Recession Coverage and Gain in Keratinized Zone using Tunneling Techniques

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Background

The etiology of Gingival Recession (GR) is multi-factorial. When it occurs, it is associated with esthetics, impaired brushing, or progressive nature of the disease in the presence of inadequate zone keratinized tissue (KT).

The amount of adequate volume of KT has remained controversial in periodontal literatures. However, American Academy of Periodontology (AAP) consensus report escalated the importance of treatment of GR because it is involved with alveolar bone dehiscence which worsen tooth expectancy. This should be addressed and highlighted to the patients. As Dr. Garber speculated "Bone sets the tone but tissue is the issue." We never forget soft tissue phenotypes are the reflection of the underlying bone and its condition"

In terms of treatment of GR, the EFP (European Federation of Periodontology) and AAP studied and yielded that Coronally Advanced Flap (CAF) in combination of Connective Tissue Graft (CTG) presented the best outcomes in numerous RCT studies.

Tunneling techniques was first introduced by Dr. Ion Zabalegui, from Portugal, trained at USC Perio later. His primary concern about CAF is to eliminate the vertical incisions which reduce morbidity, provide atraumatic surgery and render a faster healing.

Tunneling techniques are a type of the coronally Advanced Flap

Rationale for GR treatment

· Sensitivity
· Esthetics
→ Patient perspectives

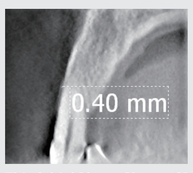
· Inflammation
· Root caries
· Bone loss
→ Dentist perspectives

* Gingival recession must be treated DUE to
Alveolar bone loss, inflammation, and root caries.
Cosmetics should NOT be the Primary etiology.

Relationship bet Gingival Recession and Alveolar Bone Dehiscence

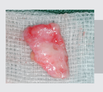
· Difference between recession depth and dehiscence depth was 2.76 mm (Biologic width is about 3 mm, Gargiulo. JP 1961)
· 1.0 mm increase in recession results in increase of 0.98 mm in the alveolar bone dehiscence (Lost, JCP 1984)

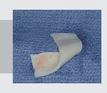
Bony Dehiscence.



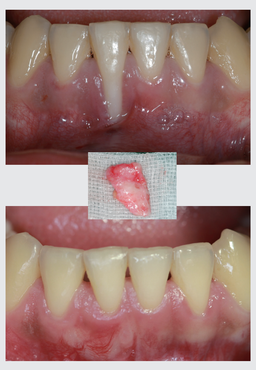
Thin labial Plate of bone, CBCT

CTG Vs. ADM





Connective tissue graft	Acellular dermal matrix
1. best result (gold standard)	1. good result
2. increased morbidity	2. decreased morbidity
3. no immune reaction	3. possible immune reaction
4. limited amount	4. unlimited amount
5. inconsistent quality	5. consistent quality
6. no cost for material	6. costly material
7. prolonged surgical time	7. reduced surgical time
8. small exposure does not alter the outcomes	8. complete primary closure must be achieved



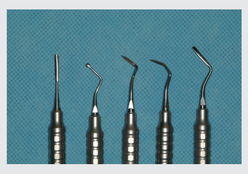
We now know CAF + CTG work well.

Because traditionally it requires Vertical incisions, Periodontists focus on less invasive surgical techniques

Tunneling Techniques

(Less invasive version of Coronally Advanced Flap)

1. No verticals incision
2. No papillary incision
3. Undermining flaps



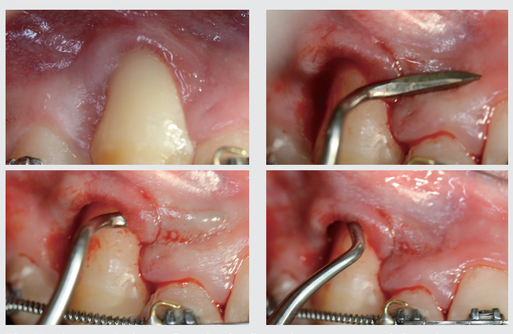
* Avoid vertical incisions and incisions around the tip of papilla, instead undermining the flap.
* Flap undermined should pass the MGJ (MucogGingivalJunction)

Envelope Vs Tunnel Vs Pouch

Tunnel
= multiple envelop to treat multiple teeth (Zabalegui 1999)

Envelop
= single tooth tunnel
= pouch technique (Raetzke 1985)

Flap Elevation using various Orban knifes in TUNNELING

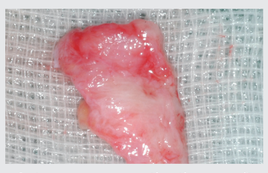


The Key is to make loose flap. So the flap advances coronal direction.

CASE #1

1. Gingival recession #22,23,24
2. #23 defect involved enamel (it means a surgery + restorations)

Defect extending into enamel



Autogenous connective tissue graft

Tunnelingtechniques. No Vertical incision
Tunneling as coronally advanced

Key for Successful Tunneling Techniques

1. No vertical incisions
2. Undermining incision crossing MGJ
3. Flaps should be as passive as possible

Baseline defect

Final outcome 5 year PO

Final outcomes 9 year PO

CASE #2

- GR #21 - #25, multiple recession
- Removal of existing resin fillings
- Tx Plan: ADM + Tunneling + EMD
  ADM (Acellular dermal matrix)
  EMD (Enamel matrix derivatives)

- Grafts must be immobilized.(Key for Success)
- Prefjel applied to tooth surface. It is called Biomodification promoting regeneration.
- Flaps are tunneled - no vertical incision

1. GR #21, 22, 23. 24, 25.
2. Intact papilla
3. Existing KT

Recessions on #21, 22, 23, 24, 25

ADM (Acellular Dermal Matrix)
: used as tissue substitutes

EMD (Enamel Matrix Derivatives)
: promotes cementogenesis

3 year PO

5.5 year PO
ADM can be retained if SPT rendered regularly.

CASE #3

- Full Mouth Tunneling
- 3 to 5 mm recession
- sensitive upon brushing
- ADM as grafts

- Swann Morton blades used
- no vertical incisions
- no incision near papilla tips
- sufficient undermining

Tunneling w/ADM

2 yr PO

Incisions in Tunneling

Photo shows that flaps advance coronally w/o having vertical incisions, or incision near the tip of papilla solely flaps undemined

Baseline

Flap undermined

Flap advanced coronally

CASE #4

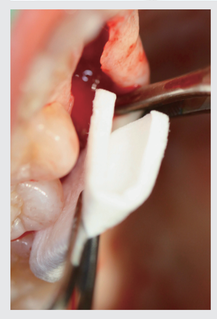
- post ortho Tx
- 6 lower ant teeth
- lack of KT

- GR #31 and 41
- RC and gain in KT
- Tx Plan: Tunneling + ADM

-Tunneled
- ADM placed
- No vertical incisions

Recession coverage & gain in KT improved

Harvesting Connective Tissue Grafts



CASE #5

1. GR #43, Severe
2. Existing diastema
3. Minimum KT present
4. Tx Plan: Tunneling + ADM

- Recession coverage (RC)
- CAF + CTG: best outcome

ADM placed, No vertical incisions

Tunneled flap coronally advanced

Final outcome, 5 years PO

CASE #6

1. Gingival recession #13
2. Pre-Orthodontic RC
3. Tx Plan: CTG + Tunneling
4. Regular SPT for lifetime