



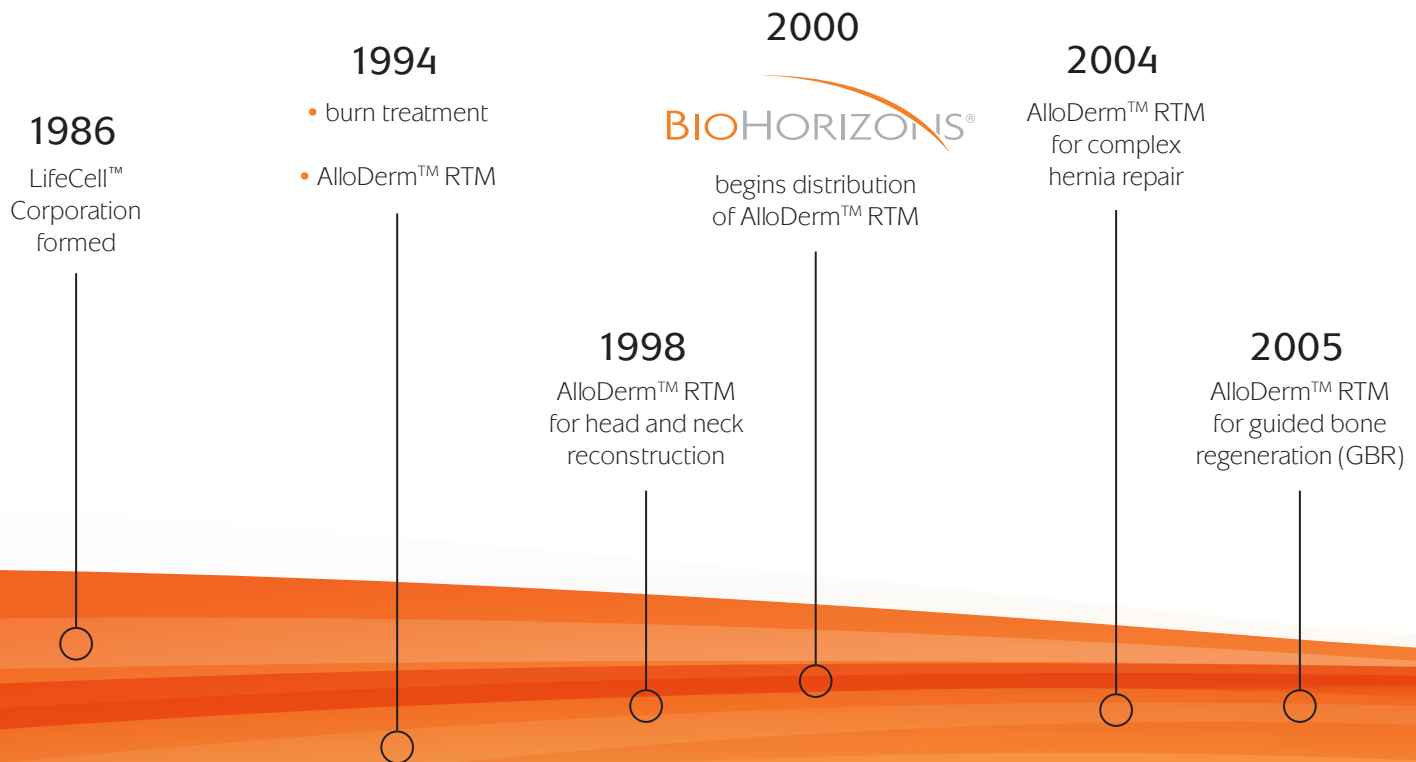
NovoMatrix™

Reconstructive Tissue Matrix

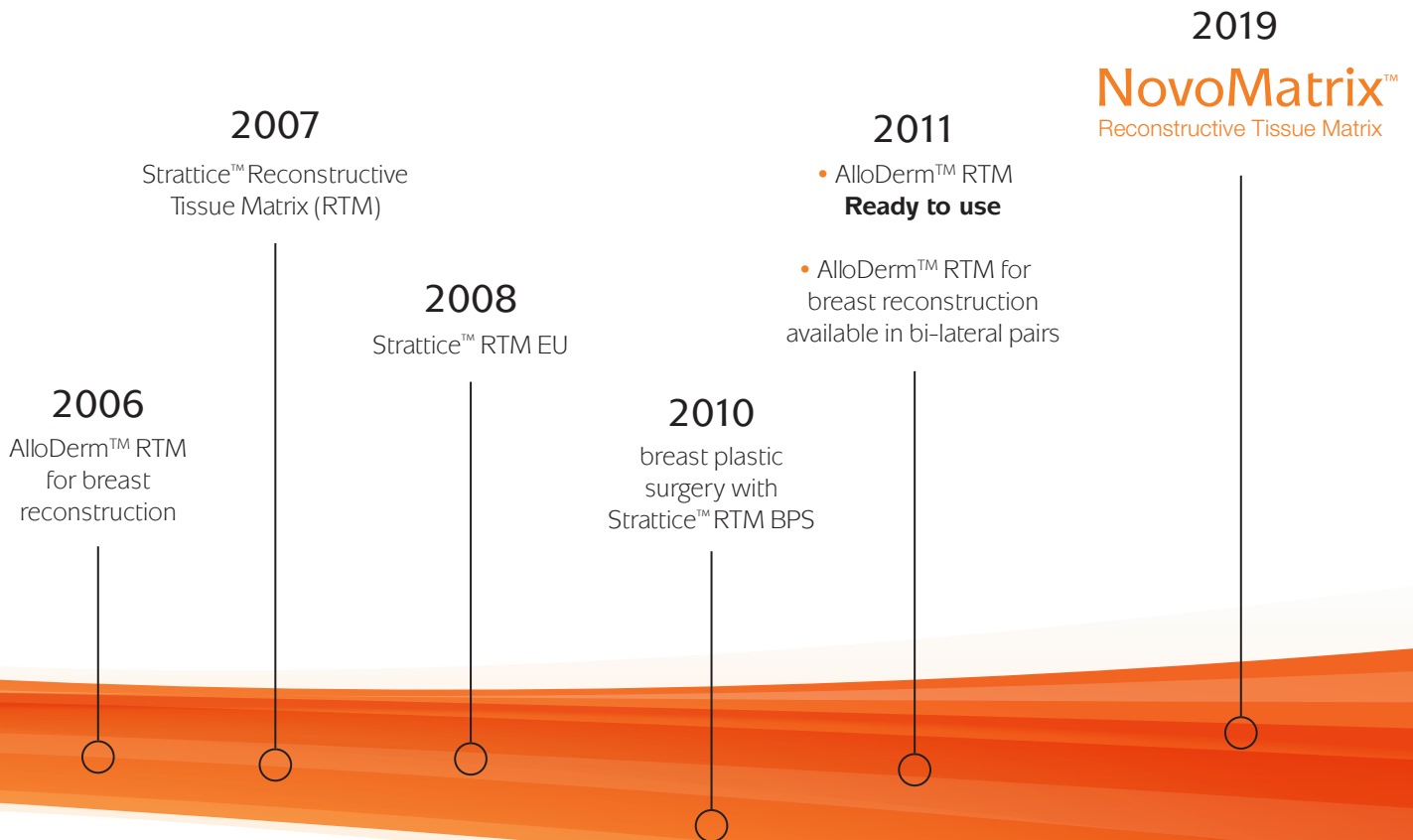
BIOHORIZONS
SCIENCE • INNOVATION • SERVICE

about LifeCell,TM an Allergan affiliate

advancing surgery and improving patients' lives



For over two decades, LifeCell™ has developed innovative products for use in a wide range of applications.



NovoMatrix™ Reconstructive Tissue Matrix

the next generation soft tissue augmentation material

NovoMatrix™ is an acellular dermal matrix intended for soft tissue applications where cellular repopulation and revascularization allow for optimal regeneration.

- LifeCell tissue process generates fast revascularization
- consistent thickness
- pre-hydrated, ready-to-use
- can be stored at room temperature

applications include¹

- guided tissue regeneration for root coverage
- localized gingival augmentation to increase keratinized tissue around teeth
- alveolar ridge reconstruction for prosthetic treatment



ordering information

NOVO-1.5x1.5	NovoMatrix™ Reconstructive Tissue Matrix, 1.5x1.5
NOVO-1.5x2.5	NovoMatrix™ Reconstructive Tissue Matrix, 1.5x2.5
NOVO-1.5x4.5	NovoMatrix™ Reconstructive Tissue Matrix, 1.5x4.5
NOVO-2.5x4.5	NovoMatrix™ Reconstructive Tissue Matrix, 2.5x4.5



“NovoMatrix™ graft has uniform physical characteristics and great surgical handling, enhancing its ease of use in the tunneling technique. This results in an excellent clinical outcome with minimal post-operative swelling and inflammation.”

Edward P. Allen, DDS, PhD

NovoMatrix™ case 1



1) Pre-op



2) 1 week post-op



3) 8 month post-op

NovoMatrix™ case 2



1) Pre-op



2) 2 week post-op



3) 6 month post-op

NovoMatrix™ case images courtesy of Dr. Edward P. Allen

the proof is in the process

a breakthrough in xenogenic processing

NovoMatrix™ is an acellular dermal matrix derived from porcine tissue intended for soft tissue applications. The LifeCell tissue process is designed to retain the biomechanical integrity of the tissue, which is critical for optimal regeneration.

1 tissue selection

Designed and manufactured from targeted porcine tissue for **desired mechanical and handling properties**.

2 dermis isolation

Non-chemical based method with precision instrumentation that removes all non-dermal tissue **retaining the structural integrity of the matrix**.

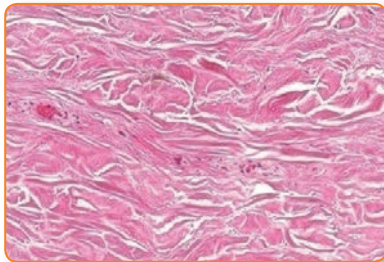
3 microbial neutralization

Proprietary process removes 99.99% of pathogens leading to a **less damaging sterilization process**.*

4 decellularization & enzyme treatment

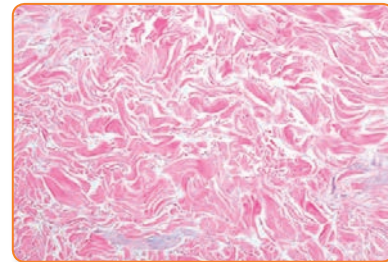
Maintains natural collagen structure while extracting porcine alpha-gal antigen as well as cellular and DNA components to **minimize the xenogenic immune response**.

porcine tissue engineered to



Human Dermis

controlled
processing



AlloDerm™ RTM

5 matrix preservation

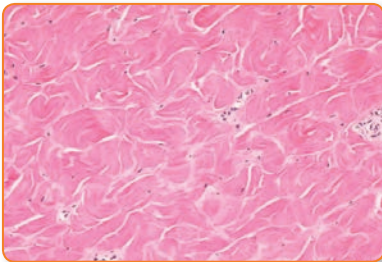
Proprietary formula that stabilizes key matrix proteins and further protects the integrity of the acellular dermal matrix which enables a **platform for tissue regeneration**.

6 sterilization

Optimized sterilization process designed to minimize free radical damage **preserving the regenerative properties of the acellular dermal matrix**.

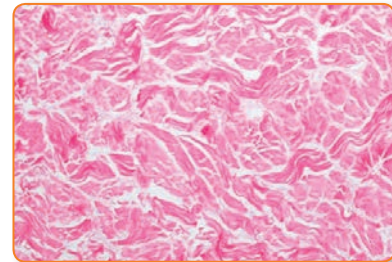
7 regeneration

perform at a human level



Porcine Dermis

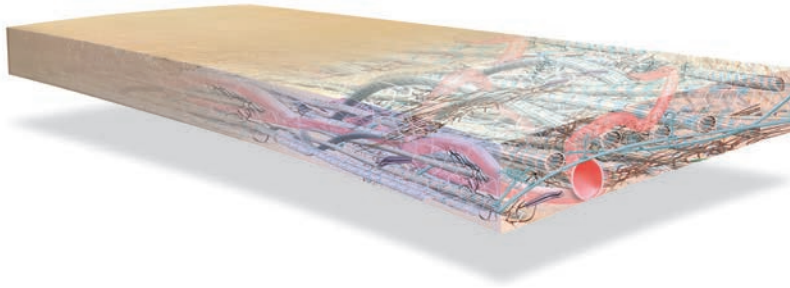
controlled
processing



NovoMatrix™

mechanism of action

the processing of a biological material ultimately impacts the clinical outcome



Regenerative Tissue Matrix

Complex acellular heterogenous scaffold and blood vessel architecture; pre-hydrated and ready-to-use

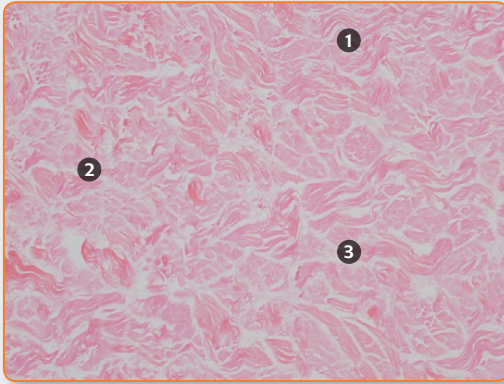
LifeCell processing method

processing	body's response	mechanism of action	clinical outcome
LifeCell non-damaging proprietary process	Accept / Integrate via regenerative process	Regeneration scaffold facilitates tissue regeneration capability which transitions to functional host tissue	<ul style="list-style-type: none">• supports rapid revascularization and repopulation by host tissue• minimal inflammatory or foreign body response*

alternative processing methods

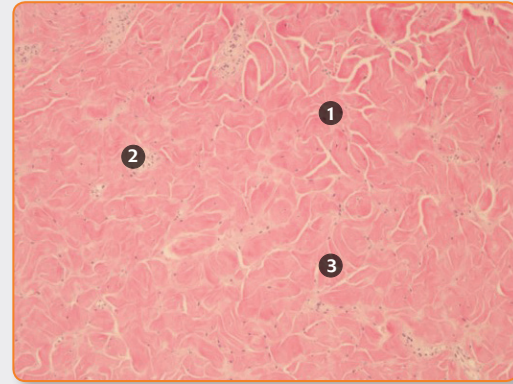
processing	body's response	mechanism of action	clinical outcome
damaging or denaturing processing of a biological material	Attack / Breakdown via inflammatory response	Fibrotic Scar inflammatory cell repopulation; resorption of damaged scaffold; replaced with fibrotic scar	<ul style="list-style-type: none">• similar to resorbable synthetic• sub-optimal long-term strength associated with scar tissue• may be contractile <p>References: 2-11</p>
intentionally cross-linking a biological material	Attack / Isolate / Extrude via foreign body response	Encapsulation scaffold is resistant to enzymatic digestion; blocks normal mechanisms of cell ingrowth and vascular ingrowth	<ul style="list-style-type: none">• similar to permanent synthetic• may be less resistant to infection due to inability to support revascularization• does not integrate <p>References: 3, 4, 12-30</p>

out of package histology



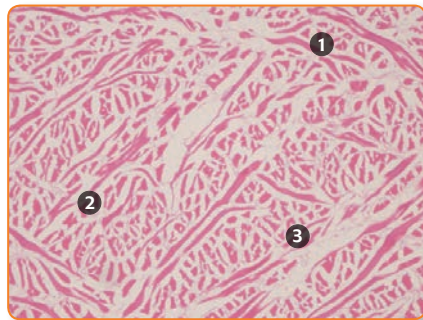
NovoMatrix™

- 1) Natural spacing between dermal collagen fibers
- 2) Acellular porcine collagen matrix
- 3) Native fibrillar collagen structure



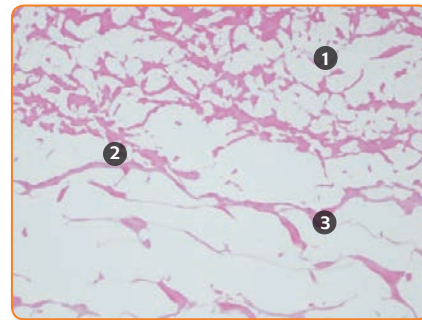
Native Porcine Dermis

- 1) Natural spacing between dermal collagen fibers
- 2) Cell presence within collagen fibers
- 3) Native fibrillar collagen structure



Mucoderm®

- 1) Altered spacing between dermal collagen fibers
- 2) Acellular porcine collagen matrix
- 3) Modified condensed collagen structure



Mucograft®

- 1) Significant spacing between collagen fibers in non-native sponge structure
- 2) Acellular porcine collagen matrix
- 3) Modified condensed collagen structure

surgical technique

Tunnel Technique

as described by Edward P. Allen, DDS, PhD

Treating multiple tooth recession defects traditionally requires a significant palatal tissue harvest to adequately supply enough donor material to successfully treat the defect. This often can lead to undesired surgical and post-surgical sequelae for both the surgeon and the patient. NovoMatrix™ can be used as an effective alternative to palatal tissue in a wide variety of intraoral applications.³¹ The following is an example of a suggested surgical technique for treating recession defects around teeth. This technique can be modified to be applicable to similar clinical presentations.

This content is only intended as a reference. Proper surgical procedures and techniques are the sole responsibility of the dental professional. Each surgeon must evaluate the appropriateness of the techniques based on his or her own dental training and expertise.

For more details about this technique, please refer to:
Subpapillary continuous sling suturing method for soft tissue grafting with the tunneling technique.
Allen EP. *Int J Periodontics Restorative Dent*. 2010 Oct;30(5):479-85.

Dr. Allen is a consultant for BioHorizons.

1) pre-op

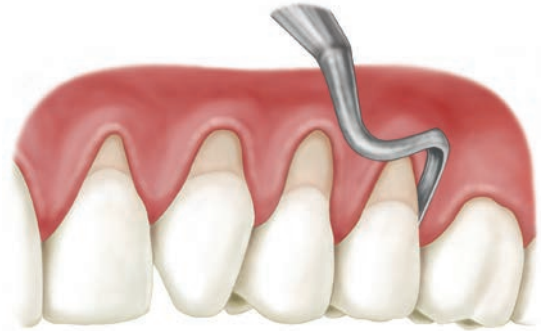
This technique will demonstrate the Tunnel Technique for root coverage grafting with NovoMatrix™.

Gingival recession involving 4 maxillary teeth, the left lateral incisor through the left second premolar. There is no loss of interdental bone or soft tissue fill. Typical Miller Class I or II recession defects are noted.



2) intrasulcular incisions

Using an End-Cutting Intrasulcular Knife or similar microsurgical instrument, make intrasulcular incisions facially and proximally around each tooth with recession defects, as well as one additional tooth anterior and posterior to the teeth with recession.



3) blunt dissection

A microsurgical elevator is used to elevate a mucoperiosteal pouch 4-5mm apical to the mucogingival junction at each tooth with recession as well as an additional tooth mesially and distally to facilitate tissue mobilization. Extend the blunt dissection under the papillae facially.



4) sharp dissection

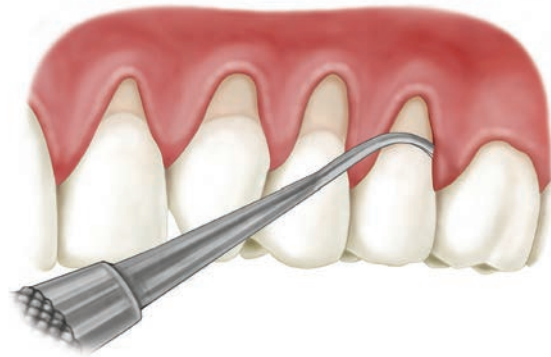
Using a Modified Orban Knife, sharp dissect immediately supraperiosteally to mobilize and extend the tunnel 12-15mm apical to the gingival margin at each tooth with recession as well as an additional tooth mesially and distally.
Stay in contact with bone to ensure a patent tunnel.



surgical technique

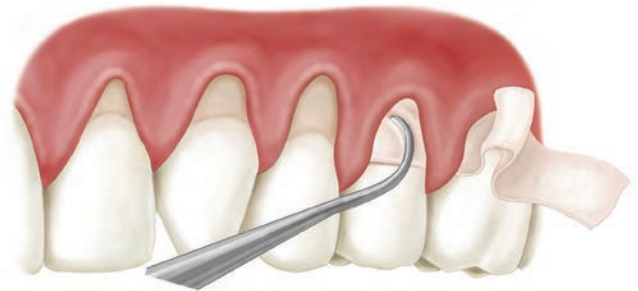
5) elevate papillae interdentally

Detach the papillae from the interdental bone crest using a Younger-Good curette or similar instrument. Extend this blunt (subperiosteal) elevation to the palatal line angles.



6) NovoMatrix™ insertion

Trim the graft to extend from the distal of the central incisor to the mesial of the molar, with a vertical dimension of 8mm. The graft is inserted into the sulcus of a terminal tooth with recession and passed through the tunnel using a Younger-Good curette or similar instrument.



7) NovoMatrix™ alignment

The graft should be positioned to extend from the distal of the central incisor to the mesial of the molar so that it lies completely under the papillae mesial and distal to the teeth with recession.



8) preparation for suturing

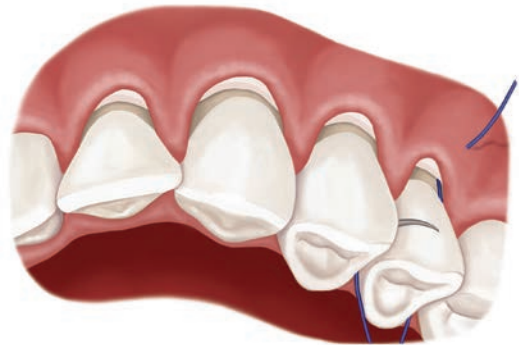
Displace the graft within the tunnel so that the coronal border of the graft is level with the tissue margin in preparation for simultaneous coronal advancement of the graft with the overlying tissue.



NOTE: A continuous sling suture or interrupted sling sutures may be used.

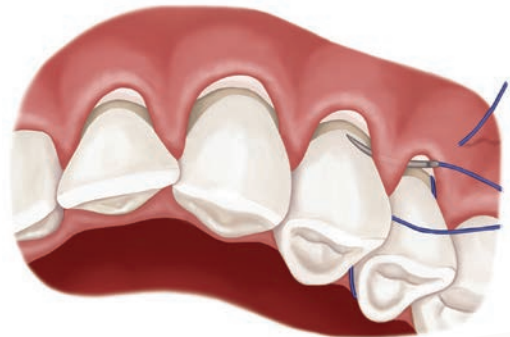
9a) continuous sling suture

Penetrate the overlying tissue and graft at the distal root line angle of the second premolar, 4mm apical to the tissue margin. Exit through the sulcus and pass the needle through the distal embrasure, around the palatal aspect and back to the facial through the mesial embrasure.



9b) continuous sling suture

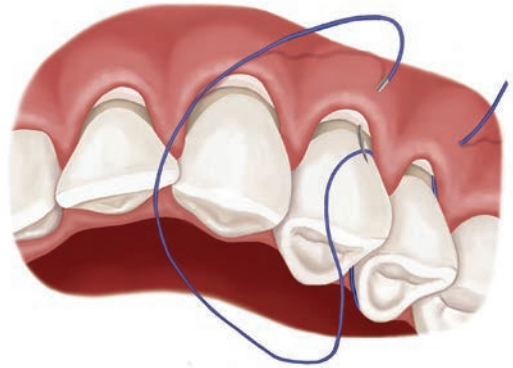
Pass under the papilla from the second premolar toward the first premolar.



surgical technique

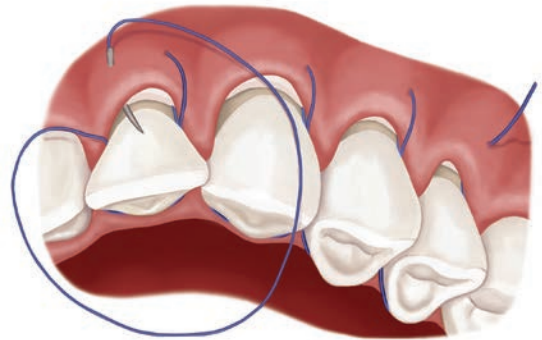
9c) continuous sling suture

Penetrate the overlying tissue and graft at the distal root line angle of the first premolar and repeat the previous steps until reaching the lateral incisor.



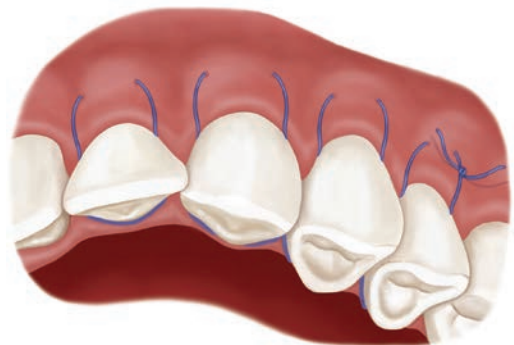
9d) continuous sling suture

After passing around the palatal of the lateral incisor and returning to the facial through the mesial embrasure, penetrate the overlying tissue and graft at the mesial root line angle.



9e) continuous sling suture

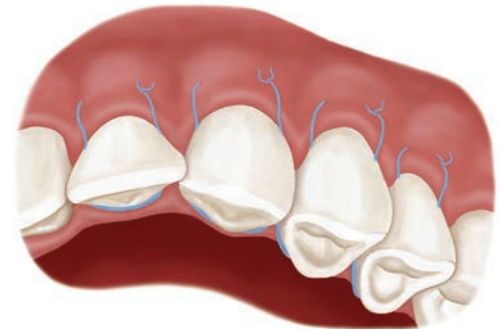
Work back to the starting point, always passing under the papillae. The suture will be tied only at the distal of the second premolar.



surgical technique

10) interrupted sling sutures

Penetrate the overlying tissue and graft at the distal root line angle of the second premolar, 4mm apical to the tissue margin. Exit through the sulcus and pass the needle through the distal embrasure, around the palatal aspect and back to the facial through the mesial embrasure. Penetrate the overlying tissue and graft at the mesial root line angle of the second premolar 4mm apical to the tissue margin, pass through the mesial embrasure around the palatal aspect of the second premolar and return to the facial through the distal embrasure. Tie the suture and repeat the process for each tooth.



11) post-op - suture removal

Sutures are removed at 2 months. Complete root coverage in Miller Class I and II recession with an increase in marginal tissue thickness and stability should be achieved.



Hu-Friedy® Sutures

- 300 Series Stainless Steel, the ideal alloy for dental suture needles, ensures a strong sharp needle pass after pass
- Manufactured from a stronger alloy composition, increasing ductile strength - if the needle does bend, it is less likely to break when reshaping
- Finer point geometry for smooth tissue penetration, requiring up to 20% less force* than other suture needles
- Laser-drilled needles for reduced tissue disruption

Dr. Edward P. Allen's Recommended Suture



HF-PSN8384P

For use in oral plastic surgery procedures

Perma Sharp® Suture

6-0 Polypropylene 18", C-17.

Finer point geometry for smoother penetration.

Allen Oral Plastic Surgery Kit

HF-ALLENKIT Allen Oral Plastic Surgery Kit

Developed by Dr. Edward P. Allen, this comprehensive kit provides precision microsurgical instruments specifically designed for invasive soft tissue grafting procedures.



HF-SYRCW Cook-Waite Anesthetic Aspirating Syringe, 1.8ml



HF-S5080 Goldman-Fox Perma Sharp® Scissors, Straight



HF-NHM-5026R Micro Castroviejo, Straight, Diamond Dusted



HF-PCP116 Color-Coded Probe 3-6-8-11



HF-10-130-05 #5 Scalpel Handle, Round, Straight



HF-SYG7/89 Younger-Good 7/8 EverEdge® (2 per kit)



HF-PPAELPX Allen Periosteal Elevator, Posterior, Black Line



HF-SP20 Corn Suture Pliers



HF-PPAELAX Allen Periosteal Elevator, Anterior, Black Line



HF-PPAELX Allen Periosteal Elevator, Black Line



HF-KPAX Allen End-Cutting Intrасulcular Knife, Black Line



HF-AlLENCARD Allen Membrane Measurement Card



HF-KO12KPO3R9 Allen Modified Orban Knife 1/2, Round, EverEdge®



HF-MIR5/3 #5 Front Surface Mouth Mirror, 3 pack

HF-MH6 #6 Satin Steel® Mirror Handle (2 per kit)



HF-IMN4160 16 Instrument Infinity Series Cassette



HF-8-905DD Precision Dressing Forceps, Diamond Dusted



HF-KO12KP3R49 Allen Arrowhead Knife

HF-MCUPE Immunity Steel Cup, Modified

additional items available individually

HF-KO12KPO3AR Allen Modified Orban Knife 1/2, Round, #6 Satin Steel® Handle

HF-KO12KPO3A6 Allen Modified Orban Knife 1/2, #6 Satin Steel® Handle

HF-KO12KPO3A9 Allen Modified Orban Knife 1/2, EverEdge®



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