

Novel Technique of Peri-implant and Periodontal Interdental Papillae Reconstruction

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Introduction

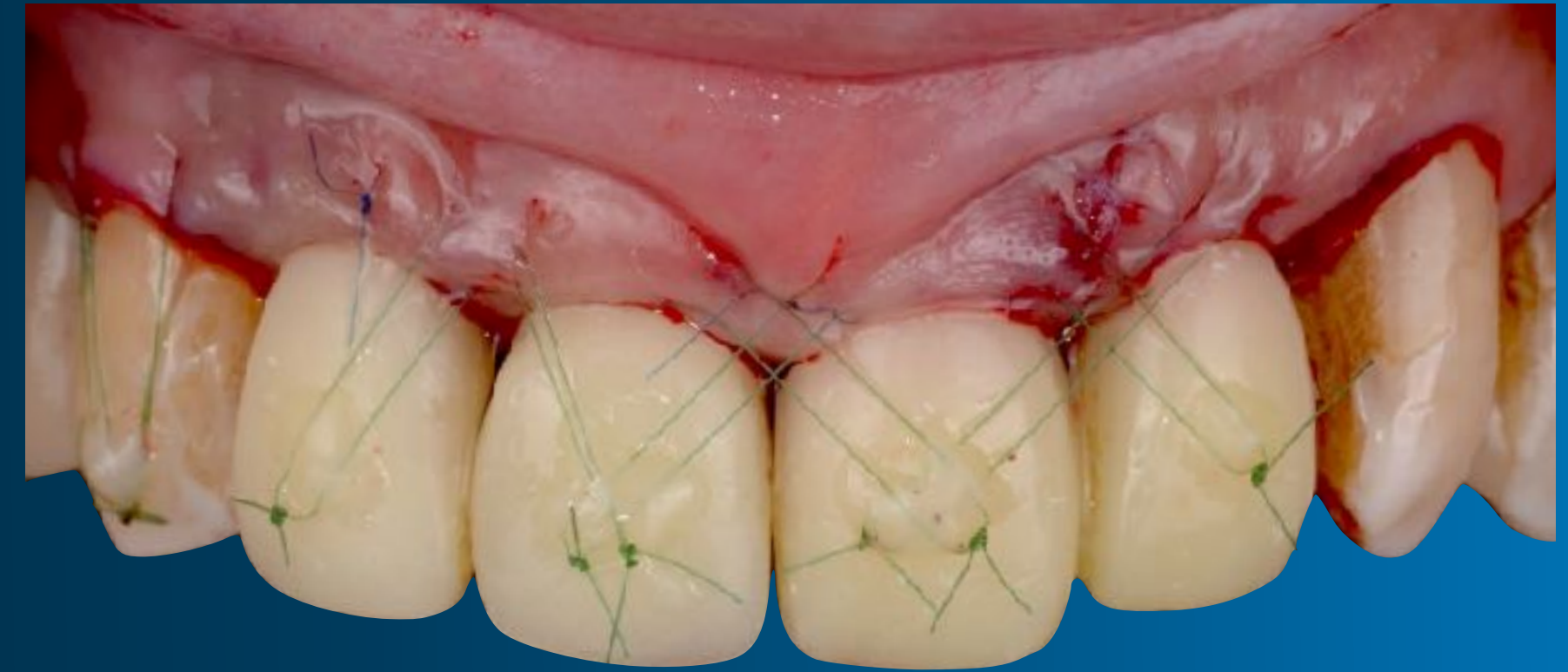
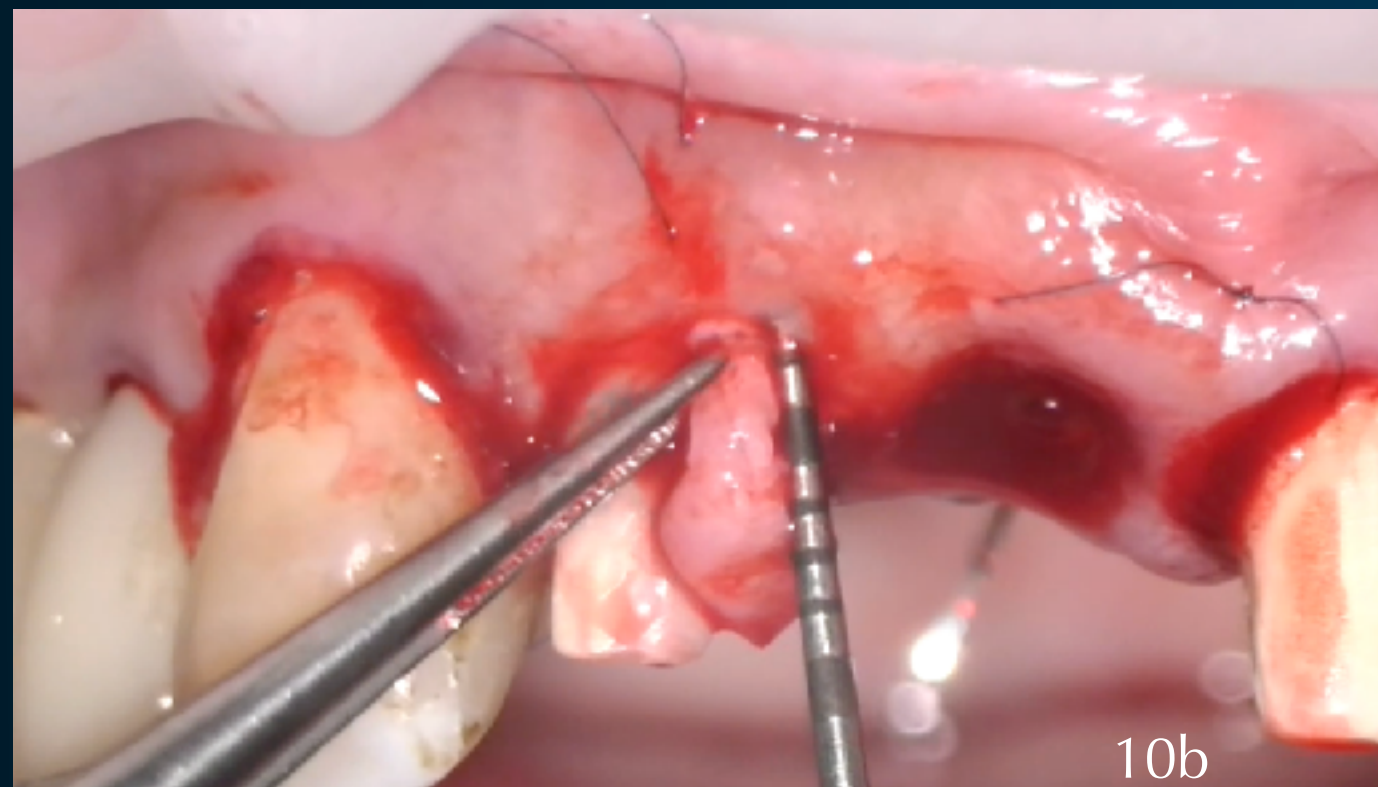
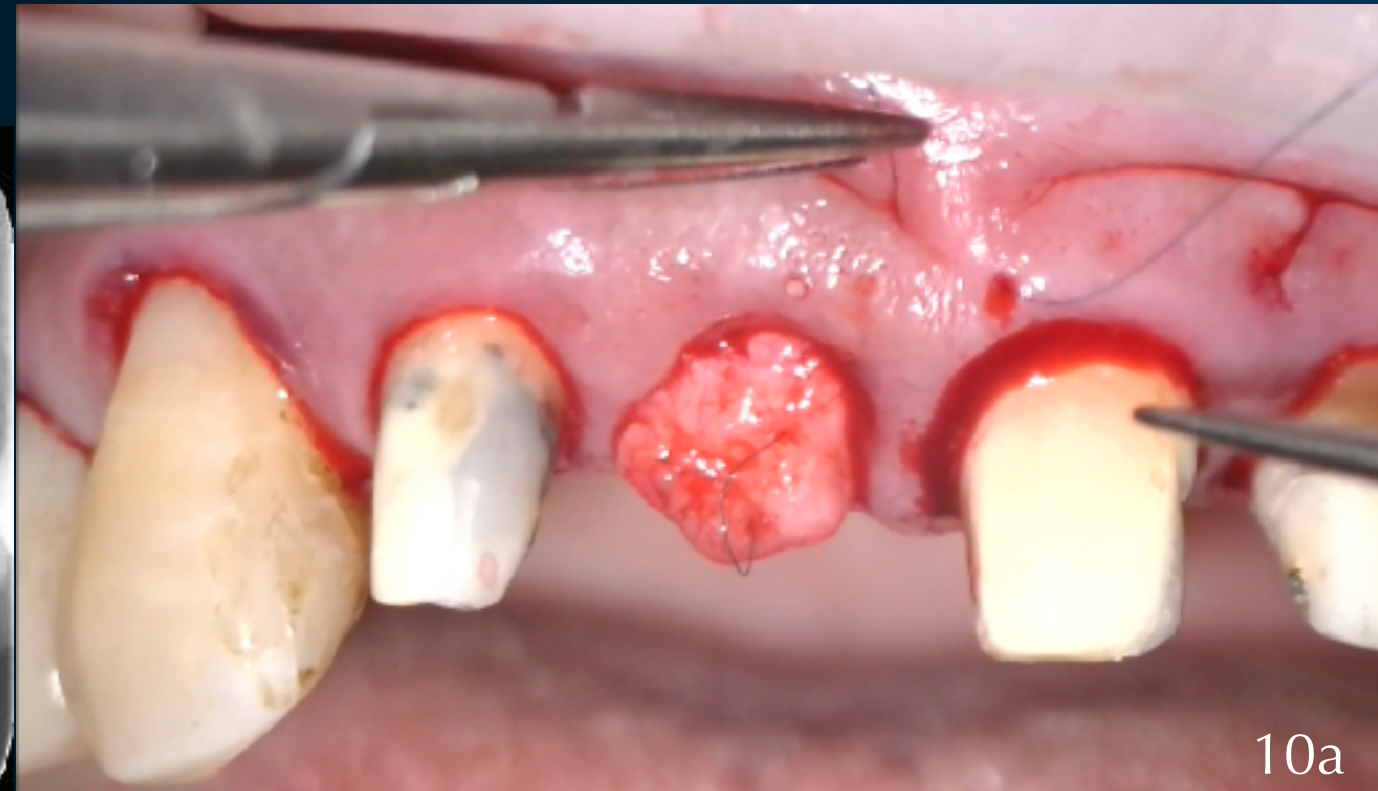
A technique to improve attachment loss in natural teeth by three-dimensionally elevating the flap and grafting connective tissue has been reported¹. However, there are no reports for implants. By grafting connective tissue three-dimensionally around the crown and implant, it was possible to create vertical structure not only in the periodontal tissue but also in the peri-implant tissue.



For the black triangles between #24-25 (Fig 1). a vertical incision was made 3mm below the interdental papillae of #23, #26, approximately 5mm horizontal incision 3mm below the interdental papilla of #24-25, and formed a full-thickness flap extending beyond the MGJ from #21 to #28, creating a three-dimensional tunnel (Fig 2). Subsequently, connective tissue from the tuberosity with FGF-2 was grafted below the interdental papilla, and connective tissue from the palatal gingiva was placed to the labial side (Fig 3a,b). Sutures were bonded with composite resin and suspended to elevate the flap coronally² (Fig 4). Uneventful healing was confirmed after surgery in 2 weeks (Fig 5).

Method

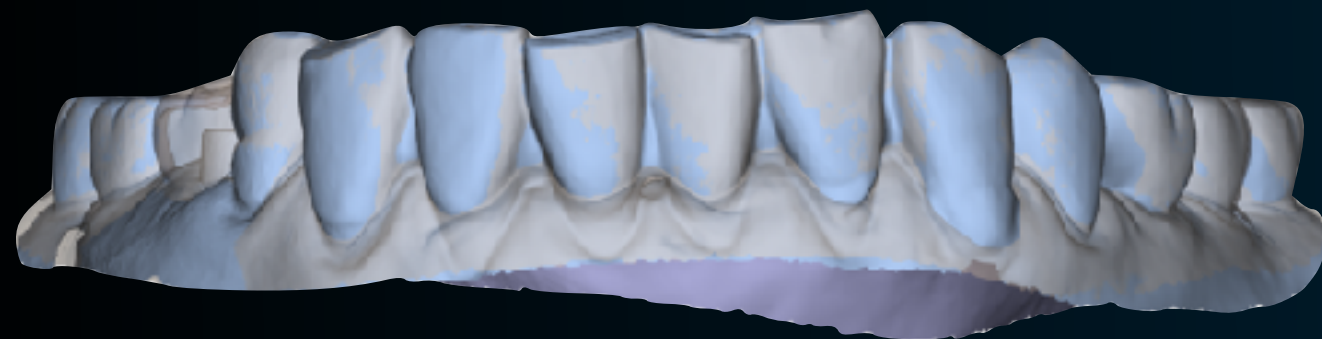
CASE 2



For the black triangles and attachment loss at #6-11 (Fig 6-8), a 5mm incision was made 3mm below the interdental papillae at #9 and #10. An additional incision was made around the implant at #9. A full-thickness flap was formed extending beyond the MGJ at #6-11, directly below the interdental papillae, and lingually. Tunneling was performed (Fig 9). Subsequently, connective tissue from the tuberosity coated with FGF-2 was grafted directly below the interdental papilla, and connective tissue from the palatal gingiva was grafted to the labial side (Fig 10a, b). The gingival flap was suspended by bonding the suture thread with composite resin for the purpose of elevating the gingival flap coronally² (Fig 11). uneventful healing was confirmed after surgery in 2 weeks (Fig 12).

Results The post-operative course for all cases was uneventful, resulting in the complete resolution of the black triangles. Papilla improvement was quantified by superimposing intra-oral scan data. In Case 1, the vertical tissue gain was 1.71 mm at site #26-25 and 2.55 mm at site #24-25. In Case 2, the gains were 2.28 mm at site #7-8 and 1.84 mm at site #8-9.

CASE 1



#24-25 : 2.55 mm

#26-25 : 1.71 mm



CASE 2



#7-8 : 2.28 mm

#8-9 : 1.84 mm



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Conclusion

Creation of three-dimensional tunneling flap design, combined with three-dimensional grafting of connective tissue from the densely structured maxillary tuberosity and connective tissue from the palate can be harvested over a large area has been shown to improve black triangles and enable vertical gingival augmentation.



Reference

1. Kazarian E, Inozemtseva K, Lebedeva E. A Novel 3D Tunneling (3DT) Surgical Technique for the Treatment of Gingival Recessions with Reconstruction of the Deficient Interdental Papilla and Interproximal Attachment Regeneration: A Case Series. *Int J Periodontics Restorative Dent*. 2025 Jan 24;45(1):31-45. doi: 10.11607/prd.6960.
2. Zadeh H. Minimally invasive treatment of maxillary anterior gingival recession defects by vestibular incision subperiosteal tunnel access and platelet-derived growth factor BB *Int J Periodontics Restorative Dent*. 2011 Nov-Dec;31(6):653-60.