

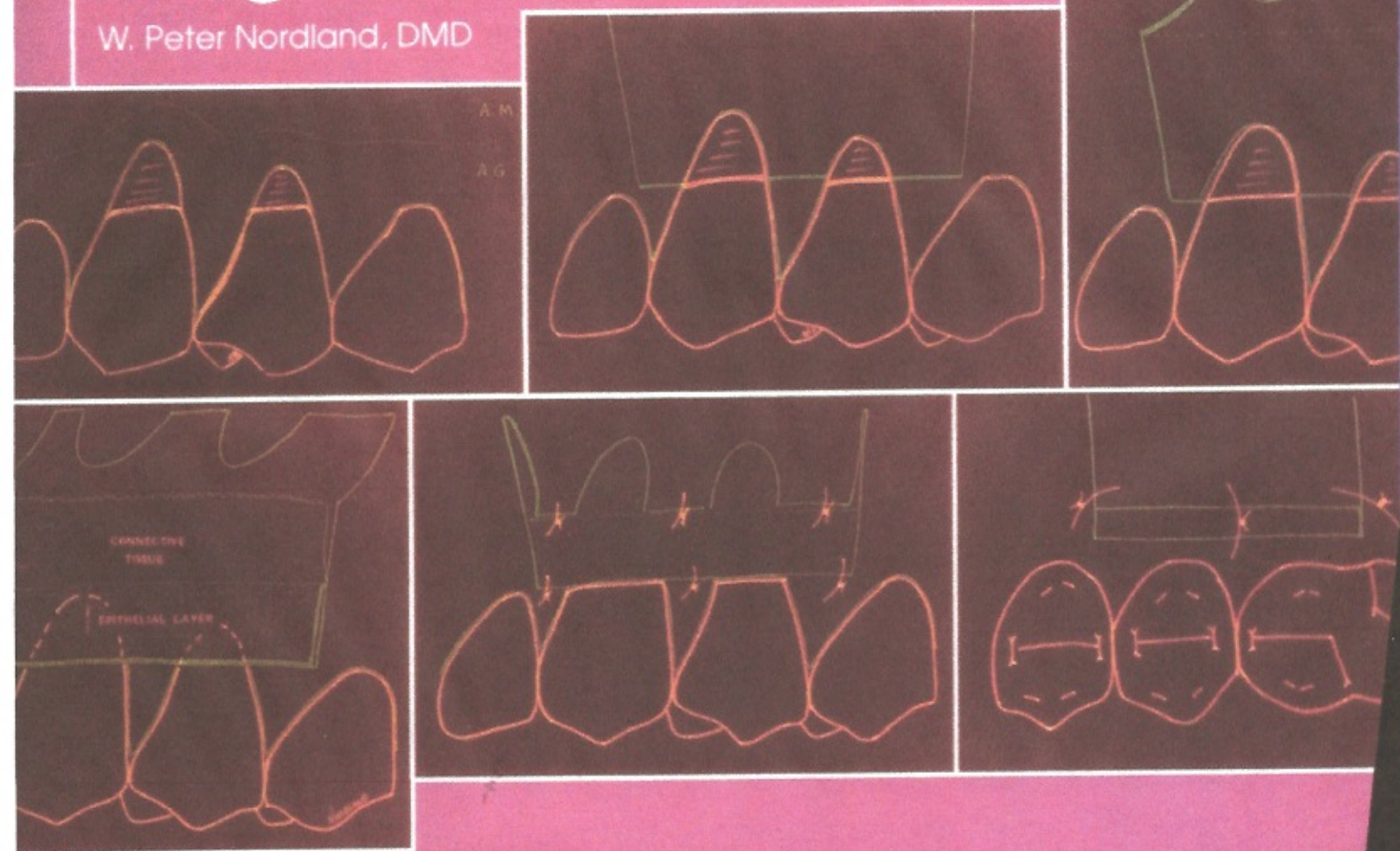
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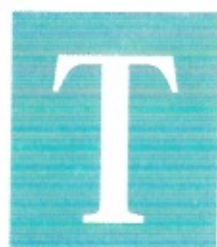
Esthetic Gingival Regeneration

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Periodontal Plastic Surgery: Esthetic Gingival Regeneration

W. Peter Nordland, DMD



Today's dentist often is faced with patients wishing to have esthetic enhancement of their smile. Occasionally, gingival recession creates an

aged, "long-in-the-tooth" appearance, as well as complaints of root sensitivity, a susceptibility to root caries, access for cervical abrasion and compromised esthetic restorative dentistry. This paper will demonstrate the potential in gingival regeneration for: 1) enhancing esthetic restorative dentistry; 2) correction of unesthetic gingival recessions; 3) the ability to cover previously exposed root surfaces to alleviate active periodontal disease; 4) eliminating dentinal root sensitivity; and 5) presenting an alternative to some Class V restorations.

Case I

A healthy 38-year-old female presented on referral from her general dentist, with a complaint of multiple dark spaces between her teeth (fig. 1) and occasional root sensitivity. She also complained of feeling she could not smile without covering her mouth. Her previous dentist had fabricated an acrylic gingival mask (fig. 2). Although she had localized advanced periodontitis, she had not previously seen a periodontist or had periodontal surgery. Her new referring dentist was concerned about her active periodontitis, the possible pressure atrophy of the acrylic gingival mask and the compromised ability to restore a natural smile utilizing either bonding or porcelain crowns due to excessively long teeth, loss of the interdental papillae and

large embrasure spaces.

Periodontal examination revealed localized advanced periodontitis with Class III furcation involvements, localized gingival recessions of 2 to 4 mm in the maxillary anterior and tooth migration.

The treatment plan consisted of controlling the active posterior periodontitis with detailed oral hygiene instruction, quadrant root planing with local anesthesia, periodontal surgery and a maintenance recall scaling every three months; periodontal regenerative surgery to cover the exposed denuded

root surfaces; orthodontic repositioning; and restorative dentistry.

The periodontal regenerative surgery began with vigorous root planing, followed by citric acid dentinal demineralization.^{1,2} (fig. 3) Using surgical optical magnification and fiberoptic illumination, a split-thickness facial flap was reflected from the mesial line angles of teeth numbers 6-11, to act as the recipient bed. (figures 4 & 5) A connective tissue graft³ was obtained from the palate, using a trap-door incision (fig. 6), followed by the removal of a section of graft tissue consisting of an



Figure 1. Initial pre-operative appearance of maxillary anterior recessions of 2mm—tooth #7, 4mm—tooth #8, 4mm—tooth #9 and 3mm—tooth #10.



Figure 2. Acrylic gingival mask in place.



Figure 3. Application of citric acid.



Figure 4. Flap design with releasing incisions at line angles of tooth #6 and #11 and horizontal split-thickness sulcular incision.

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Figure 5. Split thickness flap reflected.



Figure 6. Palatal "trap-door" incision.



Figure 7. Harvesting the epithelial-edged connective tissue graft.

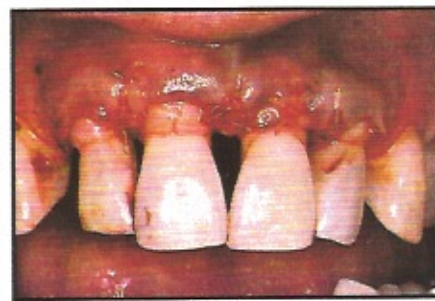


Figure 8. Sandwiched connective tissue graft sutured into position.



Figure 9. Healing: one week post-operatively.



Figure 10. Healing: one month post-operatively.



Figure 11. Orthodontic repositioning.



Figure 12. Porcelain-fused-to-metal crowns placed four years following periodontal plastic surgery.



Figure 13. Comparative pre-operative photograph.

epithelialized margin and underlying connective tissue. (fig. 7) Then the graft was positioned over the denuded root surfaces, with the epithelialized margin and underlying connective tissue portion sandwiched between the two halves of the split-thickness flap, then sutured in place. (fig. 8) Figures 9 and 10 demonstrate healing at one week and at one month. Orthodontic tooth movement was used to close the diastemas and rotate the teeth into a more favorable alignment. (fig. 11) Porcelain-fused-to-metal, full-coverage crowns were then placed, four years after initiating treatment. (fig. 12)

A comparison of pre-treatment appearance (fig. 13), with post-treatment appearance after periodontal

plastic surgery (fig. 12), demonstrates: 1) 1 to 3 mm of root coverage was obtained; 2) esthetic restorative dentistry was enhanced; and 3) recession of the gingiva has been arrested by thickening the facial gingiva and modifying the patient's home care techniques.

Case II

A 24-year-old, healthy male presented on referral with a complaint of "having a fang." (fig. 14) The exposed roots could be covered with dentinal bonding. However, the tooth would still appear long. Figure 15 represents the treated case six weeks following connective tissue grafting with citric acid root demineralization, with no probe-

able pocket depth. The illustrations in figures 16-23 represent the steps involved in this case. Since teeth numbers 11 and 12 had severe cervical abrasion, odontoplasty of the overhanging enamel ledge was performed.

This case demonstrates that, as an alternative to dental bonding, severe cervical abrasions and severe deep-wide recessions can be corrected in a one-step periodontal plastic surgical procedure. The result is a wide band of protective attached keratinizing gingiva, which is non-probeable and aesthetic.

Case III

A 55-year-old healthy female was referred for treatment of advanced peri-

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Figure 14. Initial pre-operative appearance with 4 1/2mm recession tooth #11 and 2 1/2mm recession tooth #12.



Figure 15. Six weeks post-operatively following connective tissue grafting and root demineralization.

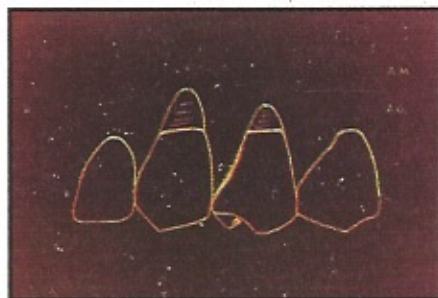


Figure 16. Pre-operative illustration: AM=Alveolar Mucosa, AG=Attached Gingiva.

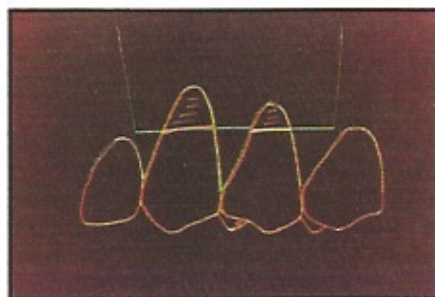


Figure 17. Initial incision design.

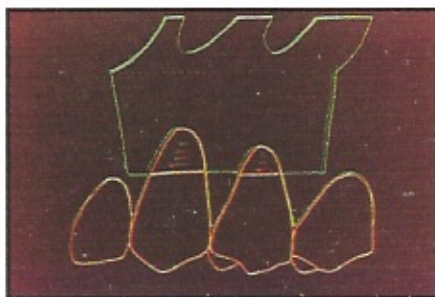


Figure 18. Split-thickness flap reflection.

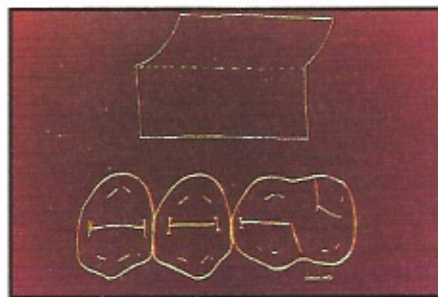


Figure 19. Palatal "trap-door" incision reflected.

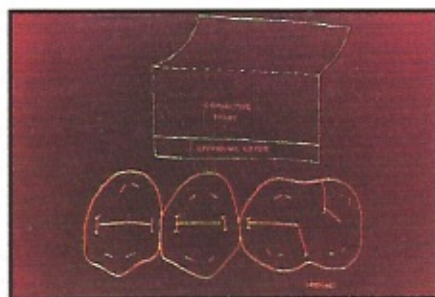


Figure 20. Palatal flap reflected with epithelial edged connective donor to be harvested.

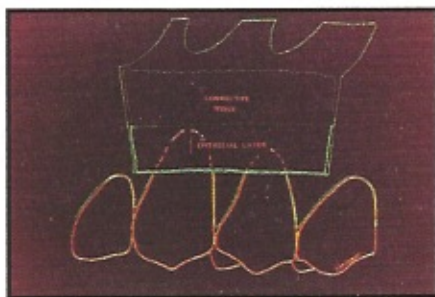


Figure 21. Epithelial edged connective tissue graft in place at recipient site.

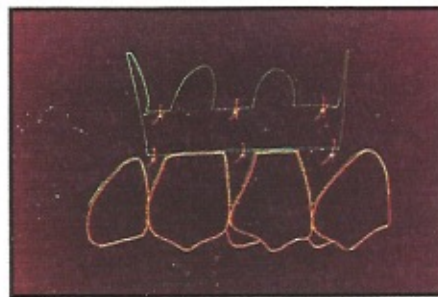


Figure 22. Graft sandwiched and sutured into position.

odontitis. Although she was not aware that she had periodontal bone loss, she was "very aware and concerned about the recession of the gum on the lower front tooth." (fig. 24)

Periodontal examination revealed generalized moderate to advanced periodontitis. Tooth number 25 had 4 1/2 mm of facial gingival recession, no attached keratinizing gingiva and 5 mm of facial probing pocket depth, making a total of 9 1/2 mm of attachment loss.

This case was treated, as described in Case II, with a connective tissue autograft and citric acid root preparation, yielding a result as seen in figures 25 and 26. This case demonstrates: 1) the ability exists to correct unesthetic gin-

gival recessions in a one-step plastic surgical procedure; and 2) the potential exists to cover previously exposed pathologically diseased root surfaces with a significant gain in clinical probing attachment.

Case IV

A healthy, 32-year-old female presented for treatment specifically for a "sore, sensitive lower tooth, that seemed to have gum recession occur overnight."

Periodontal examination revealed localized gingival recession of 5 1/2mm with no keratinizing gingiva. With an additional 3mm of probing depth, the total probing attachment loss was 8 1/2mm. Moderate amounts of calculus

and inflammation were present, as well as dentinal hypersensitivity. (fig. 27)

This case was treated, as described in the previous cases, with a connective tissue autograft, using citric acid to prepare the root surface. The result, as seen in figures 28 and 29, demonstrate: 1) highly esthetic results are possible; 2) dentinal root hypersensitivity can be significantly reduced or completely eliminated; and 3) root coverage can be achieved over areas of pathologically involved attachment loss.

Discussion

Periodontal plastic surgery involving functional esthetic gingival regeneration is possible. Regeneration can be

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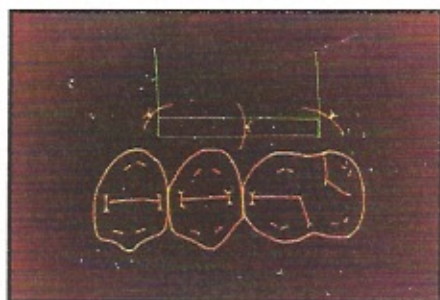


Figure 23. Palatal wound sutured.



Figure 24. Pre-operatively tooth #25 had 4 1/2mm recession and an additional 5mm of probing pocket depth-9 1/2mm total facial attachment loss.



Figure 25. Six months post operatively.



Figure 26. Six months post operatively, sulcus depth=2mm represents a 7 1/2mm gain in probing attachment level.



Figure 27. Pre-operative appearance of tooth #24 with 5 1/2mm gingival recession, no attached keratinizing gingiva and 3mm of probing pocket depth. 8 1/2mm of total attachment.



Figure 28. Four month post operative view.



Figure 29. Four month post operative view. Note: attached gingival coverage to original cemento-enamel junction.

accomplished even if root surfaces have been chronically exposed to bacterial endotoxins and calculus. This new attachment recreates the gingival unit, with the formation of new cementum and the insertion of connective tissue fibers. Once regeneration is accomplished in areas of previous recession, minimal sulcus depth can be expected.

The public is acutely aware of esthetic, cosmetic plastic surgery due to media coverage. (Case IV appeared on KABC-TV Medical Update, with Dr. Art Ulene, as an example of esthetic regeneration.) Now the challenge exists for the periodontist to recreate lost anat-

omy to a new level. This can be accomplished to such a degree that it also will challenge the referring restorative dentist, hygienist and patient to be unable to detect where the original defect once existed.

When total regeneration of the gingival unit can be attained, back to the cemento-enamel junction, the root dentinal sensitivity will be eliminated, as will the likelihood of root caries. Additionally, once a more natural gingival architecture can be created, then the restorative efforts are made easier and allow a more ideal result to be achieved.

Summary

A periodontal plastic surgical technique for esthetic root coverage is presented. Several cases are discussed to demonstrate possibilities to enhance restorative dentistry, correct unesthetic gingival recessions, eliminate dentinal root sensitivity and present an alternative to some Class V restorations. **CDA**

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Author

Dr. Nordland is in private practice in San Diego, California, and lectures nationally on Periodontal Plastic Surgery.

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