

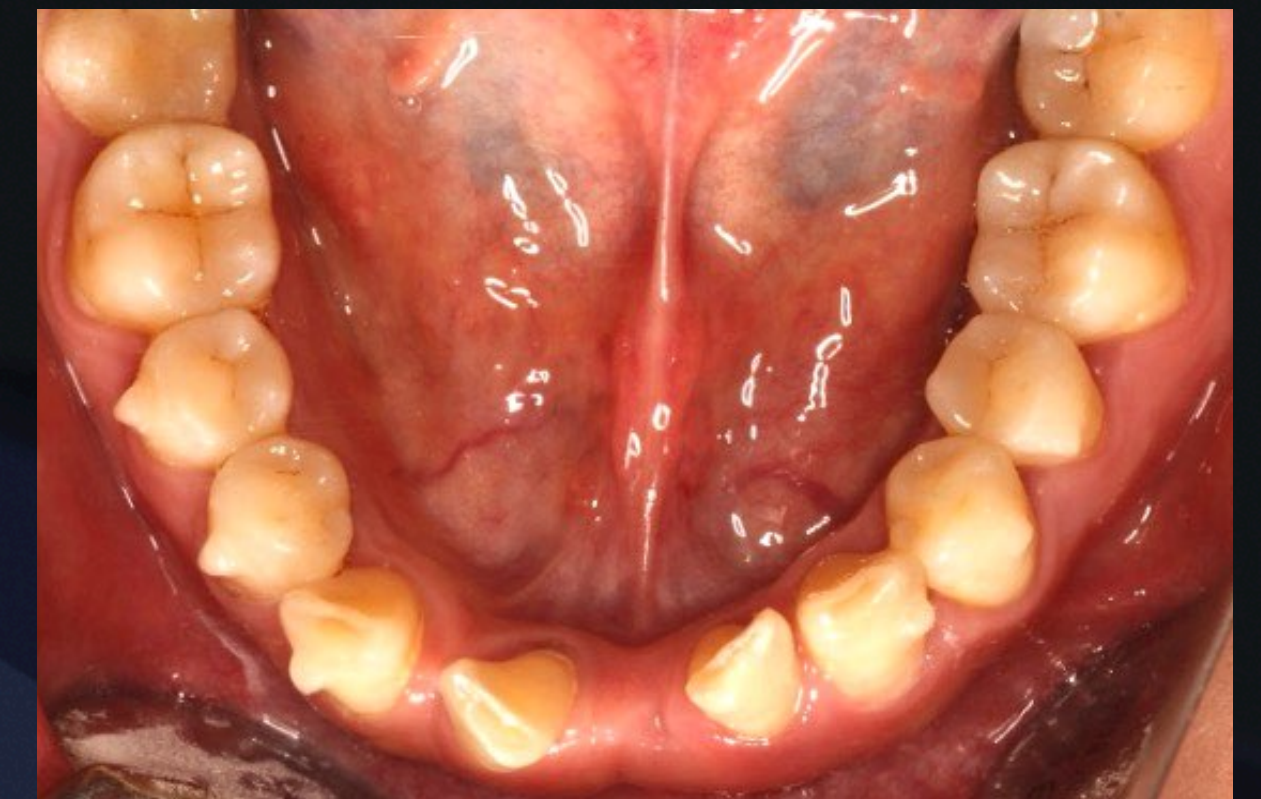
Orthodontic, Implant and Regenerative Approach to a Mandibular Anterior Defect: 5-year Outcome

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Introduction: Severe alveolar ridge defects in the mandibular anterior region—often resulting from congenital tooth absence and subsequent loss of primary teeth—present significant challenges for implant-based rehabilitation. The combination of limited space, horizontal bone loss, and complex site anatomy necessitates an integrated, multidisciplinary approach to achieve predictable hard- and soft-tissue outcomes.



Pre-orthodontic stage

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Stage I: Implant + GBR/GTR (simultaneous)

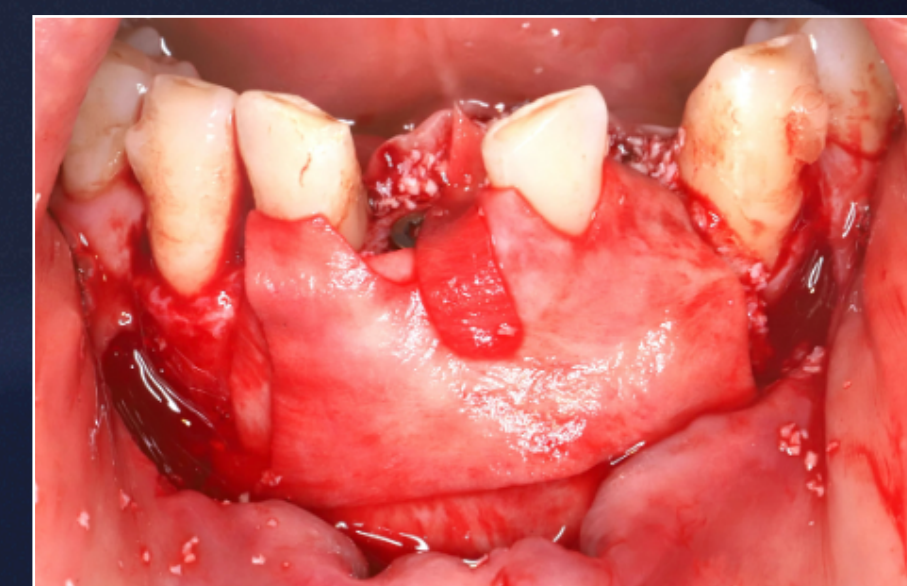
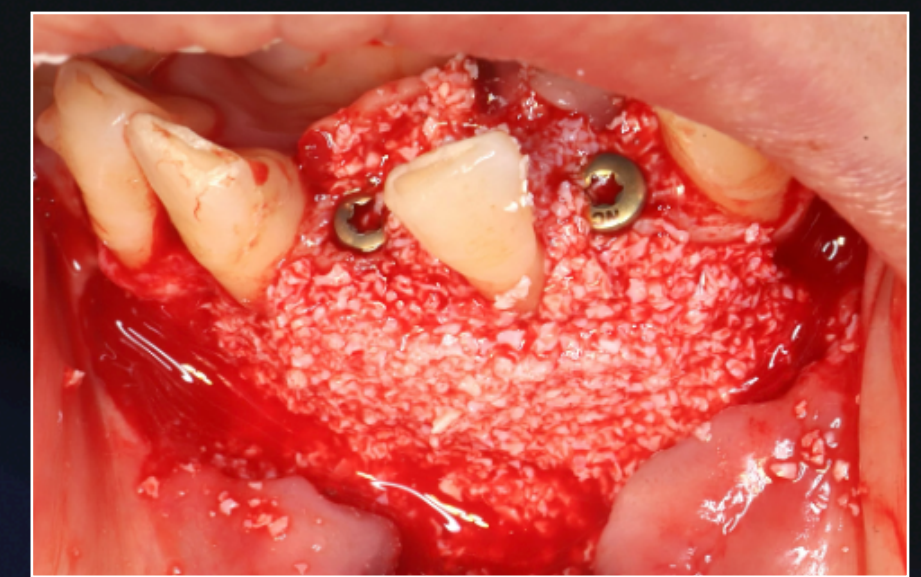
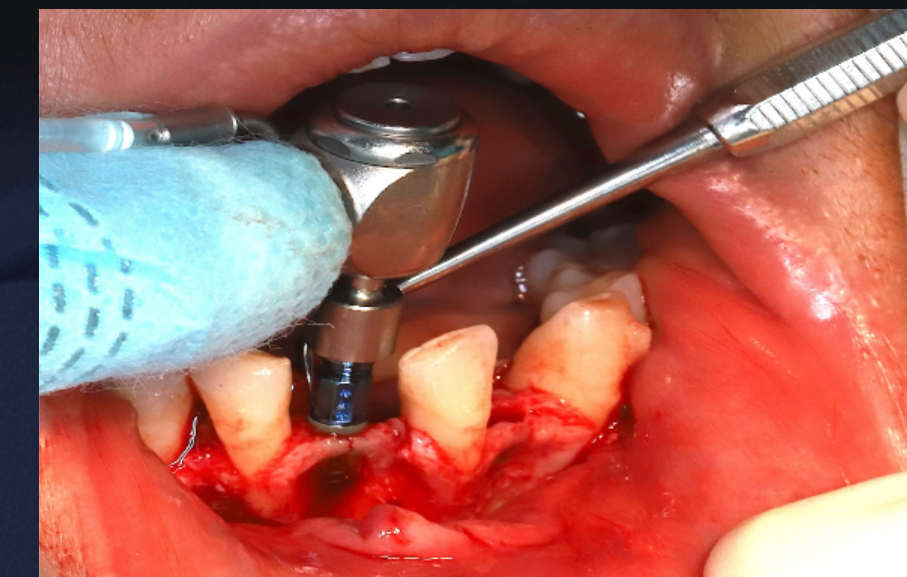
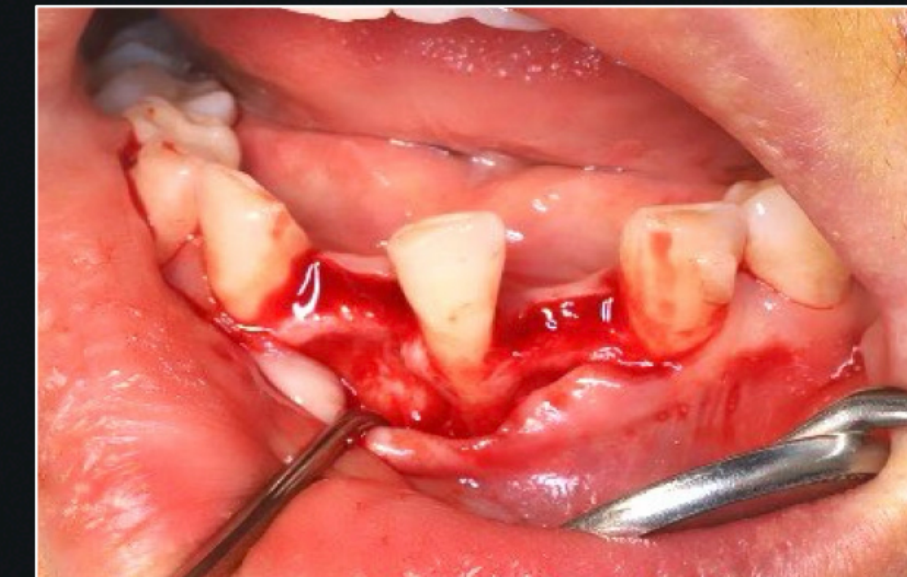
Methods: A 30-year-old female presented with significant spacing after exfoliation of a retained primary mandibular anterior tooth, with missing #24 and #26, distal rotation of #25, and a deep overbite/overjet.

Following 15 months of orthodontic space creation, severe horizontal ridge deficiency (approximately 6mm) was confirmed clinically and via CBCT. A single-stage regenerative protocol was performed: simultaneous guided bone regeneration (GBR) at implant sites (#23, #25) with bone level tapered implants and guided tissue regeneration (GTR) at adjacent natural teeth (#24, #26), utilizing deproteinized bovine bone mineral (DBBM) xenograft and an absorbable collagen membrane for multi-wall defect regeneration. Tension-free primary closure was achieved.

Preoperative



Preoperative-CBCT

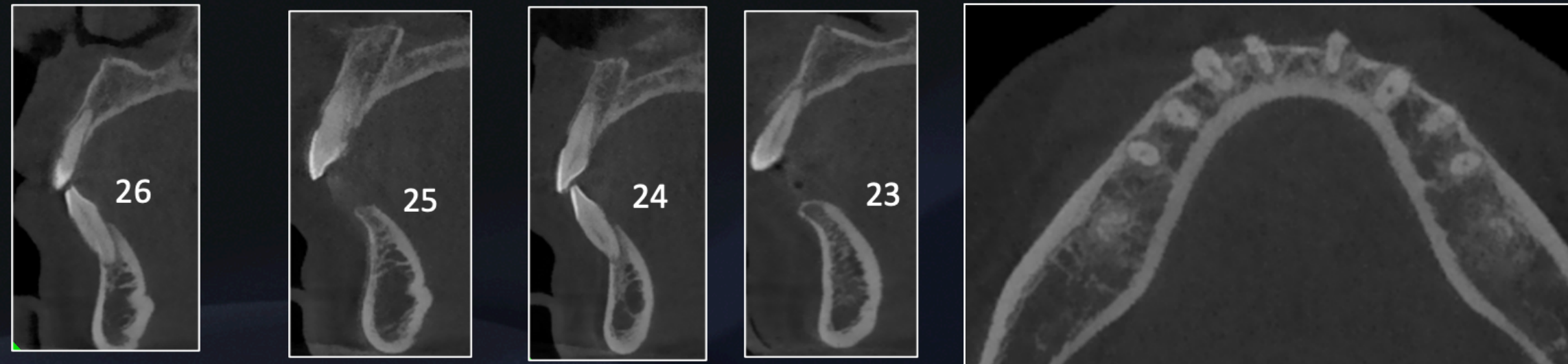


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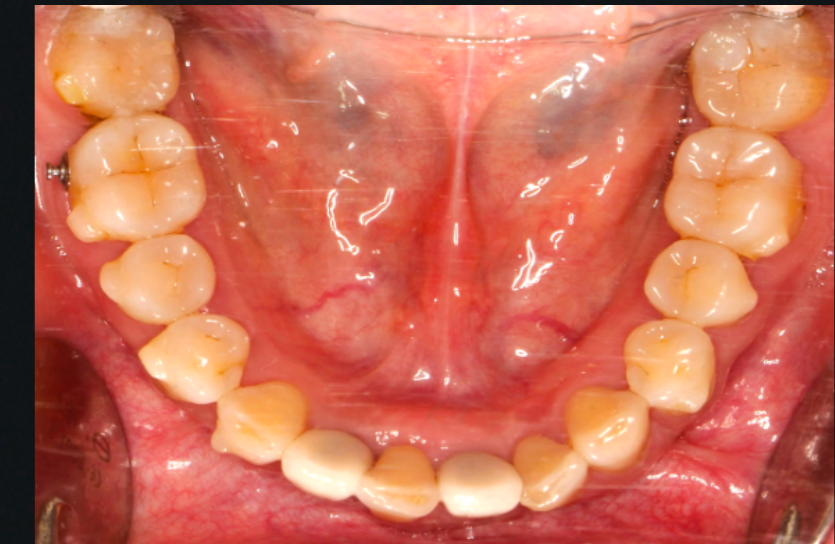
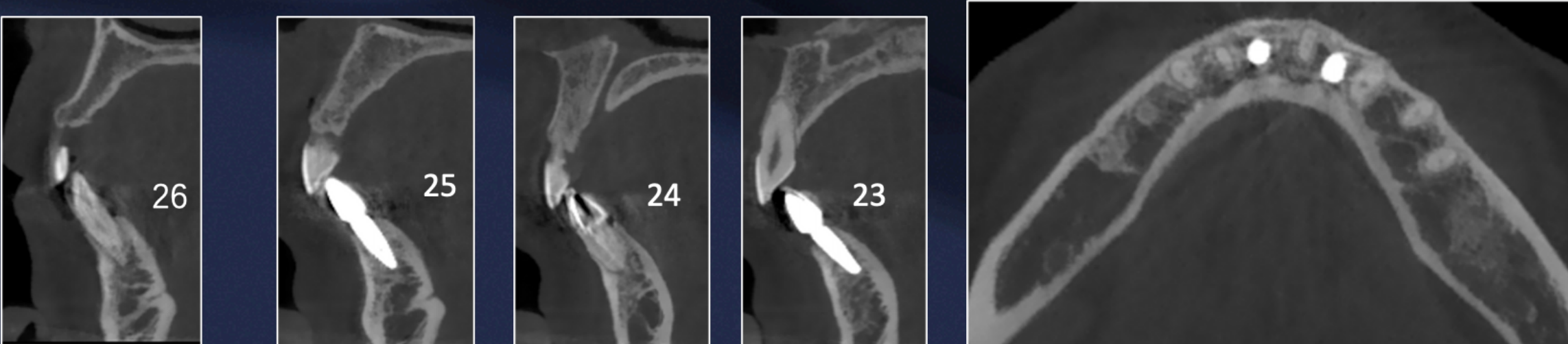
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Results: Healing was uneventful. Over five years, radiographic and clinical assessments confirmed stable bucco-lingual hard-tissue augmentation, increased keratinized mucosa, and healthy peri-implant soft-tissue contours. CBCT demonstrated robust lingual and buccal bone regeneration and thickness at both implant sites and natural teeth, with no mucosal or gingival recession and maintained bone volume.

Preoperative-CT



5-year follow up CT



2-year follow-up



5-year follow-up

Conclusion: This case illustrates that a coordinated approach combining orthodontic space creation with simultaneous GBR at implant sites and GTR at neighboring teeth, utilizing DBBM and collagen membrane, facilitates predictable, long-term rehabilitation of complex mandibular anterior defects. This strategy achieved symmetrical, three-dimensional bone augmentation and maintained stable functional and esthetic results over a five-year follow-up.

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