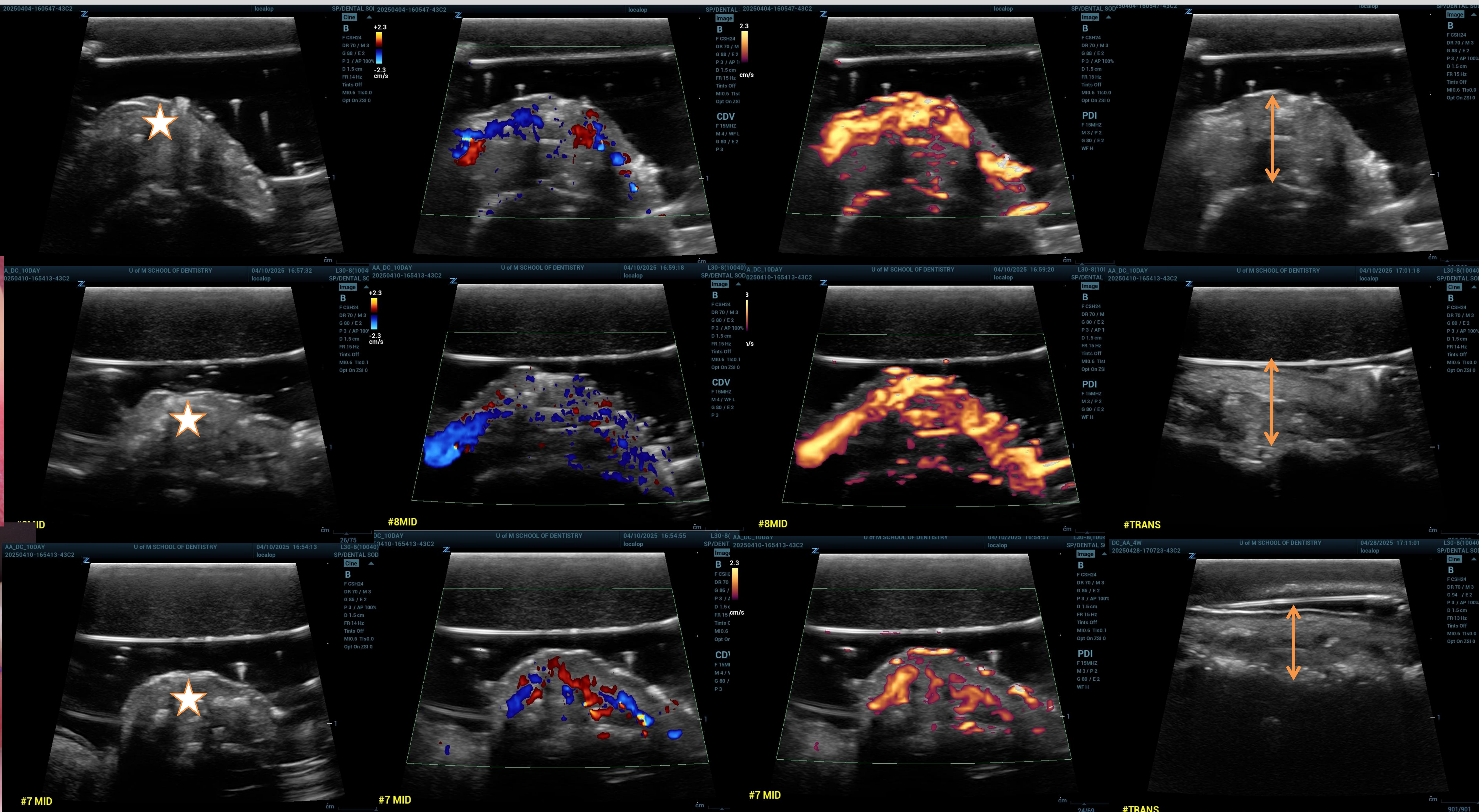
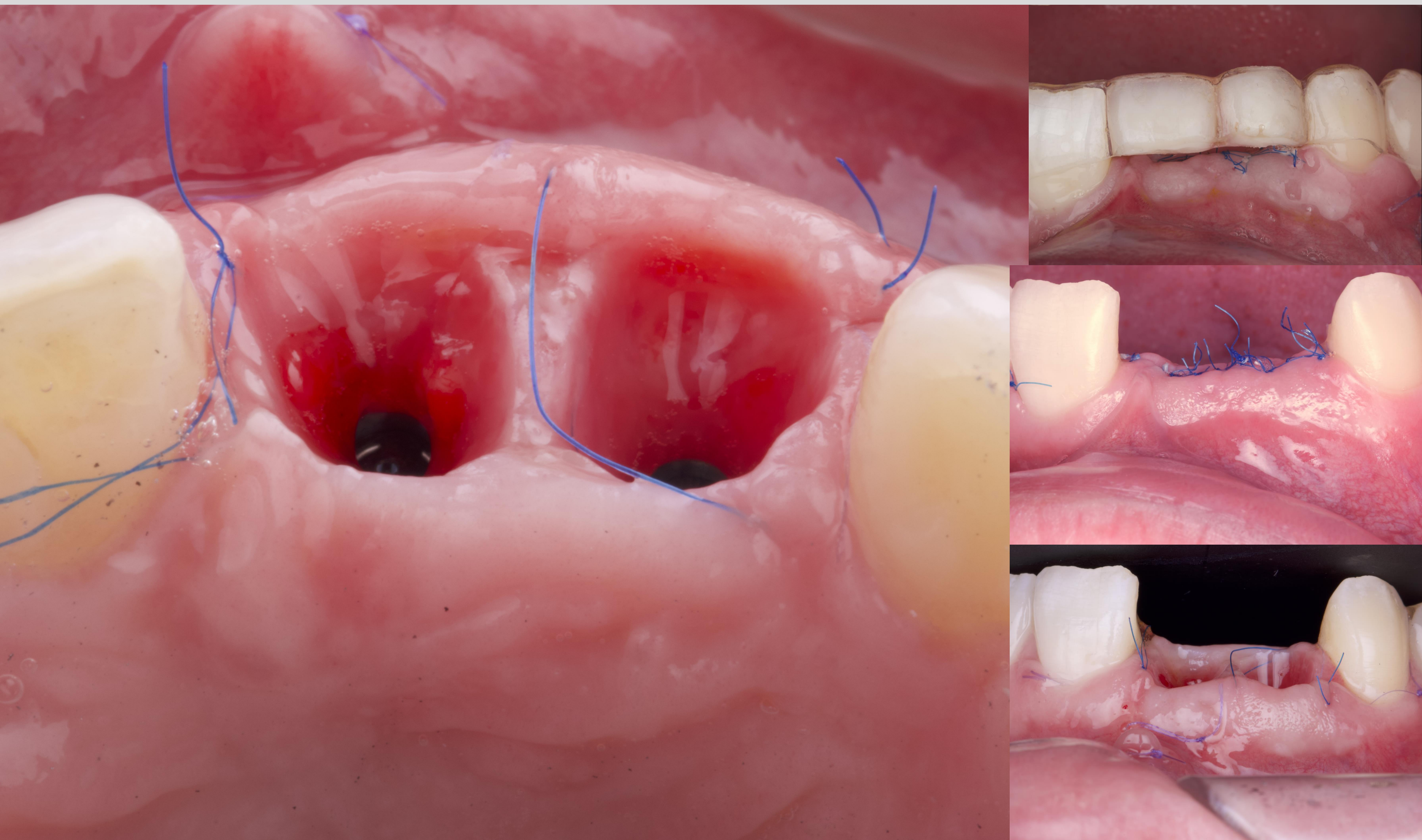




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Clinical follow-ups

US follow-ups



High-resolution intraoral ultrasound was used at multiple time points to monitor both hard- and soft-tissue healing after the first (implant + GBR + vertical soft tissue augmentation) and second (inverted T-CTG) surgeries, allowing non-invasive assessment of buccal plate thickness and mucosal volume changes over time. During the final follow-up, after soft-tissue conditioning with provisional crowns, ultrasound imaging was additionally employed to evaluate the height and thickness of the interimplant papilla, complementing clinical indices and photographs for three-dimensional papilla assessment.



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Three months re evaluation for interdental papilla maturation

- ❖ Different ultrasound modes were employed to characterize soft-tissue changes at the grafted site. B-mode imaging quantified buccal mucosal thickness and documented progressive soft-tissue gain over both implants.
- ❖ Color and power Doppler modes were used to visualize blood flow and early perfusion in the grafted area, demonstrating increased vascularization during the initial healing phase, consistent with successful integration of the soft-tissue and connective tissue grafts.

Conclusion

- ❖ Ultrasound provided a non-invasive, repeatable method to confirm soft tissue graft integration by simultaneously demonstrating stable thickness gain and adequate vascular perfusion at the grafted site.

Reference

Alrmali AE, Cury VF, Latimer J, Miller PD Jr, Wang HL. Inverted T-Shape Connective Tissue Graft for Interdental Papilla Reconstruction: A Clinical Case Series. *J Esthet Restor Dent*. Published online September 25, 2025. doi:10.1111/jerd.70035

