

The Use of DynaMatrix® Extracellular Membrane for Gingival Augmentation:

A Case Series

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LOCALIZED RECESSION ON TOOTH #25 DUE TO BONE RECESSION (PRE-OP)

Introduction

Tissue grafting procedures that increase the amount of attached gingival tissue or cover exposed root surfaces may accomplish any number of objectives: the prevention of further root exposure, decreased or eliminated sensitivity, decreased susceptibility to root caries and improved cosmetics. Clinicians have used various methods to build the zone of attached keratinized gingiva, including autogenous gingival or connective tissue grafts, freeze-dried skin allografts, and acellular dermal matrix. These methods have yielded a variety of results, and each present clinical trade-offs.^{1,2,3,4,5,6} For example, autogenous soft tissue grafts have demonstrated clinical efficacy but require a harvest site that adds to patient discomfort and can increase the likelihood of complications.

A recent study conducted at the Harvard School of Dental Medicine demonstrated the clinical efficacy of DynaMatrix® Extracellular Membrane, a material derived from intact extracellular matrix (ECM), in increasing the width of attached keratinized gingival tissue.⁷ This study compared treatment utilizing a free gingival graft vs. DynaMatrix® and found both techniques produced a significant increase in the amount of keratinized gingival tissue and generated tissue that was comparable histologically. Importantly, the study concluded that DynaMatrix® blended well with the surrounding tissue and produced a superior aesthetic outcome when compared to the autogenous graft. This study also further suggested that DynaMatrix® should be considered for patients with recession-type defects.



DYNAMATRIX® APPLICATION 6 MONTH POST-OP DEMONSTRATING EFFECTIVE ROOT COVERAGE

The following seven case studies were documented during 2009 and 2010 in central Virginia. These studies demonstrate the use of DynaMatrix® for recession-type gingival defects.*

Methods

Seven patients were selected for this study, each with varying degrees of soft tissue recession and bone loss. Patients were selected due to severity of defects and an interest in saving the affected teeth.

A five-step surgical method was adopted for the majority of patients in this case study:

1. An incision exposing the root was created.
2. DynaBlast™ Putty or Paste, or Accell® Bone Grafting Material was packed into site around the root.
3. Dry DynaMatrix® was positioned around the exposed root and hydrated with blood.
4. Adjacent soft tissue was positioned either coronally or laterally. The flap design was determined on a case-by-case situation.
5. DynaMatrix® was sutured to surrounding tissue, generally with 4.0 dissolving sutures, and left exposed.

The healing of each patient was evaluated several times over the course of the following months, typically 9-10 days post-surgery and again within 6 months. Clinical images were taken and reproduced with the patients' consent.

Results

Case 1: Localized Recession and Severe Bone Loss.

Patient presented with localized recession and severe bone loss on tooth #25. A flap was created to expose the root and bone, and DynaBlast™ was packed around the roots. DynaMatrix® was placed around the exposed root and hydrated with blood. Adjacent tissue was laterally positioned and then DynaMatrix® was sutured into place. Nine days post operative patient showed substantial tissue development with excellent healing. Six week post op showed continued development of root coverage. Six month post op showed fully developed keratinized tissue and a successfully covered exposed root.



CASE 1, FIG. 3: DynaBlast™ packed around exposed roots.



CASE 1, FIG. 1: Localized recession on #25 due to bone loss.



CASE 1, FIG. 4: DynaMatrix® placed and hydrated with blood.



CASE 1, FIG. 2: Vertical Flap created to expose root and bone.
Note: severe bone loss on #25.



CASE 1, FIG. 5: Laterally positioned adjacent tissue and sutured DynaMatrix® into place. DynaMatrix® is left exposed.



CASE 1, FIG. 6: 9 days post-op with tissue development.



CASE 1, FIG. 7: 6 weeks post-op with significant tissue development and normal healing.



CASE 1, FIG. 8: 6 month post-op with developed keratinized tissue and successfully covered exposed root.

Case 2: Root Coverage and Development of Keratinized Tissue. Patient presented with localized recession and insufficient keratinized soft tissue with frenum pull on tooth #24. A flap was created to expose the root, and DynaMatrix® was placed and hydrated with blood without the use of any bone grafting material. Adjacent tissue was laterally positioned and DynaMatrix® sutured into place. Nine days post operative patient showed substantial tissue development with excellent healing. Two week post op showed continued development of root coverage. Two month post op (not pictured) showed developed keratinized tissue.



CASE 2, FIG. 1: Tooth #24 has localized recession and insufficient keratinized soft tissue with frenum pull.



CASE 2, FIG. 2: Vertical flap created to expose roots.



CASE 2, FIG. 3: DynaMatrix[®] placed and hydrated with blood.



CASE 2, FIG. 4: Laterally positioned adjacent tissue and DynaMatrix[®] sutured into place.

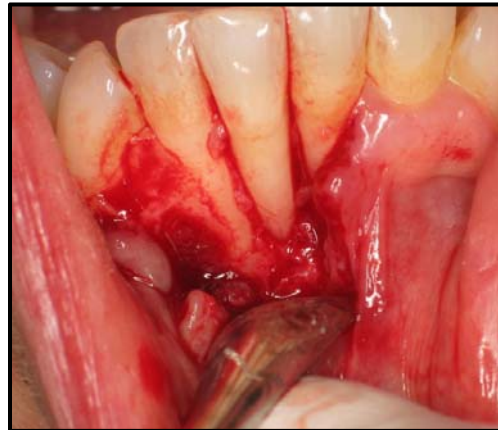


CASE 2, FIG. 5: 9 days post-op, epithelial tissue development over DynaMatrix.

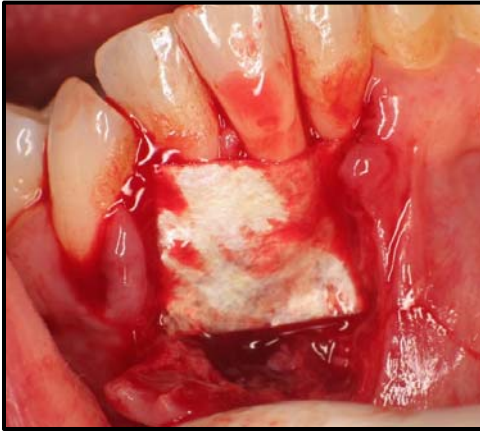
Case 3: Root Coverage and Development of Keratinized Tissue. Patient presented with localized recession on teeth #24 and #25 and inconsistent tissue heights due to severe bone loss. A vertical flap was created to expose the roots, and DynaMatrix[®] was placed and hydrated with blood. Adjacent tissue was laterally positioned and DynaMatrix[®] was sutured into place. A large area of DynaMatrix[®] was left exposed. Seven days post operative patient showed successful healing and epithelialization of DynaMatrix[®].



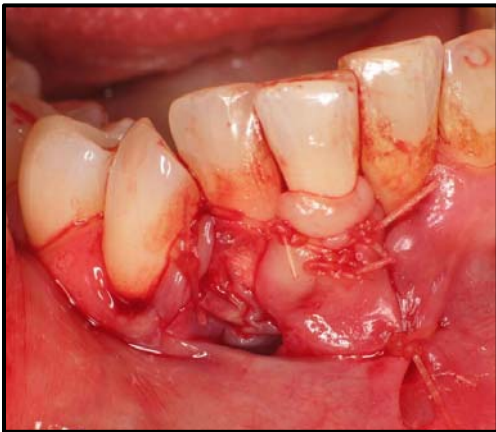
CASE 3, FIG. 1: Teeth #24 and #25 have localized recession and inconsistent tissue heights due to severe bone loss.



CASE 3, FIG. 2: Vertical flap created to expose roots.



CASE 3, FIG. 3: DynaMatrix[®] placed and hydrated with blood.



CASE 3, FIG. 4: Adjacent tissue was laterally positioned and DynaMatrix[®] sutured into place.



CASE 3, FIG. 5: 7 days post-op, successful healing and epithelialization of DynaMatrix[®].

Case 4: Deepen Vestibule and Develop Keratinized Tissue. Patient presented with a shallow anterior vestibule with poor volume of keratinized tissue.

An incision was made at the mucogingival junction and DynaMatrix[®] was placed and hydrated with blood. Ten day post op images demonstrate the vestibule was expanded and the development of healthy, keratinized tissue had begun.



CASE 4, FIG. 1: Anterior vestibule is shallow and has poor keratinized tissue.



CASE 4, FIG. 2: Incision was made at the mucogingival junction.



CASE 4, FIG. 3: DynaMatrix[®] was placed and hydrated with blood.

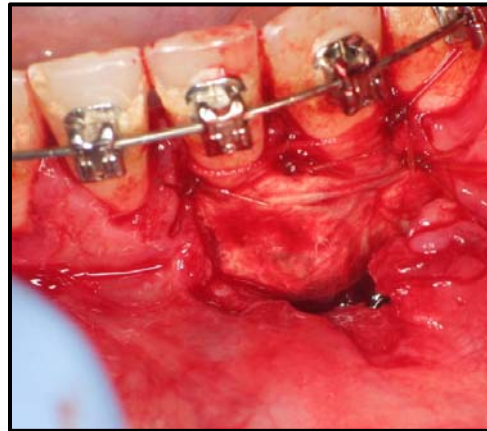


CASE 4, FIG. 4: 10 days post-op, expanded vestibule and healthy, keratinized tissue developing.



CASE 5, FIG. 2: Vertical flap was created to expose root. Notice severe bone loss.

Case 5: Localized Recession and Bone Loss Due to Orthodontic Treatment. Patient presented with severe recession in teeth #24 and #25 due to bone loss from orthodontic treatment. A vertical flap was created to expose the root and DynaMatrix[®] was placed, hydrated with blood and sutured into place. 24 weeks post op demonstrated tissue development over exposed root and 26 weeks post op demonstrated developed keratinized tissue.



CASE 5, FIG.3: DynaMatrix[®] placed, hydrated with blood and sutured into place with adjacent tissue.



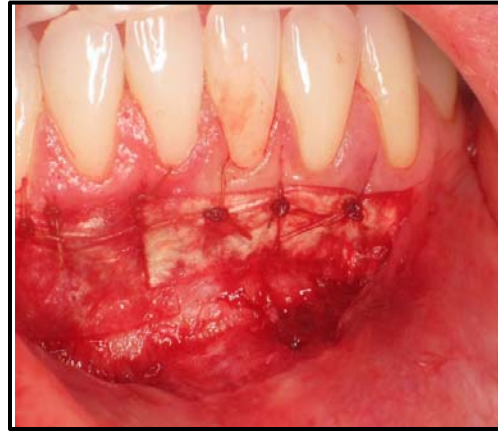
CASE 5, FIG. 1: Teeth #24 and #25 have severe recession due to bone loss from orthodontic treatment.



CASE 5, FIG. 4: 24 weeks post op with tissue development over exposed root.



CASE 5, FIG. 5: 26 weeks post op with developed keratinized tissue.



CASE 6, FIG. 2: Incision made at mucogingival junction, DynaMatrix[®] placed, hydrated with blood and sutured to adjacent tissue.

Case 6: Insufficient Zone of Attached Gingiva. Patient presented with insufficient zone of attached gingival tissue. Referring orthodontist recommended deepening vestibule for treatment. An incision was made at mucogingival junction and DynaMatrix[®] was placed, hydrated with blood and sutured into place with adjacent tissue. Six week post op demonstrated healthy tissue development.



CASE 6, FIG 3: 6 week post op with healthy tissue development.



CASE 6, FIG. 1: Insufficient zone of attached gingiva.

Case 7: Thicken Gingiva and Develop Keratinized Tissue. Patient presented with thin zone of attached gingival tissue. Referring doctor recommended developing keratinized tissue for treatment. An incision was made at mucogingival junction and DynaMatrix[®] was placed, hydrated with blood and sutured into place with adjacent tissue. DynaMatrix[®] was then left exposed. Six week post op demonstrated healthy tissue development with thicker tissue and keratinized tissue development.



CASE 7, FIG.1: Thin zone of attached gingival tissue.



CASE 7, FIG 2: Incision was made at mucogingival junction. DynaMatrix was placed, hydrated with blood, sutured into place with adjacent tissue and left exposed.



CASE 7, FIG 3: 6 week post op with thicker tissue and healthy keratinized tissue development.

Conclusion

This case series demonstrates the efficacy of DynaMatrix® Extracellular Membrane for the treatment of exposed roots and the development of attached keratinized tissue. Post operative evaluation revealed successful tissue remodeling in the treated areas and a substantial increase in keratinized tissue volume.

In addition to successful clinical outcomes, DynaMatrix® offers a number of advantages over traditional sources for soft tissue grafting. One such advantage of DynaMatrix® in tissue augmentation is the avoidance of a secondary donor site, as required in autogenous connective or free gingival graft methods. For patients, eliminating a donor site reduces the likelihood of pain, bleeding and infection. For clinicians, it may reduce treatment time. Further, DynaMatrix® does not require enclosure in the patient's existing tissue. The material may be left exposed in the surgical site, where it blends with native tissue and produces a superior aesthetic result.⁸

This case series supports the use of DynaMatrix® as an alternative to autogenous soft tissue grafting in order to achieve root coverage or augment the amount of keratinized tissue present.

¹ Edel A. Clinical evaluation of free connective tissue grafts used to increase the width of keratinized gingival. (J Clin Periodontol 1974; 1:185-196)

² Yukna RA, Tow HD, Carroll PB, Vernino AR, Bright RW. Comparative clinical evaluation of freeze-dried skin allografts and autogenous gingival grafts in humans. (J Clin Periodontol 1977;4:191-199).

³ Yukna RA, Tow HD, Carroll PB, Vernino AR, Bright RW. Evaluation of the use of freeze-dried skin allografts in the treatment of human mucogingival problems. (J Periodontol 1977;48:187-193).

⁴ Gher ME Jr, Williams JE Jr, Vernino AR, Strong DM, Pelleu GB Jr. Evaluation of the immunogenicity of freeze-dried skin allografts in humans. (J. Periodontol 1980;51:571-577).

⁵ Silverstein LH, Callan DP. An acellular dermal matrix allograft substitute for palatal donor tissue. Postgraduate Dent 1997; 3:14-21.

⁶ Harris RJ. Gingival augmentation with an acellular dermal matrix: Human histologic evaluation of a case – Placement of the graft on bone. Int J Periodontics Restorative Dent 2001; 21:69-75.

⁷ Nevins M., Nevins ML., Camelo M., Camel JMB., Schupbach P., Kim D., The Clinical Efficacy of DynaMatrix Extracellular Membrane in Augmenting Keratinized Tissue (Int. J. Periodontics Restorative Dent 2010;30:151-161)

⁸ Nevins, et al. (Int. J. Periodontics Restorative Dent 2010;30:158-159)

* These case reports have not been previously published. [This paper was created for marketing purposes.](#)