

UCLA Hawaii 2019

"Periodontal Plastic Surgical Procedures to Enhance Esthetics"

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THANK YOU FOR THE INVITATION!

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Dr. Flavia Pirih

"Periodontal Plastic Surgical Procedures to Enhance Esthetics"



Periodontal Esthetics: a conversation



What is
Attractive?

&

Who decides?



Mayans 800 BC

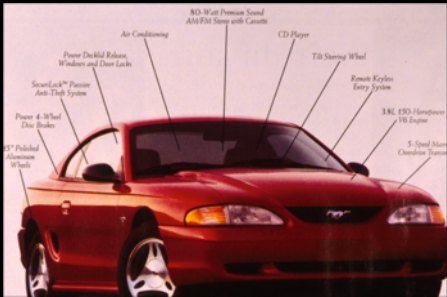


Etruscans 9th Cent AD



USA 2019

Societies choose their own standards of beauty...



PERIODONTAL ESTHETICS?

PUB MED

Dental Esthetics

16,054

Periodontal Esthetics

1,473

10.9 to 1

ESTHETICS IN DENTISTRY

- Essentials of a smile
 - Teeth
 - Lip framework



ESTHETICS IN DENTISTRY

- Essentials of a smile
 - Teeth
 - Lip framework
 - **Gingival scaffold**



Ideal Smile

Small Variation

- Interest
- Naturalness
- Energy



Ideal Smile

Large Variation

- Disrupts harmony
- Disunity
- Distraction



Large Variation

Ideal Smile

**Dental
Cognitive
Dissonance**



Large Variation

Ideal Smile

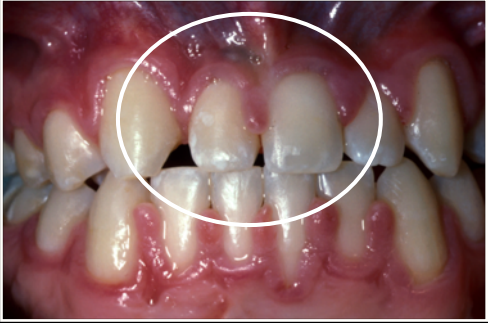
Cognitive dissonance is an uncomfortable feeling caused by holding two contradictory ideas simultaneously.



Large Variation

Visual Tension

Ideal Smile *Something is not right*



The image shows a close-up of a person's upper teeth. A white circle is drawn around the space between the two central incisors, highlighting a noticeable gap. The surrounding text and labels suggest this is an example of visual tension or a deviation from an ideal smile.





Periodontal Esthetics



Comparing the Perception of Dentists and Lay People to Altered Dental Esthetics

Kokich, et al, J Esthet Dent '99

Rated according to attractiveness of minor variations

Gingival Margin Heights **Bilateral**



0 mm



0.5mm



1.0mm



1.5mm



2.0mm

Dental Esthetics

Comparing the Perception of Dentists and Lay People to Altered Dental Esthetics

Kokich, et al, J Esthet Dent '99/06

- Crown length
- Crown width
- Incisor crown angulation
- Midline
- Open gingival embrasure
- Gingival margin
- Incisal plane
- Gingiva-to-lip distance

Periodontal Esthetics: what did we learn?



Bilateral Variations

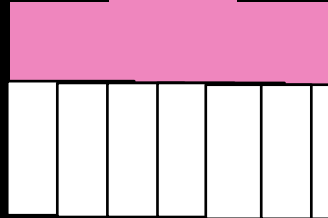
Parameter	Orthodontists	Generalists	Lay people
Crown length (mm)	1.0	1.5	2.0
Crown width (mm)	3.0	3.0	4.0
Incisor angulation (mm)	2.0	2.0	2.0
Midline (mm)	4.0	ND	ND
Open ging embras (mm)	2.0	3.0	3.0
Gingival margin (mm)	ND	ND	ND
Incisal plane (mm)	1.0	1.0	3.0
Gingiva to lip (mm)	2.0	4.0	4.0
ND = non-detectable			

Periodontal Esthetics

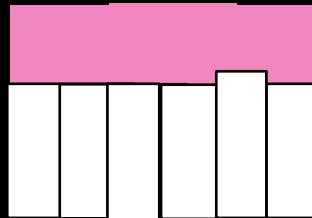
Comparing the Perception of Dentists and Lay People to Altered Dental Esthetics

Kokich, et al, J Esthet Dent '99,'06


- **Crown length**
- Crown width
- Incisor crown angulation
- Midline
- **Open gingival embrasure**
- **Gingival margin**
- Incisal plane
- **Gingiva-to-lip distance**



Patients see White and Pink



Small variations are tolerated



But there is a threshold...beyond the viewer's expectation of normal



...including signs of gingival health

This departure from the normal creates a...

***Visual
Tension!***



Periodontal Esthetics

Expectation

- Health: inflammation free
- Coral pink
- Surface texture: stippled
- Balanced, symmetrical
- Scalloped gingival line
- Gingival zenith, distal
- Gingival contour, convex
- Papilla: fill the embrasures



Periodontal Esthetics



≠



Treatment Goal

Emulating this...to the best of our abilities



Creating
the Ideal...

GINGIVAL SCAFFOLD



BASICS of PERIODONTAL ESTHETICS

- Health
- Color
- Gingival positions
- Gingival orientation
- Papilla: fill embrasures
- Ridge contour normal
- Roots covered

PERIODONTAL ESTHETICS

HEALTH OF THE GINGIVAL SCAFFOLD

- Color
- Size
- Shape

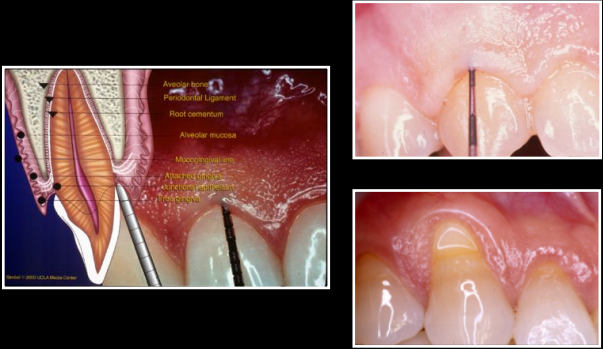


PERIODONTAL ESTHETICS

GINGIVAL SCAFFOLD

Individual teeth

- **Position of gingival margin**
 - 1 to 3 mm coronal to CEJ on a fully erupted tooth

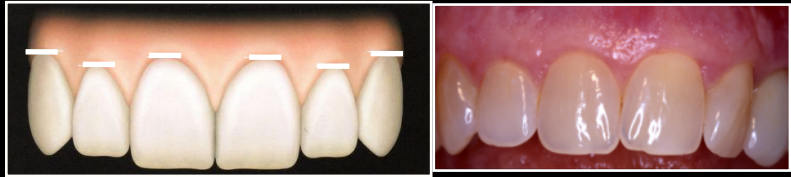


PERIODONTAL ESTHETICS

GINGIVAL SCAFFOLD

Anterior Teeth

- **Gingival margin position**
 - Ideal: similar height on central incisors and canines, coronal on lateral incisors



Fradeani '04

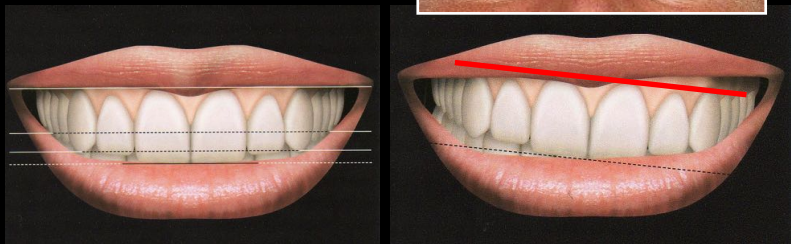
PERIODONTAL ESTHETICS

GINGIVAL SCAFFOLD

Anterior Teeth

Gingival margin orientation

Parallel to commissures,
inter-pupillary line

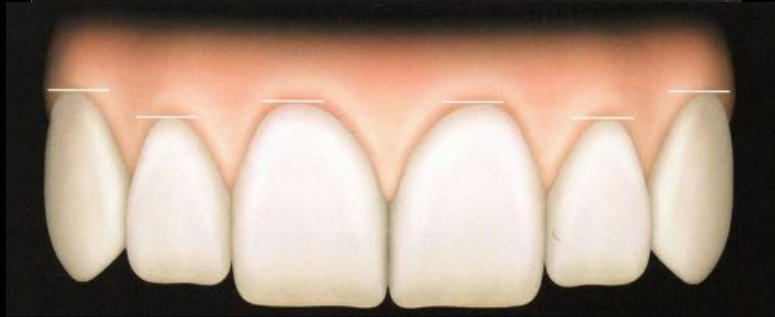


Fradeani '04

PERIODONTAL ESTHETICS

GINGIVAL SCAFFOLD

Interdental Papillae That Fill the Embrasures



Fradeani '04

PERIODONTAL ESTHETICS

GINGIVAL SCAFFOLD

Bilaterally Symmetrical



Fradeani '04

PERIODONTAL ESTHETICS

GINGIVAL SCAFFOLD

Bilaterally Symmetrical



PERIODONTAL ESTHETICS

GINGIVAL SCAFFOLD HEIGHT

- Natural tooth proportions

L/W 75-80%
Chiche & Pinault, '94



PERIODONTAL ESTHETICS

GINGIVAL SCAFFOLD

- Natural root convexities



PERIODONTAL ESTHETICS

GINGIVAL SCAFFOLD

Lip line/ Gingival Display

1-3 mm 2x in females



75%
75-100%
1-3 mm 2x in females

LOW 20.5% MEDIUM 69% HIGH 10.5%

Fradeani '04

PERIODONTAL ESTHETICS

GINGIVAL SCAFFOLD

- Gingival tissue/tooth display
- 1-3 mm of soft tissue display
(Garber & Salama, Perio 2000, 1996)



Periodontal Esthetics

The Role of the
Periodontium is to be
Inconspicuous

The Scaffold Matters



So Don't Forget the Scaffold

Periodontal Esthetics: treatment



A procedure is not a strategy...it is the logical extension of a collaborative effort

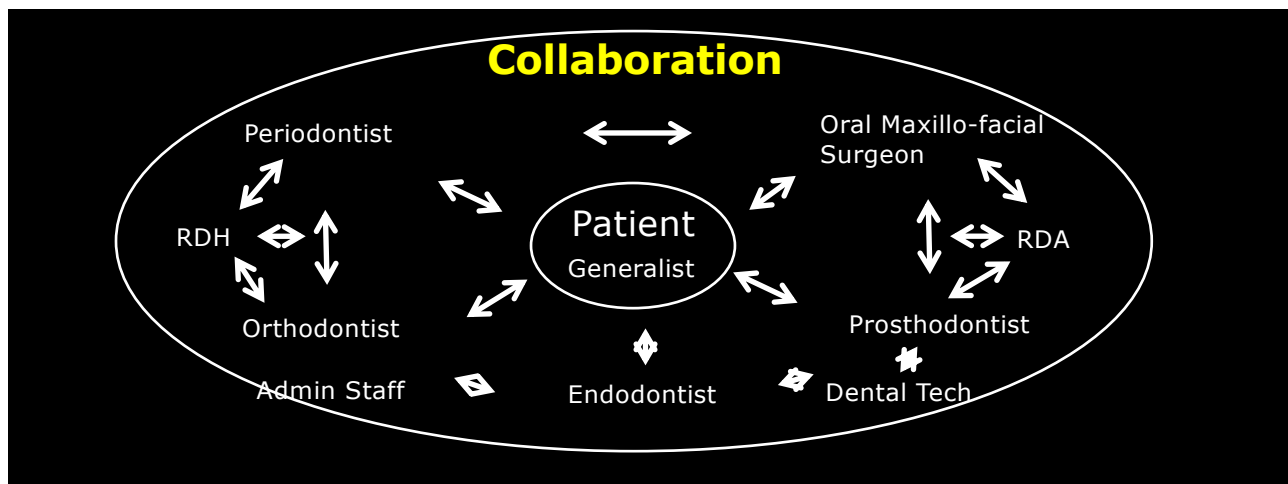
The Approach...

Multi-disciplinary

+

Inter-disciplinary





Periodontal Esthetics

- The denuded root
- Ridge deficiency: the ovate pontic
- Inadequate crown length
- Blended with orthodontics, restorative and implant dentistry

DENUDED ROOTS

*Mucogingival deformities and
conditions*



Periodontal reconstructive surgery

- *Root coverage*
- Tooth exposure
- Crown exposure
- Vestibular deepening
- Papilla reconstruction
- Ridge augmentation
- Ridge preservation



Rationale:

*Reconstruction of lost hard and soft
tissues*

Prevent additional loss

Improve appearance

AAP Report, J Perio 2005

Esthetic soft tissue grafting and natural teeth

Clinical questions

1. What do we know about gingival recession?
2. What are we trying to achieve in treatment?
3. What procedures produce the best results?
4. What patient, site-related factors effect predictability?
5. How can they help your treatment planning?

Soft tissue grafting: background

Why is it important?

- Gingival recession is common
- Negative consequences
- We have treatment that works

Development of the
Esthetic Concept

Recession: prevalence

Presence and severity increases with age

- One or more sites

18-64 yo 50%

≥65 yo 88%

- 60 yo

90% ≥ 1 mm,

40% ≥ 3mm

**Pretty
much
everyone!**

- Average recession: 2.76 mm
(Lost, J Clin Perio, 1984)



(Kassab, Cohen JADA, 2003, AAP Report, 2005)

Recession

Definition
Etiology
Consequences
Treatment



Recession: definition

Apical migration of the gingival margin from the CEJ, exposing the root surface



Recession etiology: inflammation

Mechanical factors



Periodontitis



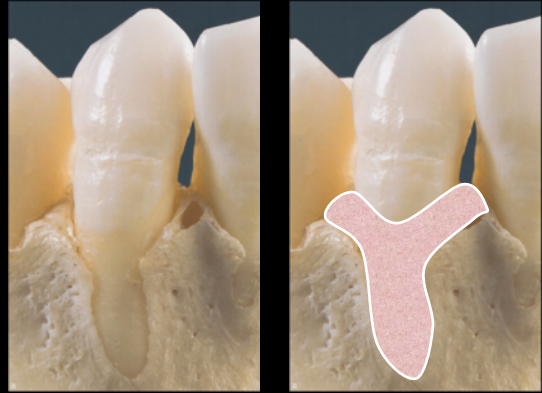
+
ANATOMY

Periodontal Dehiscence

Absence or loss of bony plate

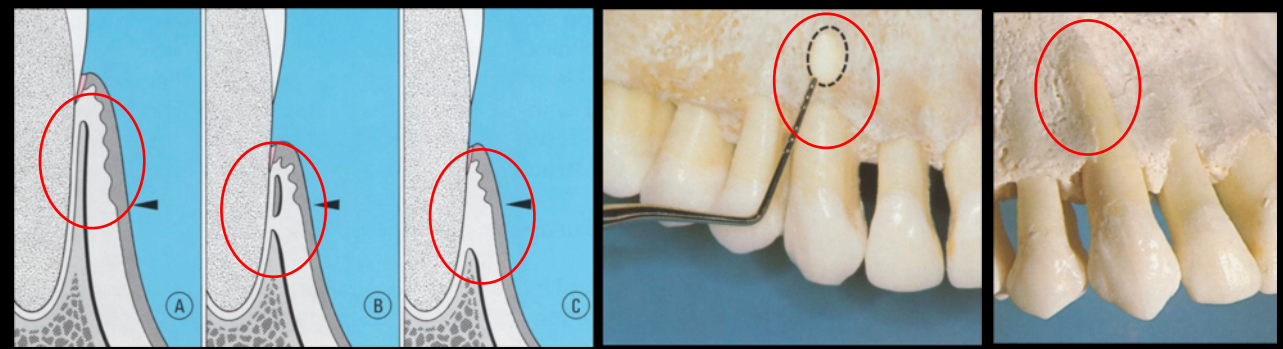
Etiology: naturally occurring inflammation + thin bone migration/ ortho

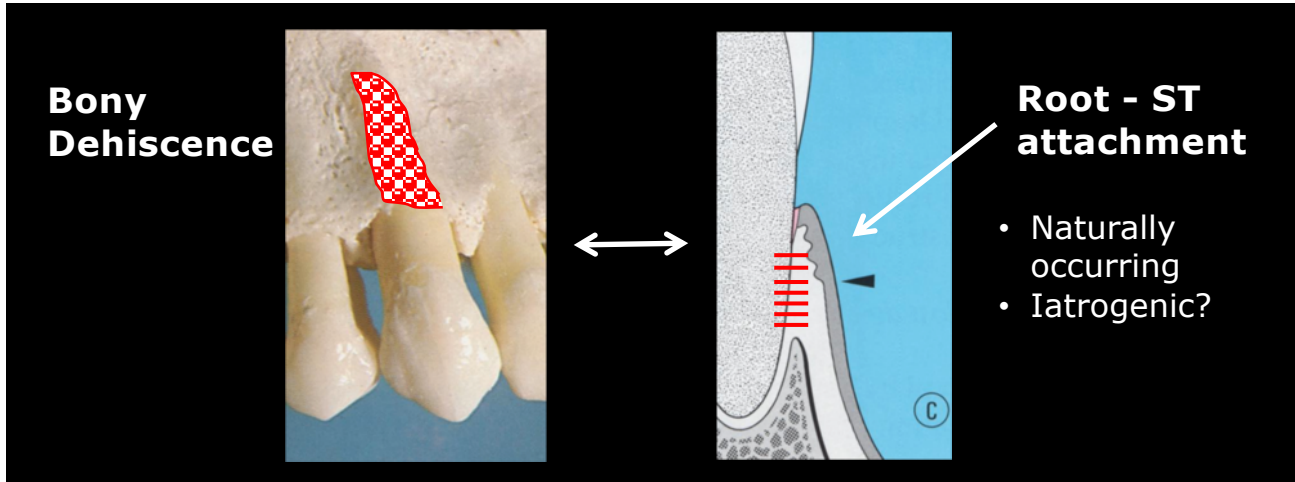
Effect: direct attachment of soft-tissue to root



Dehiscences & Fenestrations

Health Fenes Dehisc Fenestration Dehiscence



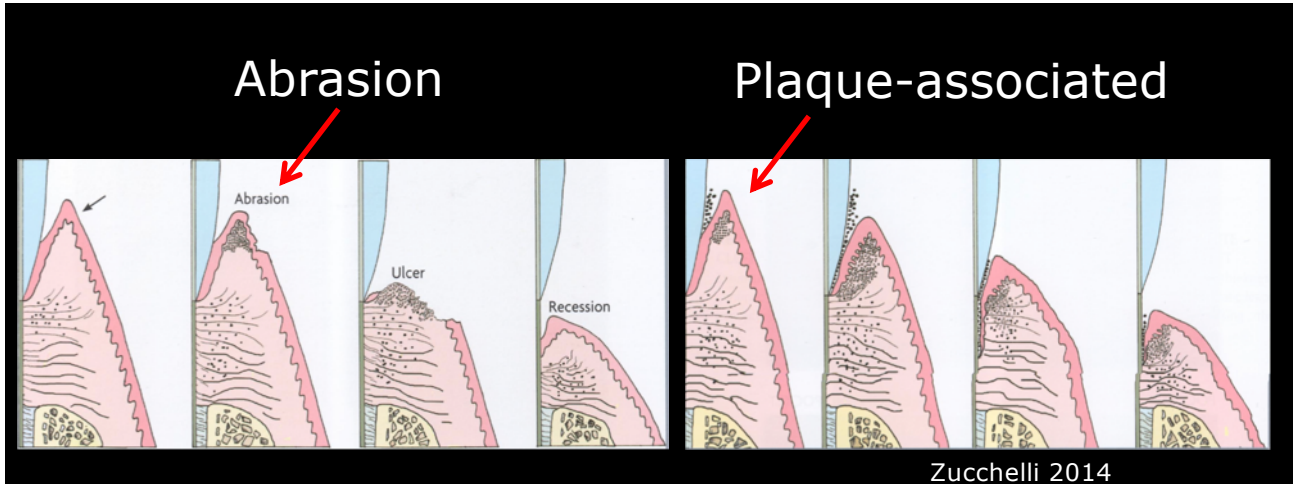


Dehiscences & Fenestrations

Prevalence of dehiscences and fenestrations in modern **American** skulls. J Periodontol. 2001 Jun;72(6):722-9. Rupprecht RD, et al.

- **Dehiscence in 40.4%** of the skulls
- **Fenestration in 61.6%** of skulls
- 67% of dehiscences found in the mandible
- 58% of fenestrations found in the maxilla





Risk

Buccal Dehiscence

- Anatomical
- Malposition
- Ortho
- Periodontitis
- Surpa-crestal tissue violation
- Occlusal trauma ?



Gingival Recession

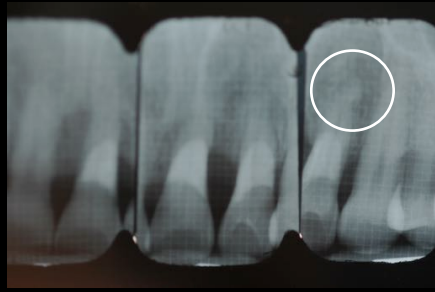
- Toothbrush
- Plaque
- Frenum
- Oral habits
- Sub-G restorations
- Iatrogenics
- Age

Zuhr, Herzler
2014



Recession: consequences

- Reduced support
- Root exposure
- Damage
- Sensitivity
- Caries
- Pulpal
- Restorations
- Esthetics



Recession: consequences

Structural Damage

- Abrasion
- Erosion
- Non-carious cervical lesions
- Caries



Rationale for Treatment of Gingival Recession with Root Coverage

- Arrest progression of recession
- Control sensitivity
- Facilitate plaque control
- Prevent caries
- Protect denuded root from continuing damage
- Improve appearance



Recession: treatment

I. Behavior modification



Oral hygiene activities

Infection

Trauma



II. Surgical Repair



Recession: treatment

FUNCTIONAL

- Improve weak anatomy
- Thicken tissue
- Arrest recession
- Not intended to cover root

SURGICAL REPAIR



FUNCTIONAL AND ESTHETIC

- All the other things
- Cover part or all of root

Esthetic Concept

Soft tissue grafting

Earlier treatments

- Functional (sensitivity, shallow caries)
- Preventive (arrest progression)

Esthetic procedures less predictable
root coverage
natural color



Soft tissue grafting: background

Esthetic Concept

More Recent treatments

- Patient esthetic demand

Improved Esthetics, Predictability
root coverage
natural color



Recession: rationale for treatment

Today!

Treatment aimed at preventing attachment loss, providing comfort, improved function and **appearance**.




Esthetic Root Coverage: Goals

Natural Appearance
 Cover root
 Normal color

Functional
 Masticatory mucosa
 Adequate thickness to resist recession
 Keratinized?

Stand the test of time



Root Coverage Procedures

Pedicle grafts

- Rotational flaps
 - Laterally sliding
 - Oblique rotated
 - Double papilla
- Advanced flaps
 - Coronally positioned
 - Semilunar

Free soft tissue grafts

- Epithelialized
- Non-epithelialized connective tissue

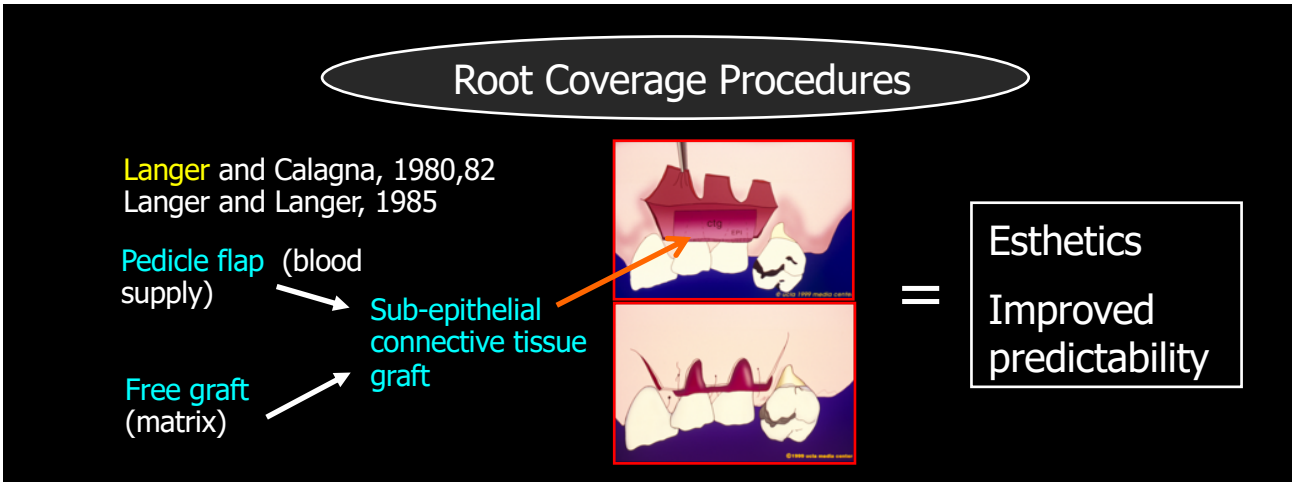
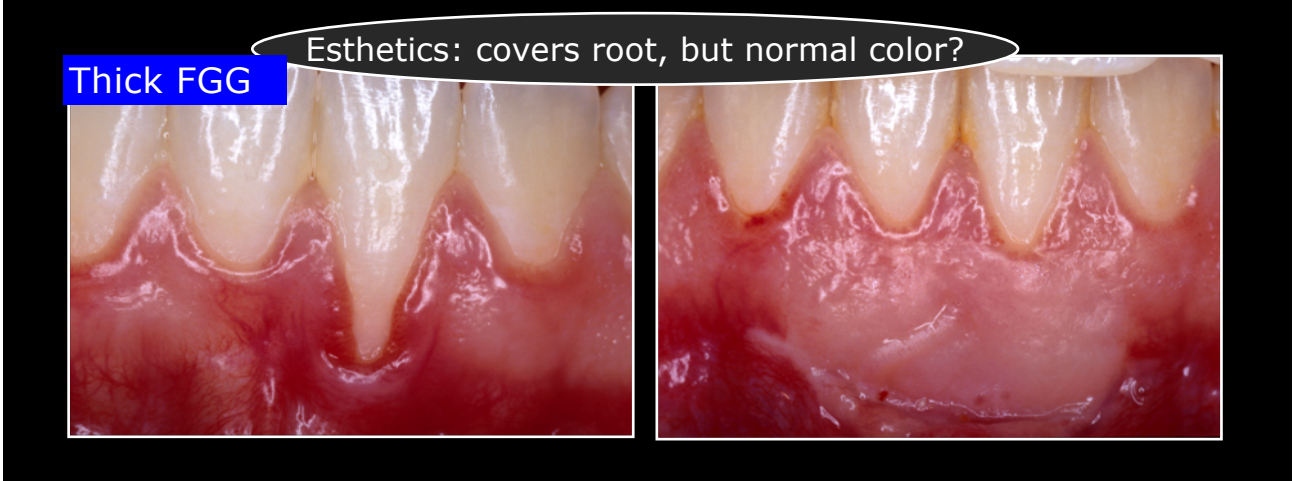
Bi-laminar grafts

- Sub-epithelial
- “Envelope”
- Bi-pedicle
- CAF+CTG

Which is “best”?

→ Esthetics

→ Predictability



Root Coverage Success: which is best?

Procedure	Mean Root Coverage (%)	% Complete Root Coverage
CT graft	85	60
Coronally positioned flap	80	50
Guided tissue regeneration	75	40
Laterally positioned flap	70	40
Free gingival graft	60	30

Sonick and Hwang, 2007

Factors relating to success

Patient Factors

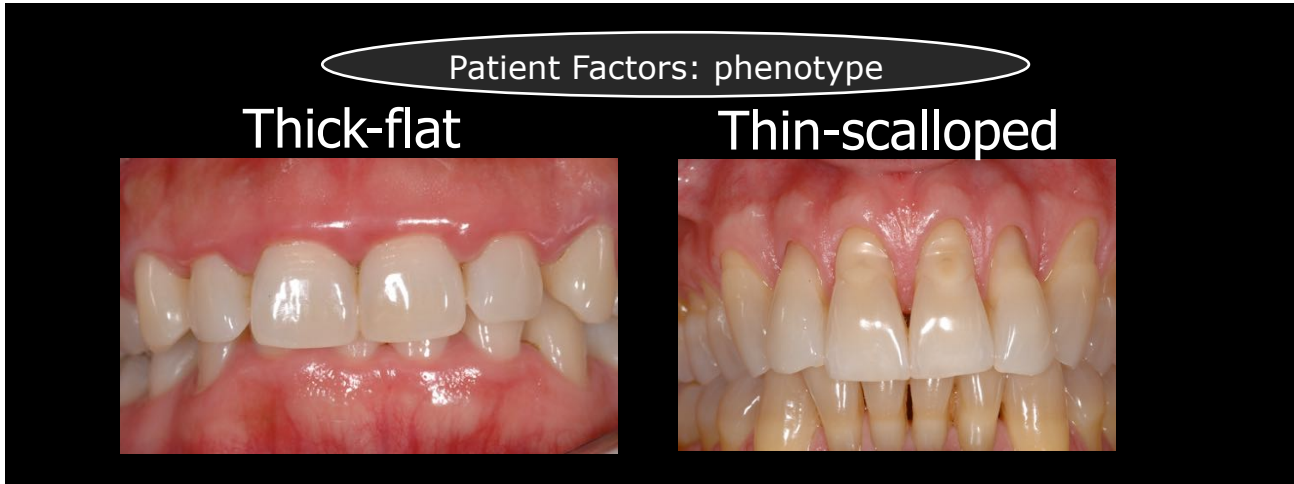
Patient expectations
Compliance
Smoking
Periodontal phenotype
Orthodontic history

Site-related

Defect classification
 Size of inter-dental papilla
 Defect dimension
Palatal anatomy

Technique-related


Root preparation
 Flap thickness
 Flap tension
 Flap position
 Graft orientation
 Graft thickness



Patient Factors: phenotype

Periodontal Biotype (BT)

- Thin highly-scalloped BT more often associated with recession than thick-flat. (Olsson & Lindhe, 1991, Muller & Eger, 2002)
- Thin BT has thinner masticatory mucosa than thick BT. (Muller et al, 2000)
- Treatment procedures more predictable in thick-flat. (Saldetta, 2001)



Thicker is better

Patient Factors: ortho history

Orthodontic history

- Tooth position important factor in gingival recession and treatment results
- Facial tooth movement reduces buccal tissue thickness
- Risk of recession when tooth moved out of alveolar housing, ie, dehiscence.

(Wennstrom, 1987,96)

Root outside
buccal plate



“Locus minoris resistencia”

Patient Factors: ortho history

Orthodontic history

- Tooth position important factor in gingival recession and treatment results
- Facial tooth movement reduces buccal tissue thickness
- Risk of recession when tooth moved out of alveolar housing, ie, dehiscence.

(Wennstrom, 1987,96)

No longer hidden



“Locus minoris resistencia”

Miller Classification

- Classification of marginal tissue recession as it relates to potential treatment success



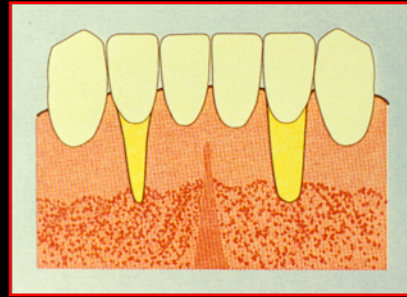
I. Does not reach MGJ

- No interdental bone or soft tissue loss
- 100% coverage possible



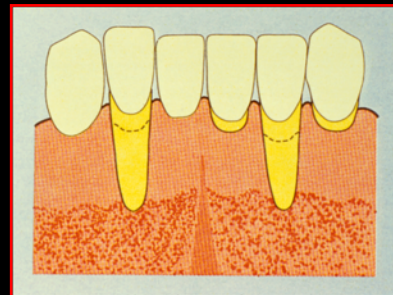
II. Extends to or beyond MGJ

- No interdental bone or soft tissue loss
- 100% coverage possible



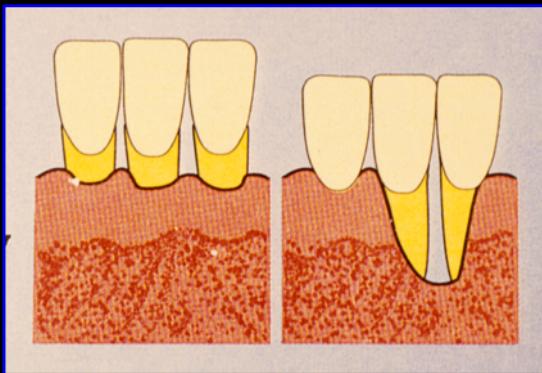
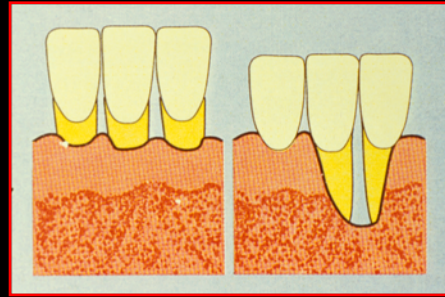
III. Extends to or beyond MGJ

- Interdental bone or soft tissue loss
- Malpositioning of teeth
- Partial coverage possible



IV. Extends to or beyond MGJ

- Severe interdental bone or soft tissue loss
- Coverage unlikely



Site-related factors: classification

“Zucchelli et al, J Perio 2006;77:714-721

Mistakes in selection of reference measurements

- CEJ completely detectable 30%
- Partially detectable 25%
- Undetectable 45%
- 90% cervical abrasion

Confusion of transposed CEJ with anatomic CEJ results in measurement mistakes and erroneous conclusions about treatment success.

Hidden Class III



Site-related factors: classification

“Zucchelli et al, J Perio 2006;77:714-721

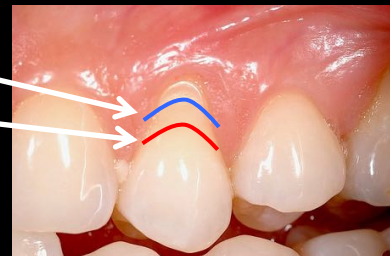
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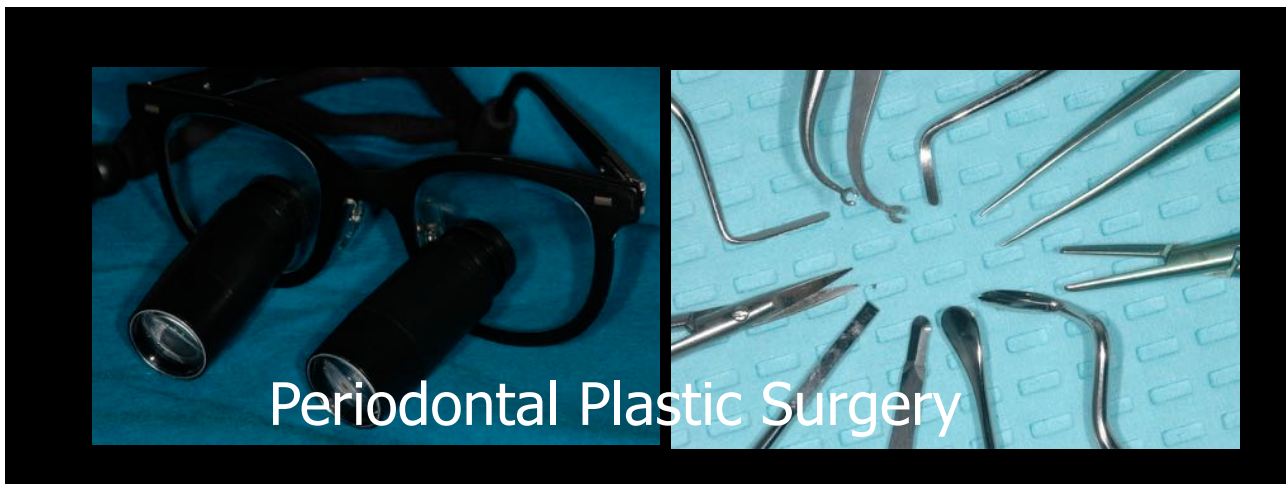
Hidden Class III

Anatomical
Clinical



Soft-tissue Graft Esthetic Risk Profile			
Esthetic Risk Factors	Low	Medium	High
Medical status	Healthy	Healthy	Unstable
Esthetic expectations	Low	Medium	High
Defect classification	Miller I, II	Miller I, II	Miller II, IV
Periodontal phenotype	Thick, low scalloped	Thick, scalloped	Thin, highly scalloped
Root position, prominence	Within arch	Slightly prominent	Very prominent
Defect width	Narrow	Moderate	Wide
Lip line	Low	Average	High
Smoking	Non-smoker	Light smoker	Smoker > 10 cpd
Compliance	Good	Fair	Poor

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Periodontal Surgery

“Blood supply is King but
Anatomy is Destiny”

Coronally Positioned Flap + CTG (multiple)



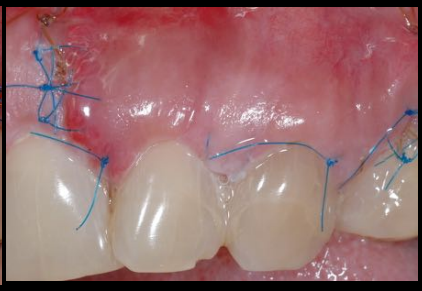
Miller I



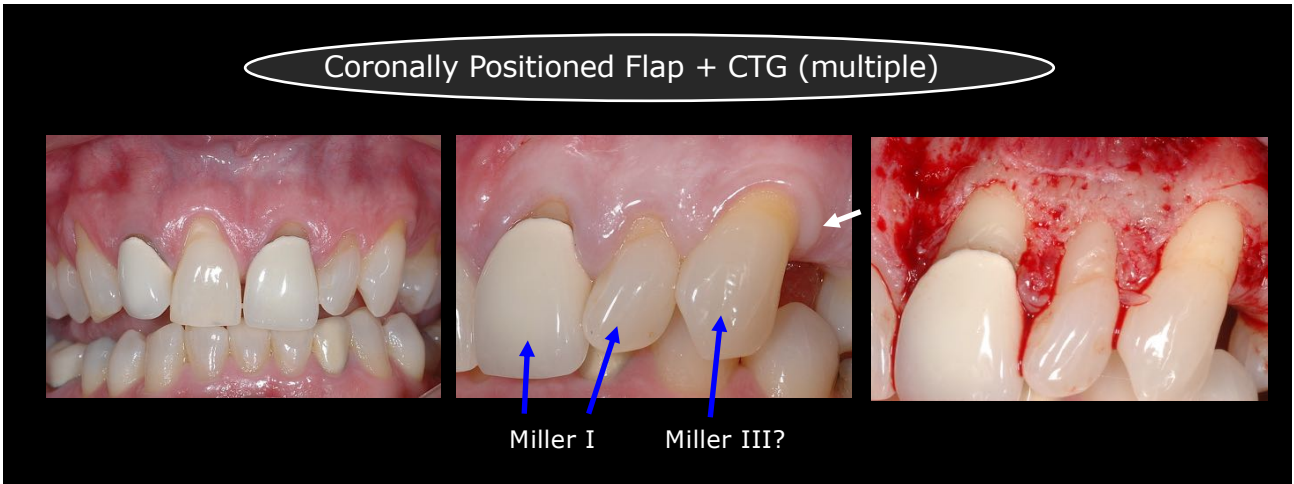
Graft secured at CEJ



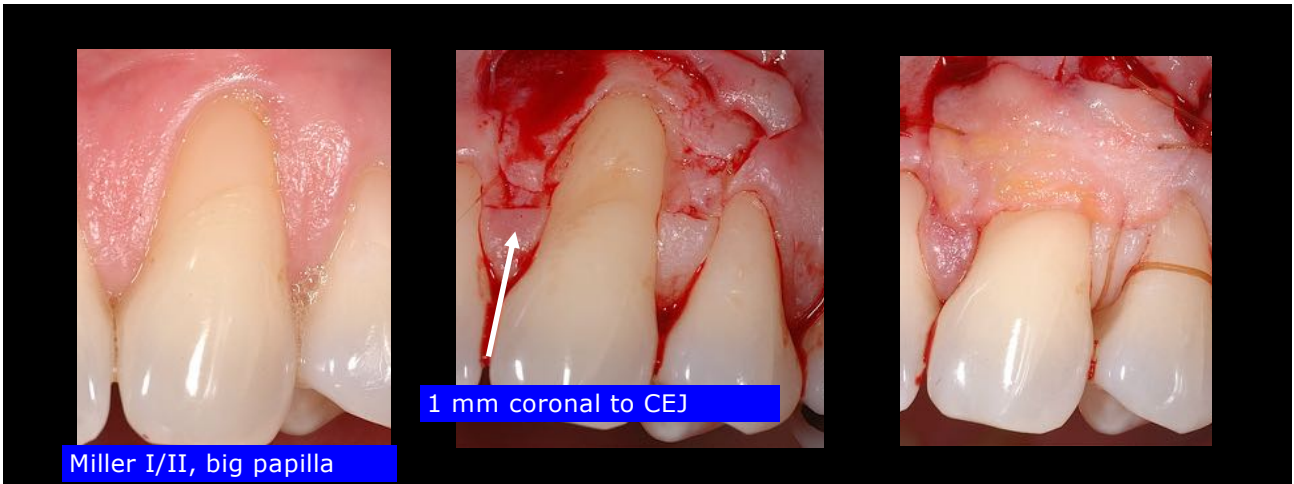
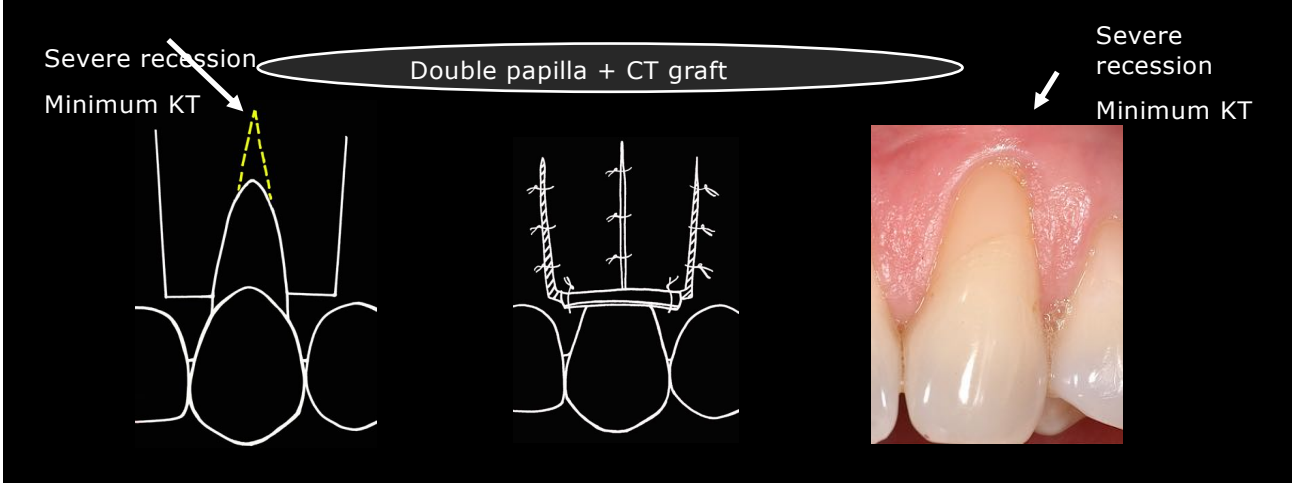
Flap advanced and closed



One week





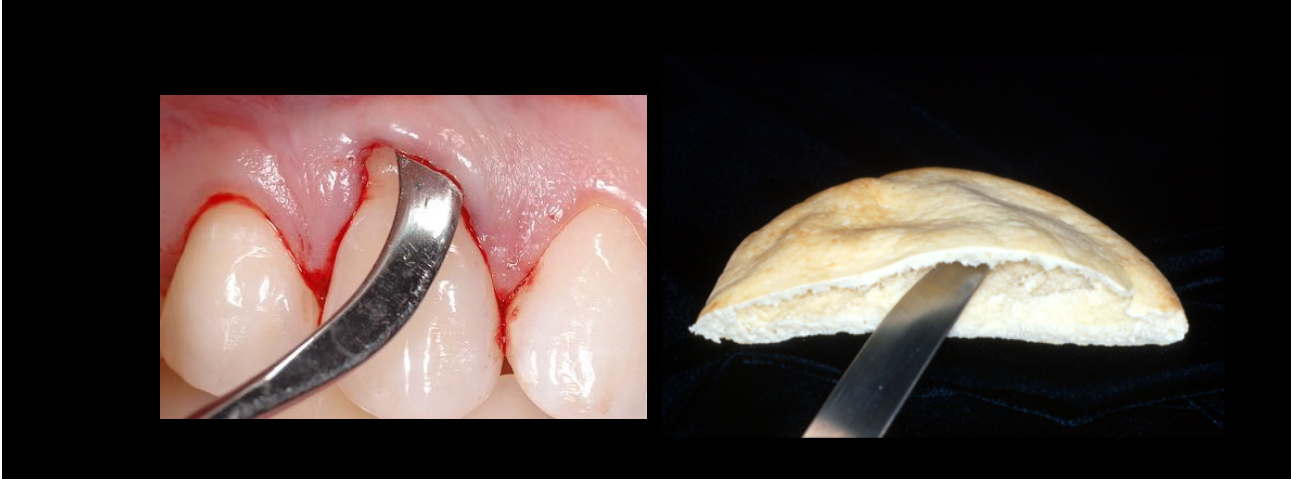
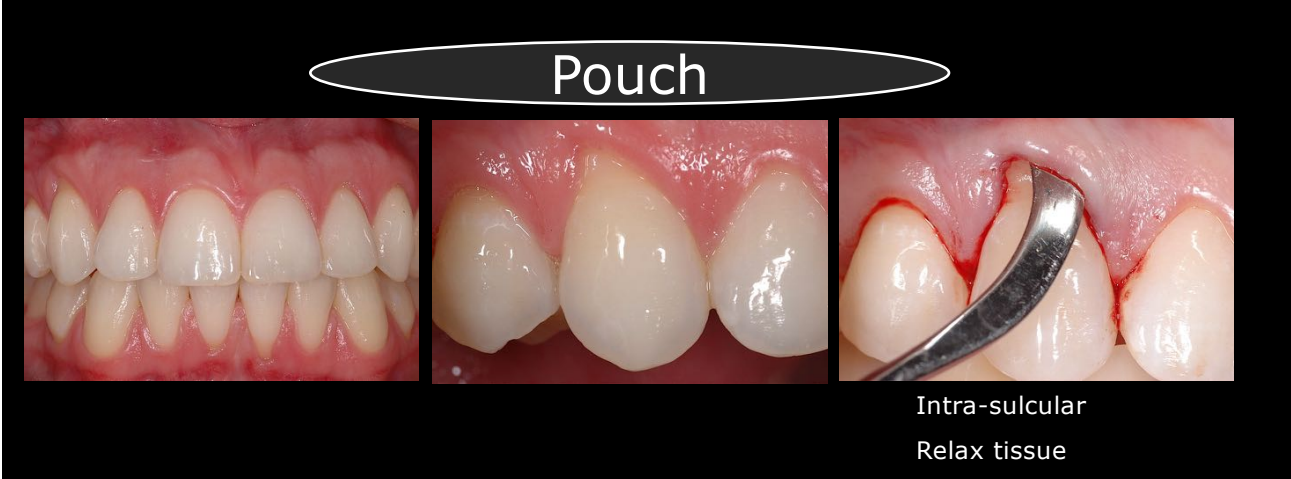


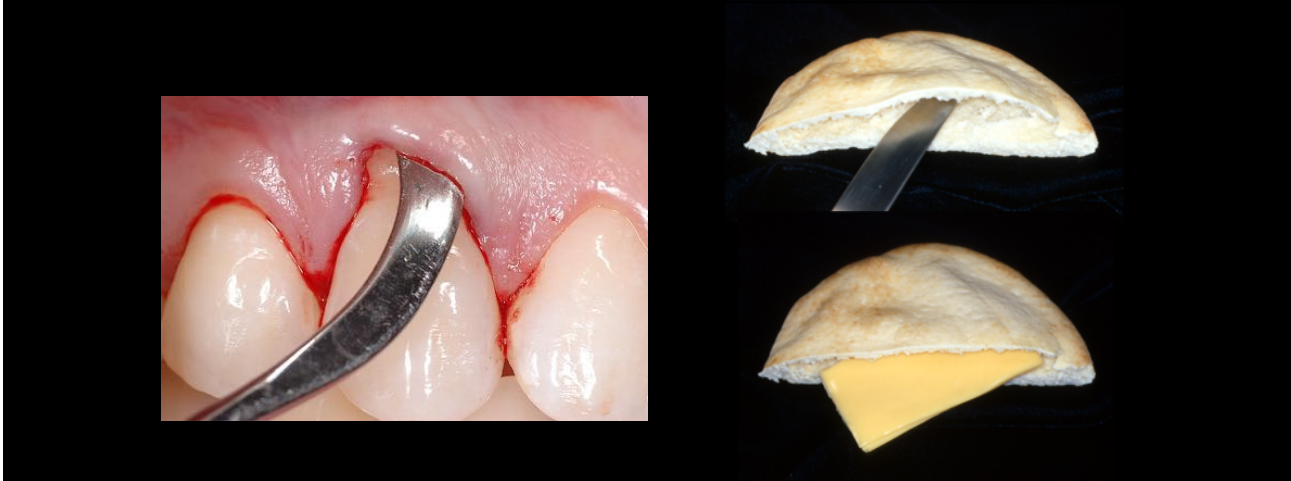


POUCH

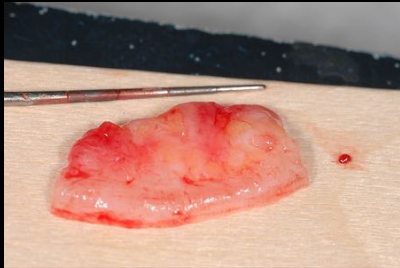
- Enhances blood supply
- improves predictability







Pouch



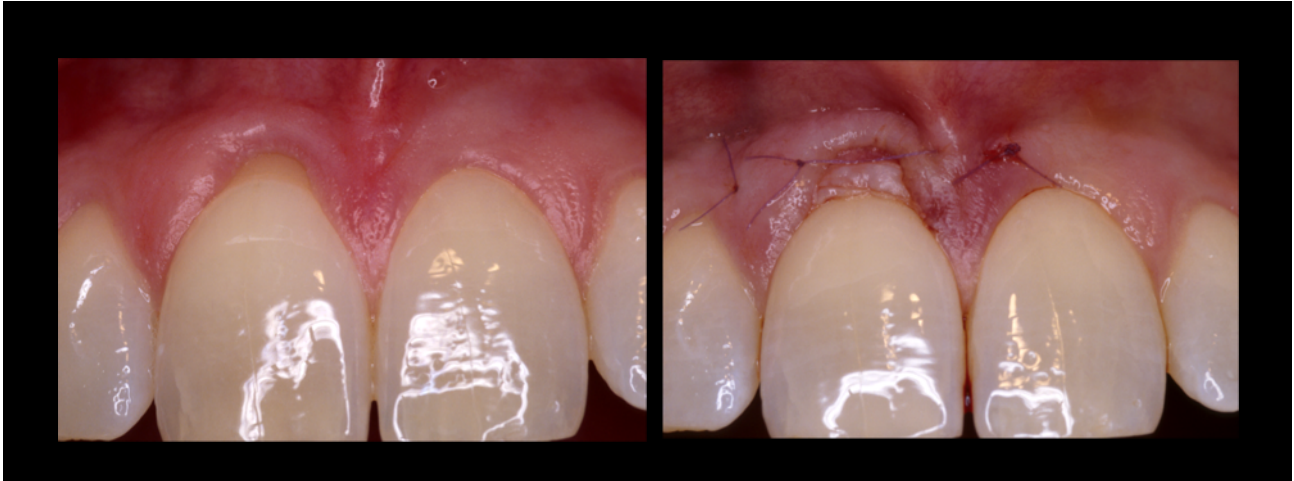
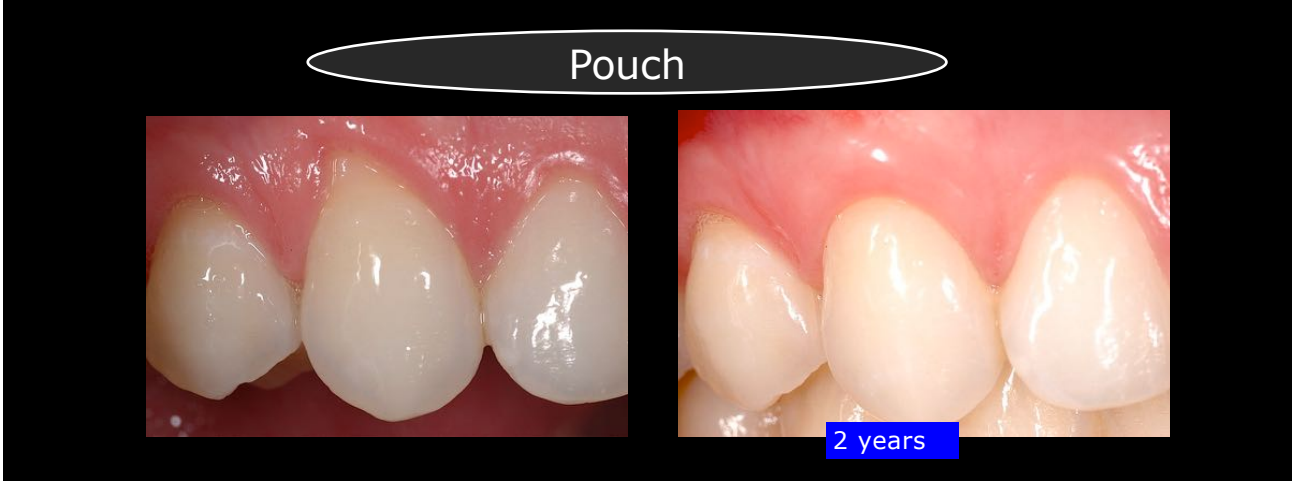
Tailor graft to fit

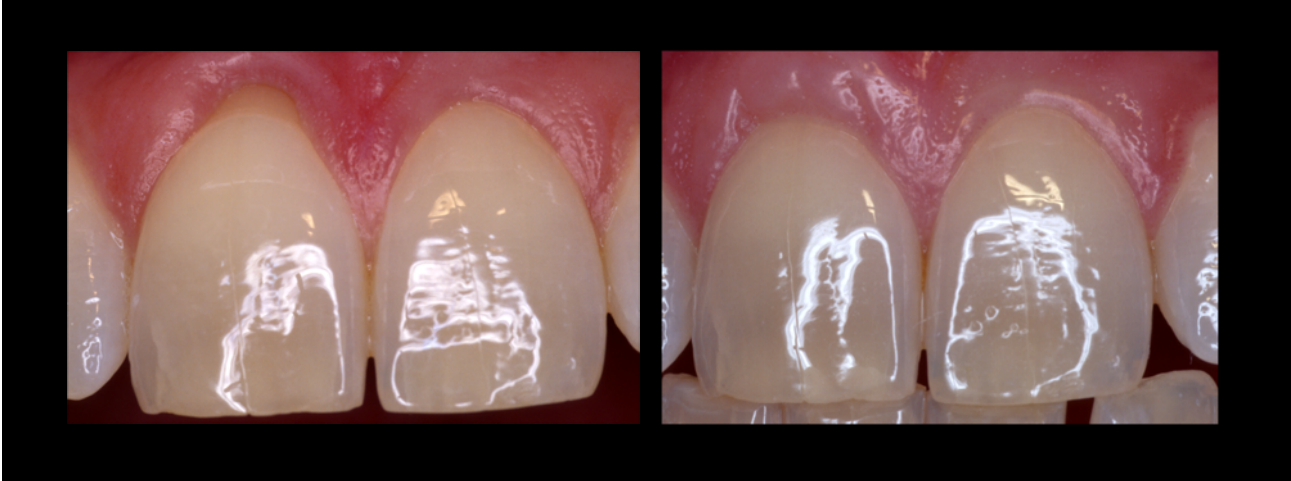


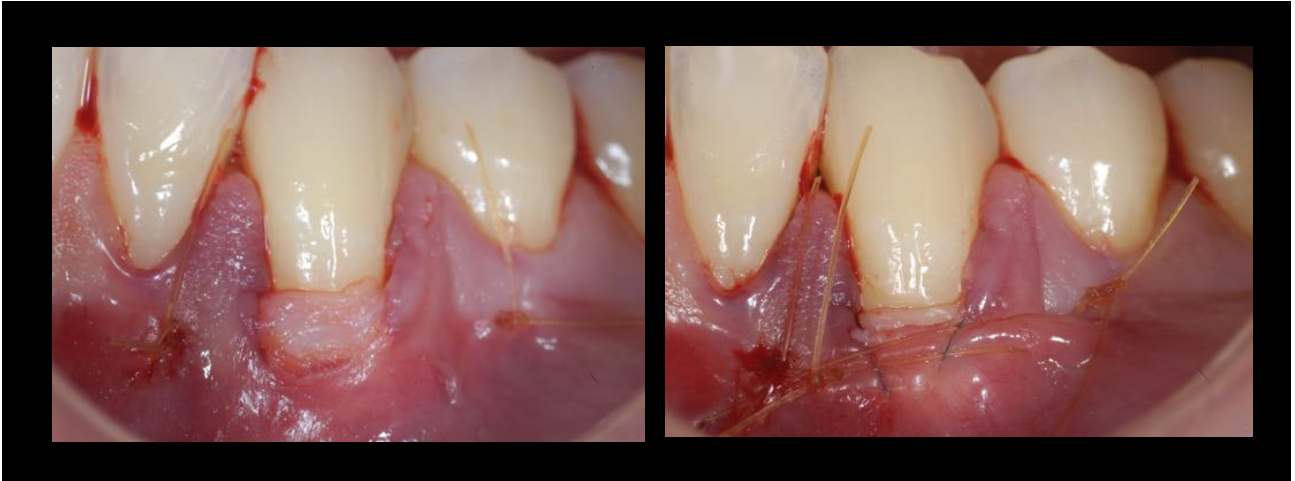
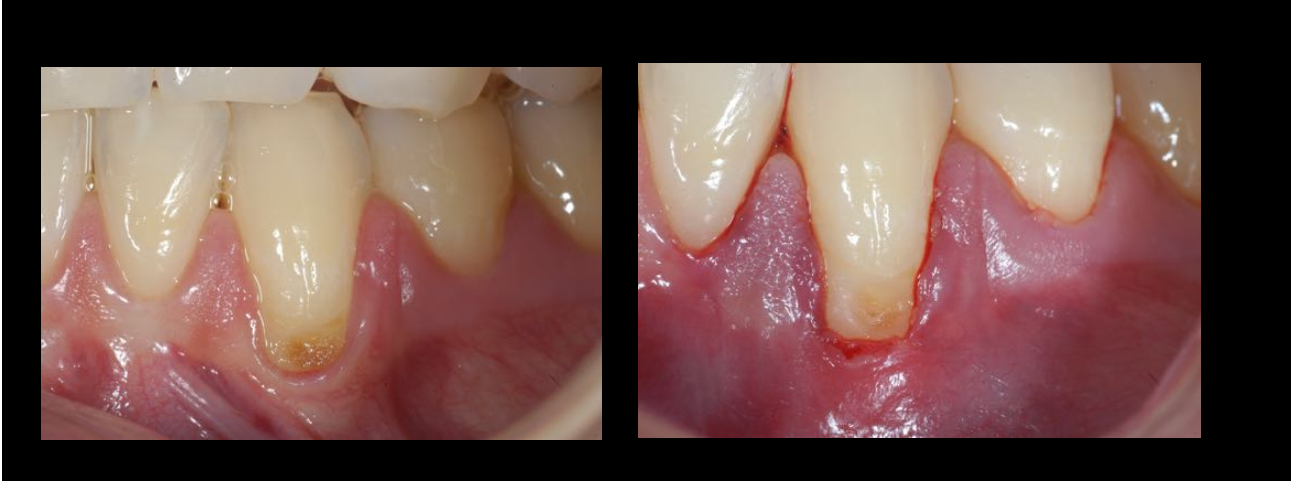
Slide graft into pouch

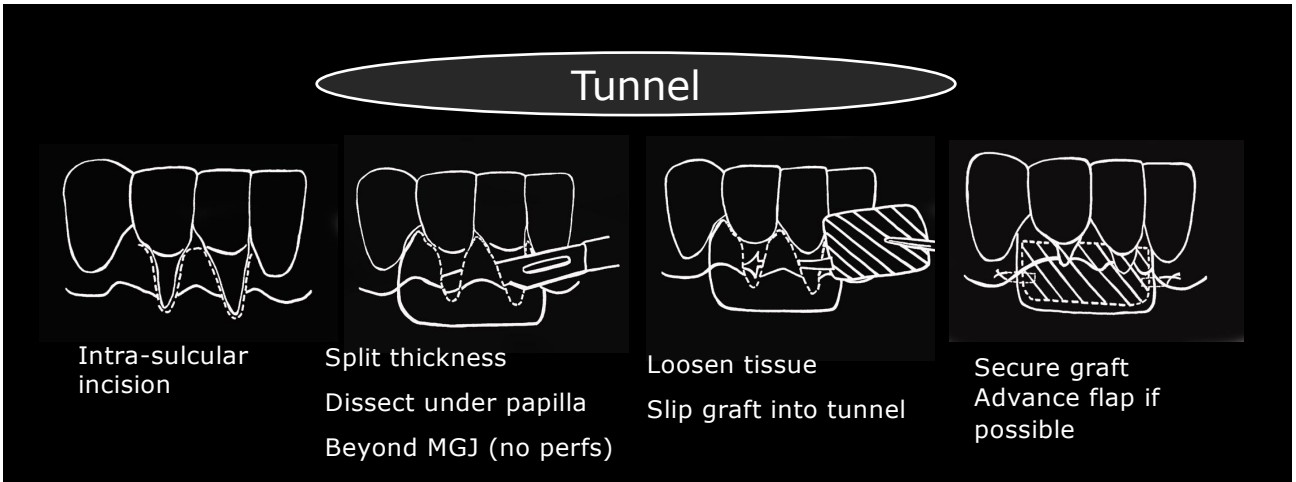


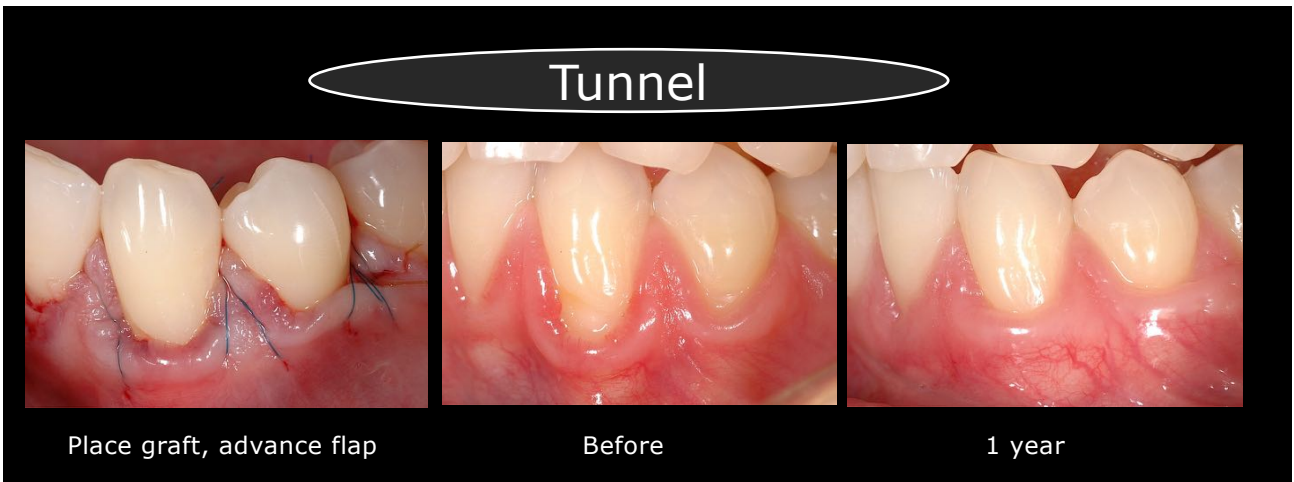
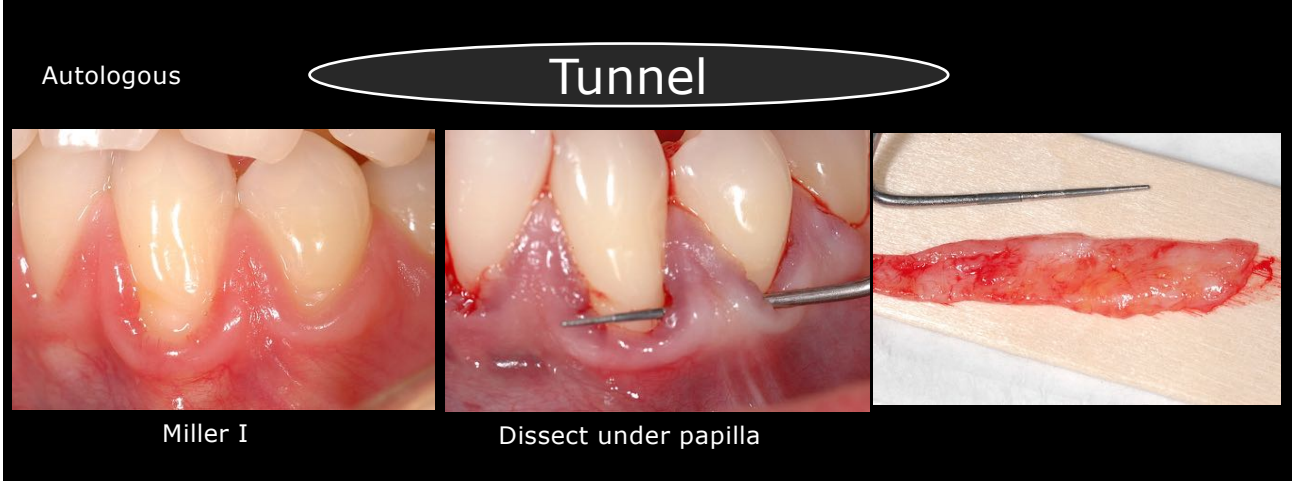
Secure graft











Allograft



Allograft

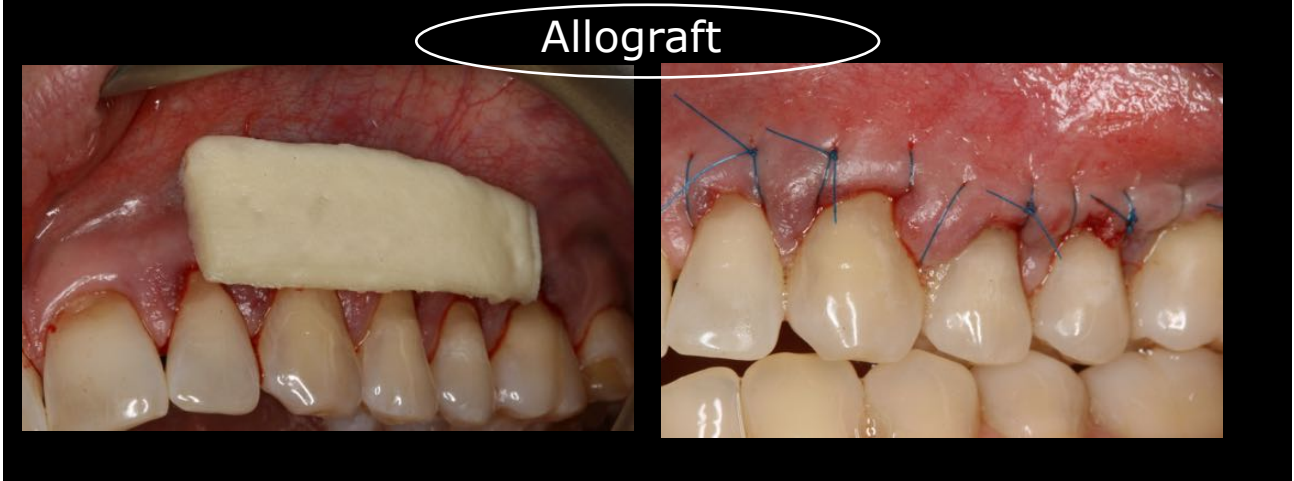


Allograft



Allograft





Variations



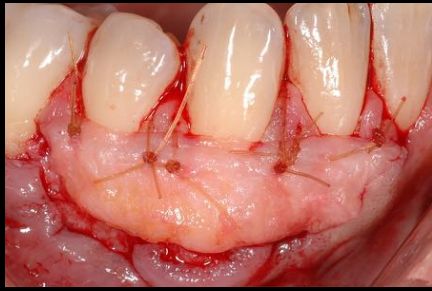
Miller I



CTG in Pouch



Partial flap advancement



Flap rotated coronally



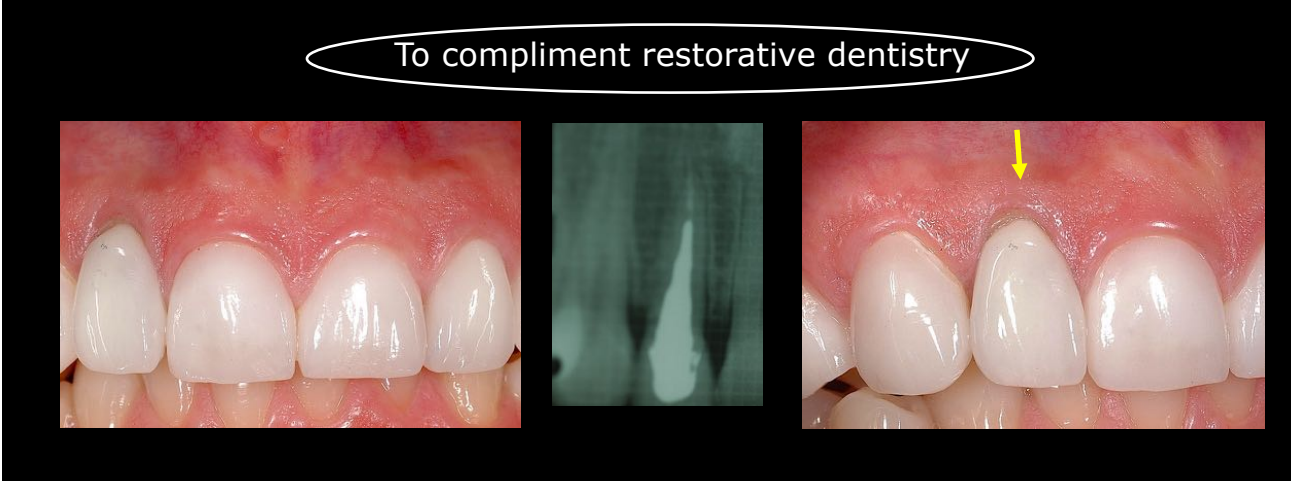
1 year

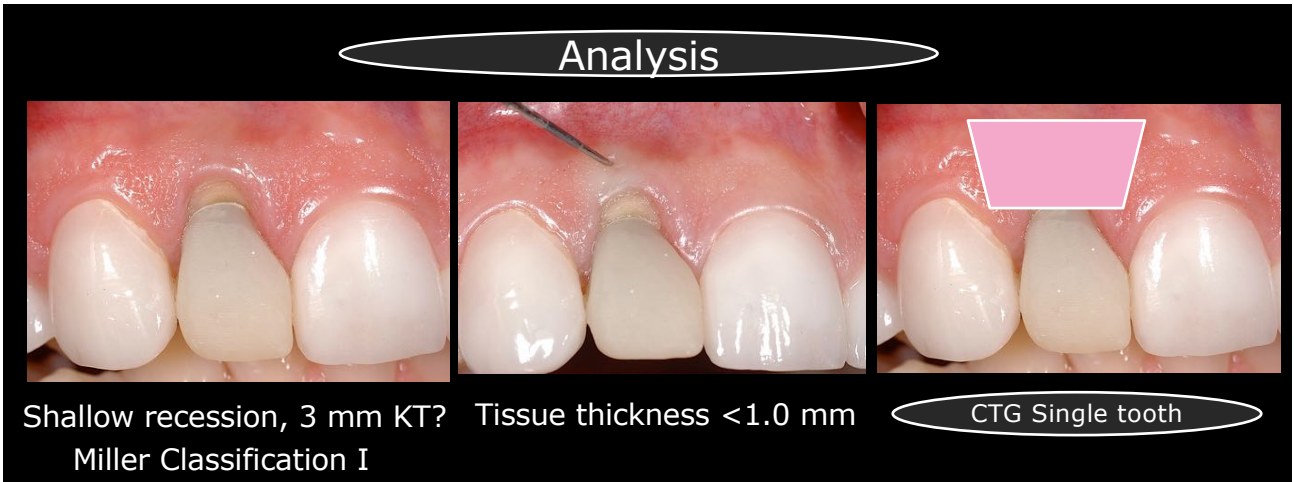
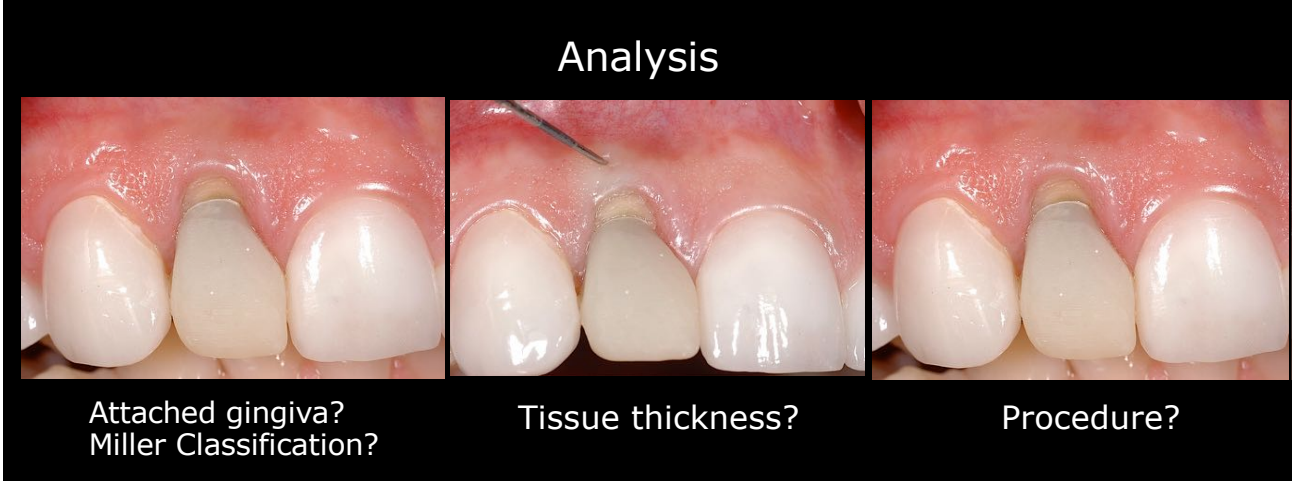


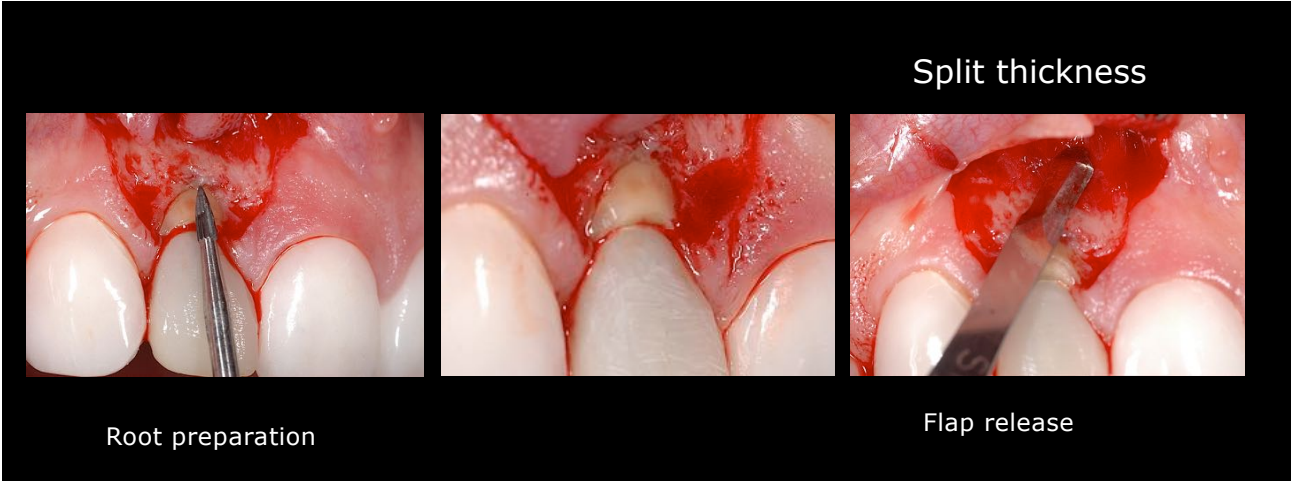
9 months

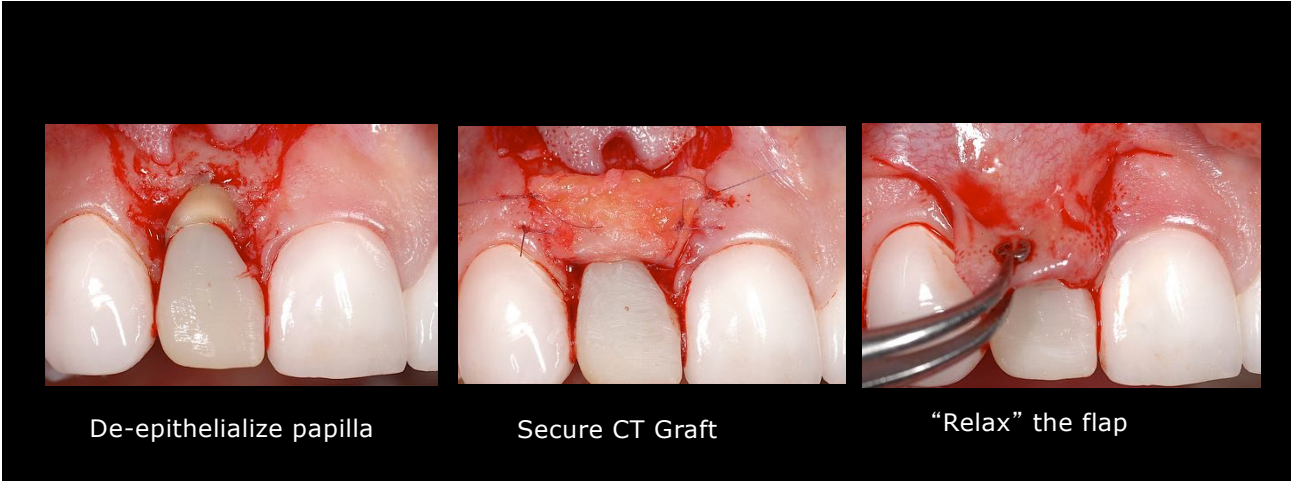
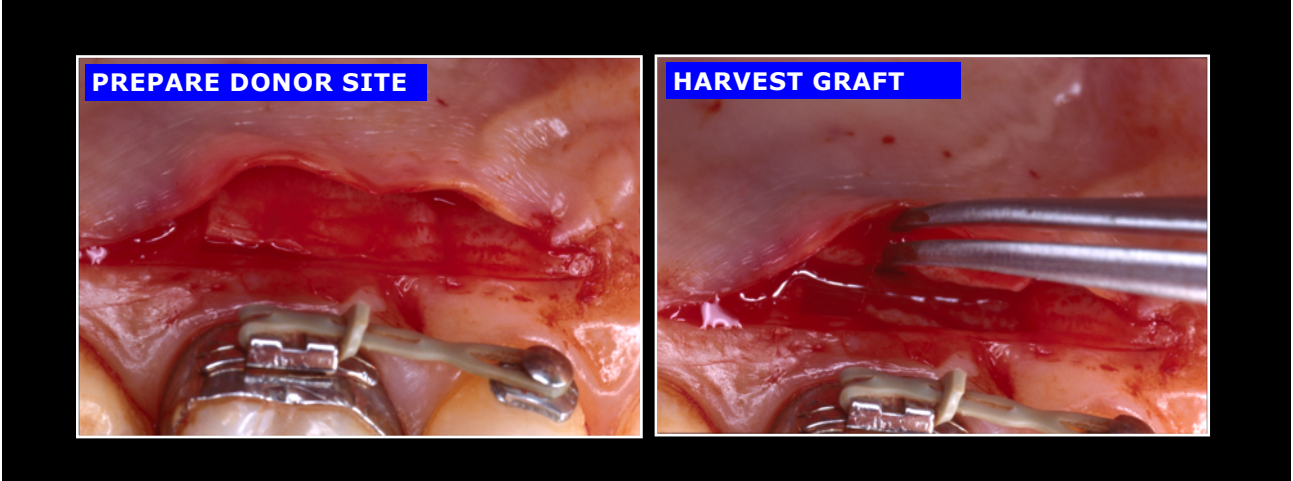


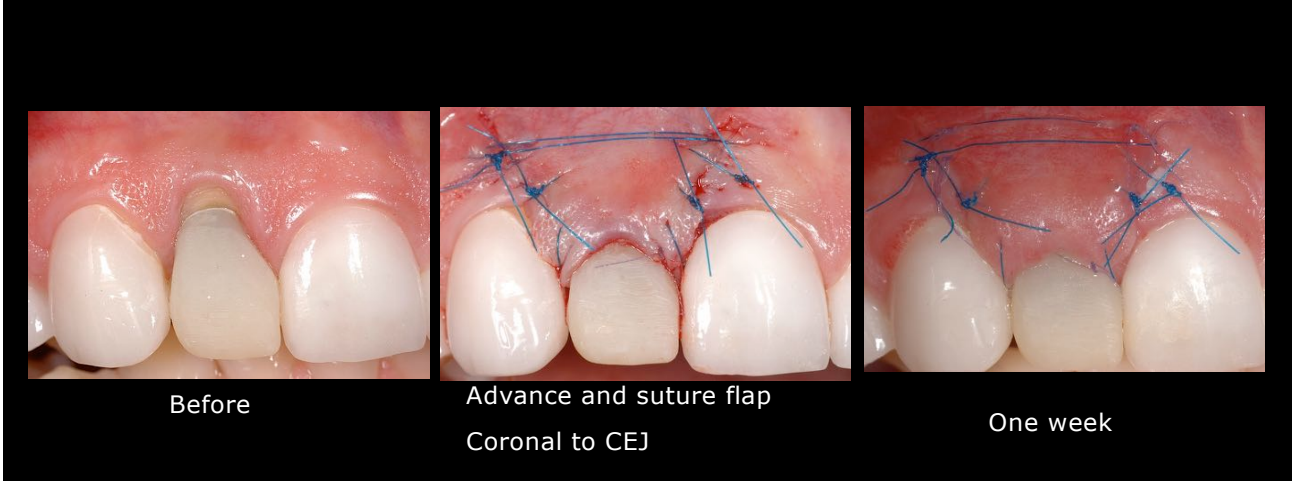
To compliment restorative dentistry



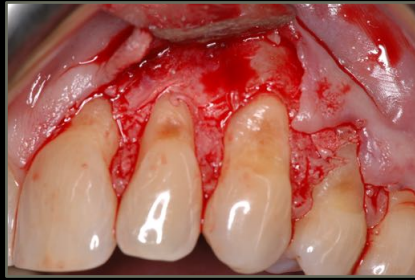








Caries/ erosion



P. Camargo

Caries/ erosion

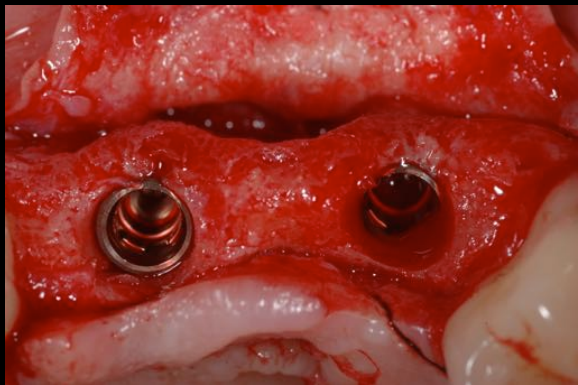


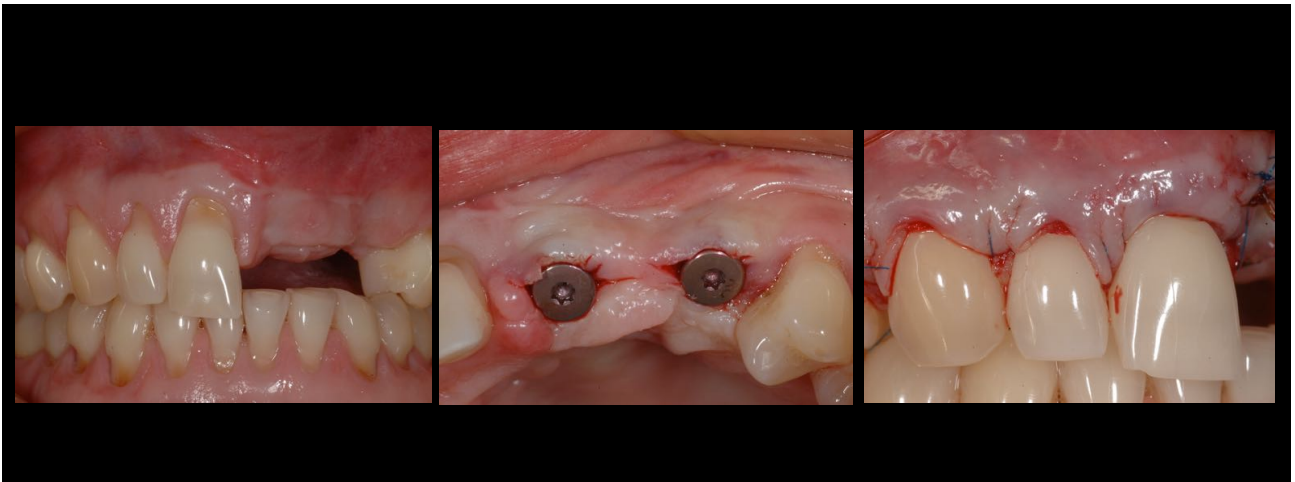
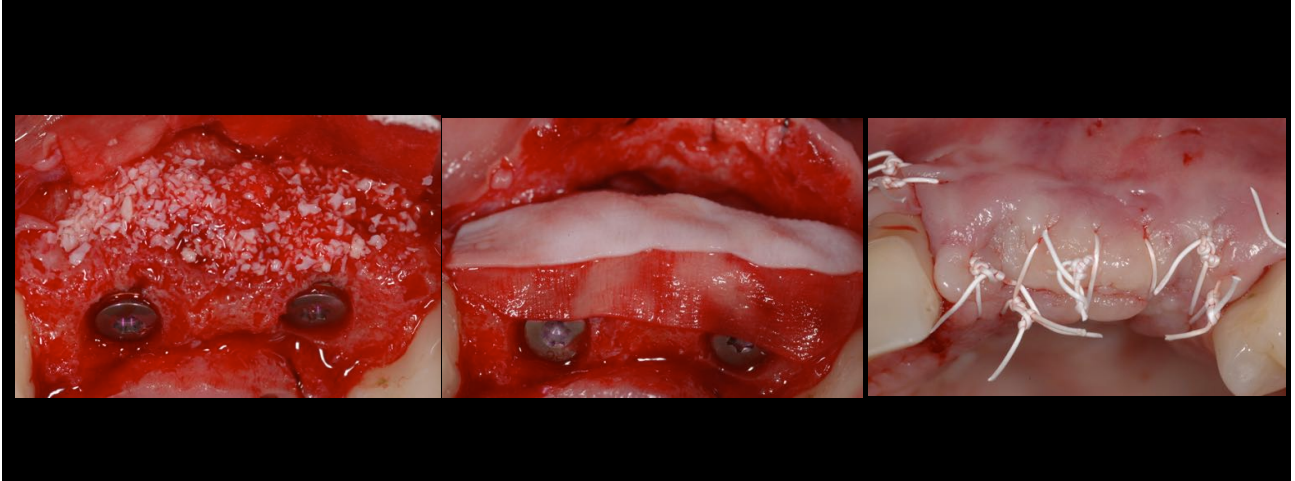
Support esthetic dentistry





Support implant dentistry



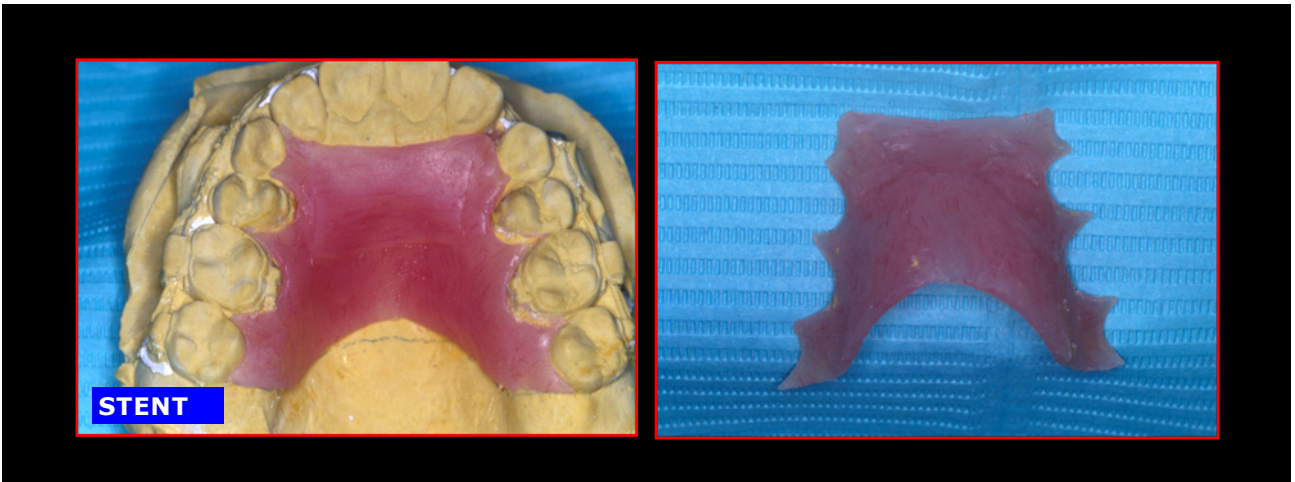
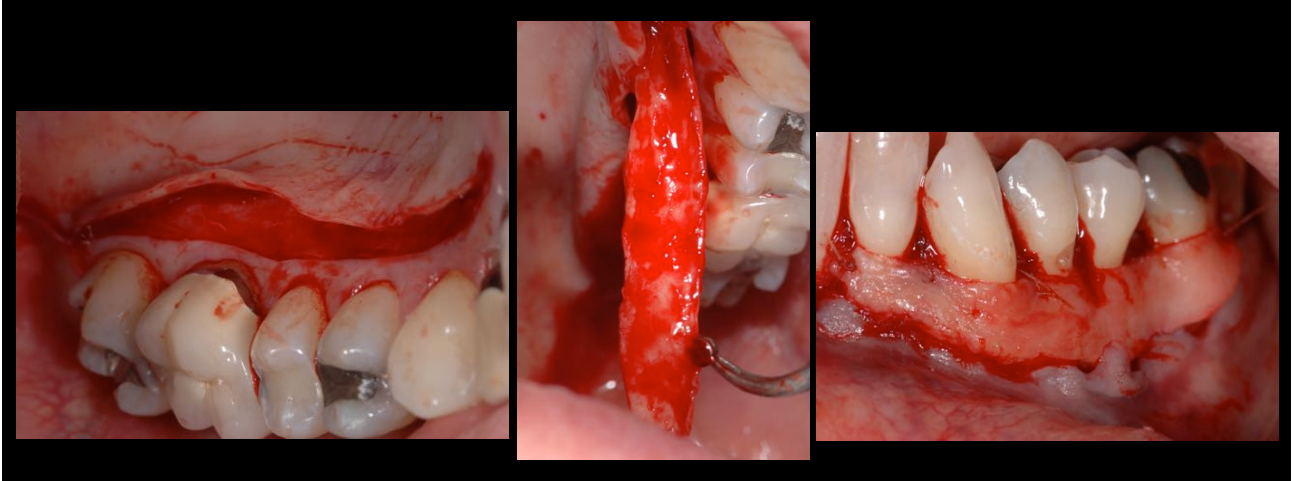






What about the palate?





What happens if a gingival recession is left untreated?

Aguido, G, J. Perio 2016

- Compared grafted and un-grafted contralateral sites (64/64)
- Mean 23.6 years
- Treated sites: recession was reduced by 83%
- Untreated sites: recession increased in 48%
- Amount of recession was limited

Conclusion: patients augmented with STG remain more stable

What are the reasons for treatment of gingival recession?

AACD 2013

- 659 interviews
- 89% of patients decided to seek treatment to improve physical attractiveness and self-esteem

Cortellini P, Bissada N, J. Perio 2017

What are the reasons for treatment of gingival recession?

Nieri M, et al, J. Clin Perio 2013

- 120 patients
- 96 had 783 gingival recessions
- 565 were unperceived by the patient
- Of 218 perceived recessions
 - 160 asymptomatic
 - 36 hypersensitivity
 - 13 had esthetic issues
 - 9 had esthetic and sensitivity
 - 11 patients requested treatment for 57 recessions

Esthetics & Sensitivity

Gingival recession and tooth mortality?

“Development and progression of gingival recession is not associated with tooth mortality”

Cortellini P, Bissada N, J. Perio 2017

**CREATING THE
ILLUSION OF
REALITY:**

***THE ESTHETIC
PONTIC***

**The
Ovate
Pontic**

The Problem:

Tooth loss, ridge resorption
and replacement in

The Esthetic Zone



Incidence

Abrams, et al JPD, 1987

- 34 anterior study casts
- 91% ridge defects



What happens
when you
remove a tooth?

*The socket shrinks
and changes shape*

Healing of the alveolar ridge following tooth extraction
**NATURAL HEALING
WITHOUT INTERVENTION**

	Horizontal Measurement	Vertical Measurement
Average loss ¹	3.79 mm	1.24 mm
Range of relative loss ¹	29-63%	11-22%

¹ Tan et al., 2012

P. Camargo

Tooth Loss and Ridge Resorption

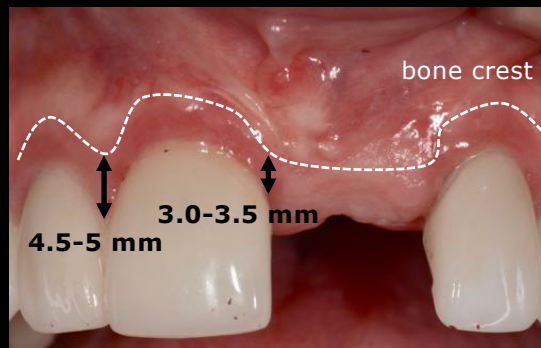
*What happens when
a tooth is lost?*

50% horizontal dimensional
loss after 12 months!



But wait...there's more...

When a tooth is
lost the papilla
shrinks...

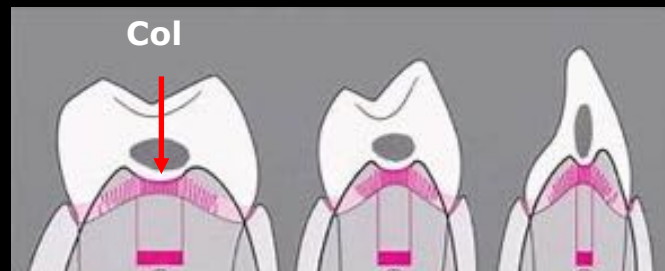


shrinks

1.5 -2.0 mm

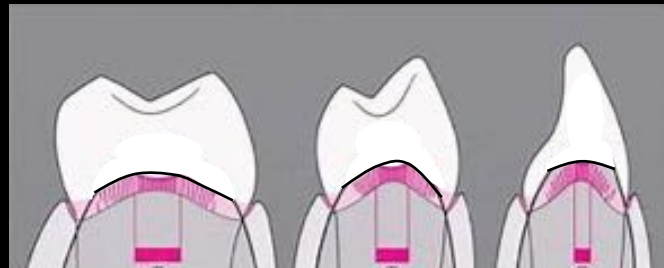
What happens?

The papilla is formed by the proximity and shape of the adjoining tooth surface under the contact point and the width of underlying bone



Cohen et al, BDJ, '59, Matherson & Zander, J Res D, 1963

Eliminate the contacting tooth and the papilla flattens



Prior Attempts at tooth replacement: Unnatural Appearance



Asymmetrical, too long



Space between pontic, ridge



Shadow from concavity

What can we do?



Asymmetrical, too long



Space between pontic, ridge



Shadow from concavity

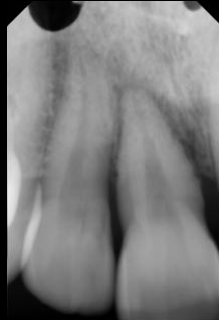
After tooth extraction: options

- Ridge preservation

- Ridge augmentation: hard tissue
- Ridge augmentation: hard + soft tissue
- Ridge augmentation: soft-tissue ≤ 3 mm



Ridge Preservation



Ridge Preservation



Ridge Preservation





Even with "ridge preservation" a residual defect remains



Rationale for alveolar ridge preservation
NATURAL HEALING VS. RIDGE PRESERVATION

		Horizontal Measurement	Vertical Measurement
Natural Healing			
	Range ¹	-0.16 to -4.50 mm	-0.30 to -3.75 mm
	Average Loss ²	3.79 mm	1.24 mm
Ridge Preservation			
	Range ¹	3.25 to -2.50 mm	1.30 to -2.48 mm
	Average Loss ³	±1.50 mm	±0.50 mm
Ridge Preservation Minus Natural Healing	Average Difference ¹	1.83 mm	1.47 mm

Natural Healing

2.5 x greater loss of H ridge dimension

4 x greater loss of V ridge dimension

¹ Vignoletti et al., 2012
² Tan et al., 2012
³ Estimated

P. Camargo

Rationale for alveolar ridge preservation

NATURAL HEALING VS. RIDGE PRESERVATION

		Horizontal Measurement	Vertical Measurement
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Ridge Preservation Minus Natural Healing	Average Difference ¹	1.83 mm	1.47 mm

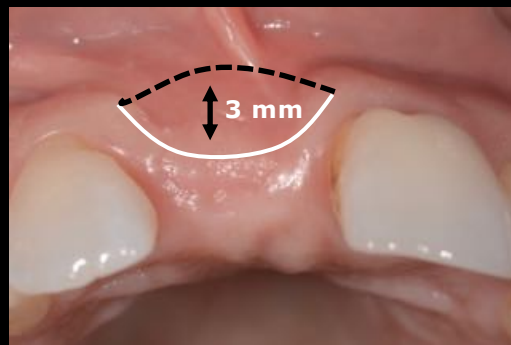
Ridge preservation improves but does not eliminate the defect

¹ Vignoletti et al., 2012² Tan et al., 2012³ Estimated

P. Camargo

SOFT-TISSUE AUGMENTATION

≤3 mm Rule



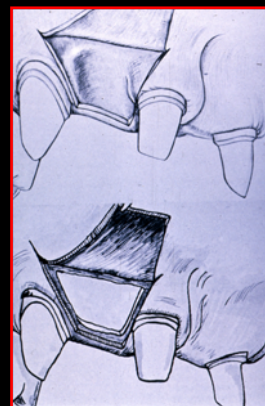
After tooth extraction: options

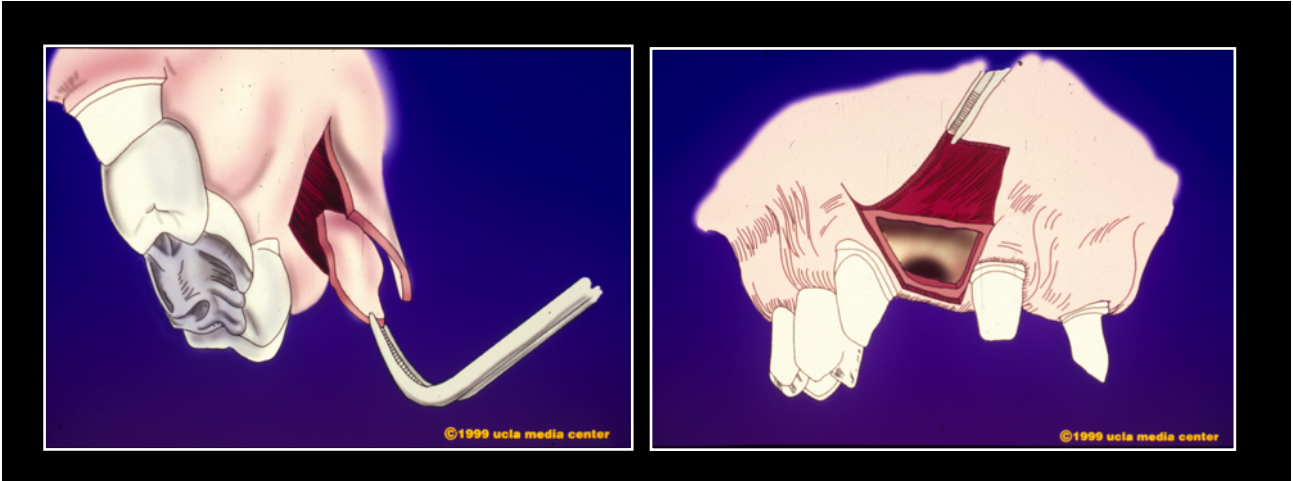
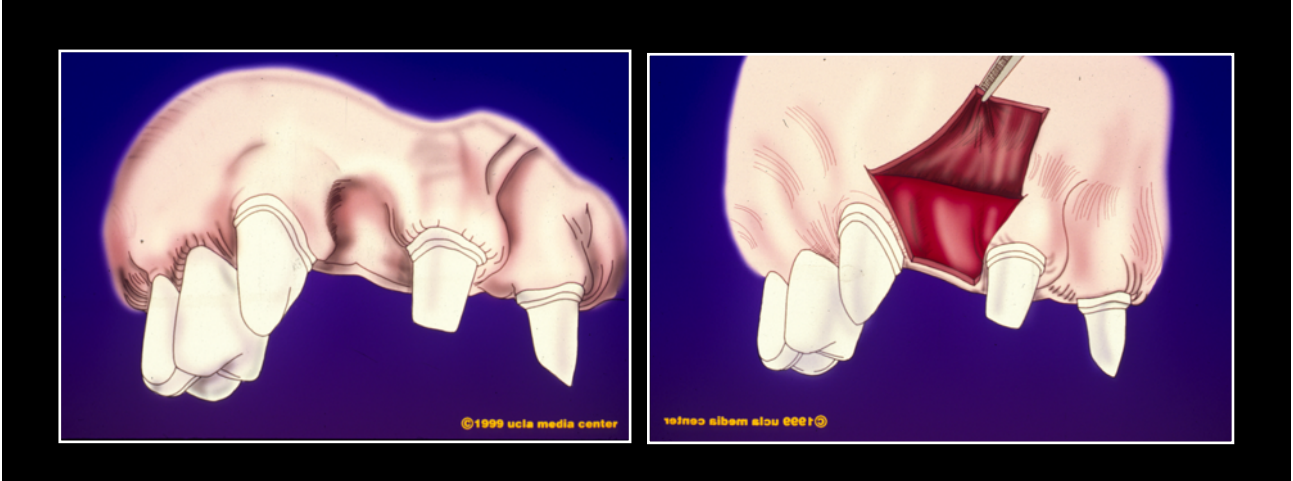
- Ridge preservation
- Ridge augmentation: hard tissue
- Ridge augmentation: hard + soft tissue
- Ridge augmentation: soft-tissue

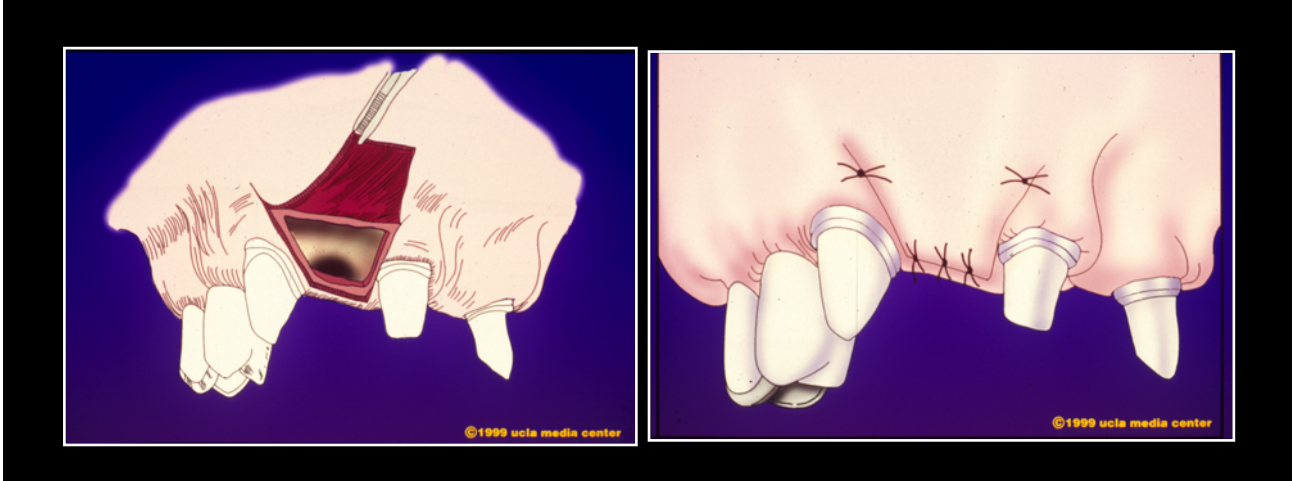


CONNECTIVE TISSUE RIDGE AUGMENTATION

Langer and Calagna
(1982)





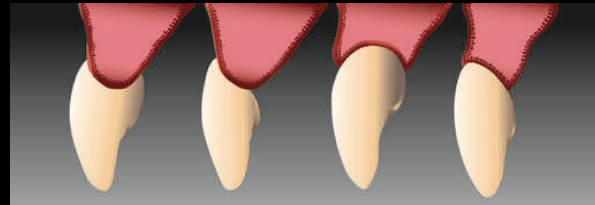


**CREATING THE
ILLUSION OF
REALITY:
THE ESTHETIC
PONTIC**

**The
Ovate
Pontic**

EMERGENCE PROFILE: Ovate Pontic

- “Emerges” from, rather than rests on the ridge



(Abrams 1980, Garber and Rosenberg 1981)

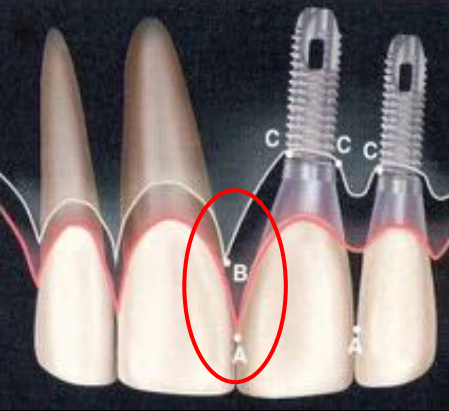
OVATE PONTIC

(Abrams 1980, Garber and Rosenberg 1981)

- Improves esthetics
- Placed within ridge
 - “Free gingival margin”
 - “Interdental papilla”



CLASS	Restorative Environment	Proximity Limitations	Maximum Papilla Ht
1	Tooth-Tooth	1	5 mm
2	Tooth-Pontic	N/A	6.5 mm
3	Pontic-Pontic	N/A	6.0 mm
4	Tooth-Implant	1.5mm	4.5 mm
5	Implant-Pontic	N/A	5.5 mm
6	Implant-Implant	3mm	3.5 mm



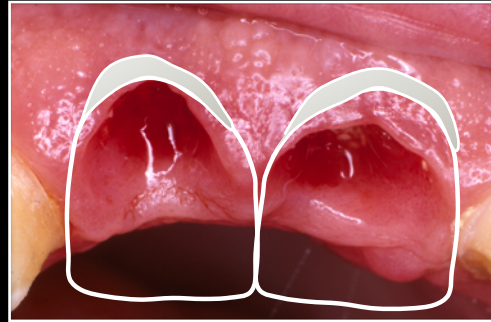
How does it work?

It mimics nature by placing the facsimile of a tooth shape next to another tooth or pontic



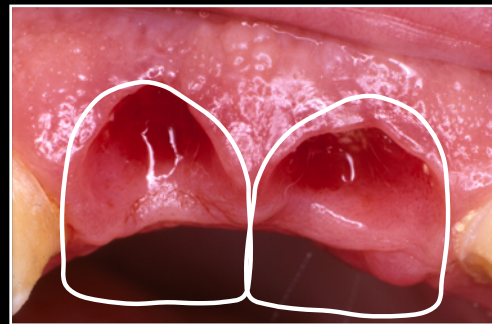
How does it work?

It mimics nature by placing the facsimile of a tooth shape next to another tooth or pontic



Predictable Soft-tissue
Ridge Augmentation and
Ovate Pontic Design:

A Simplified Approach



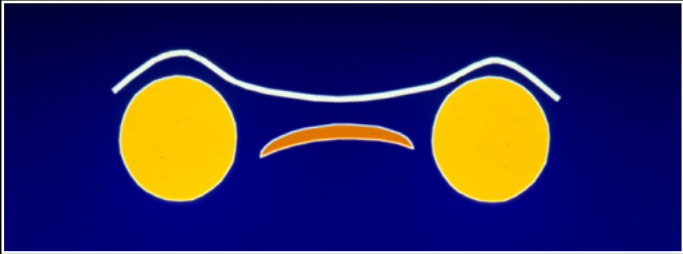
POUCH TECHNIQUE



SURGICAL PHASE

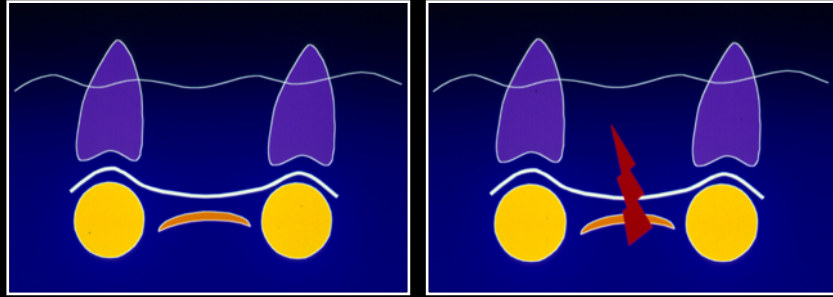
INCISION

RECIPIENT SITE

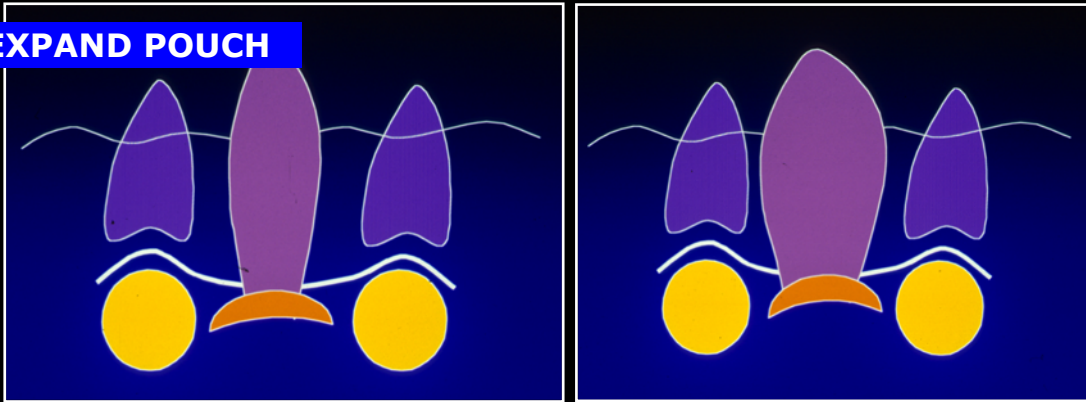


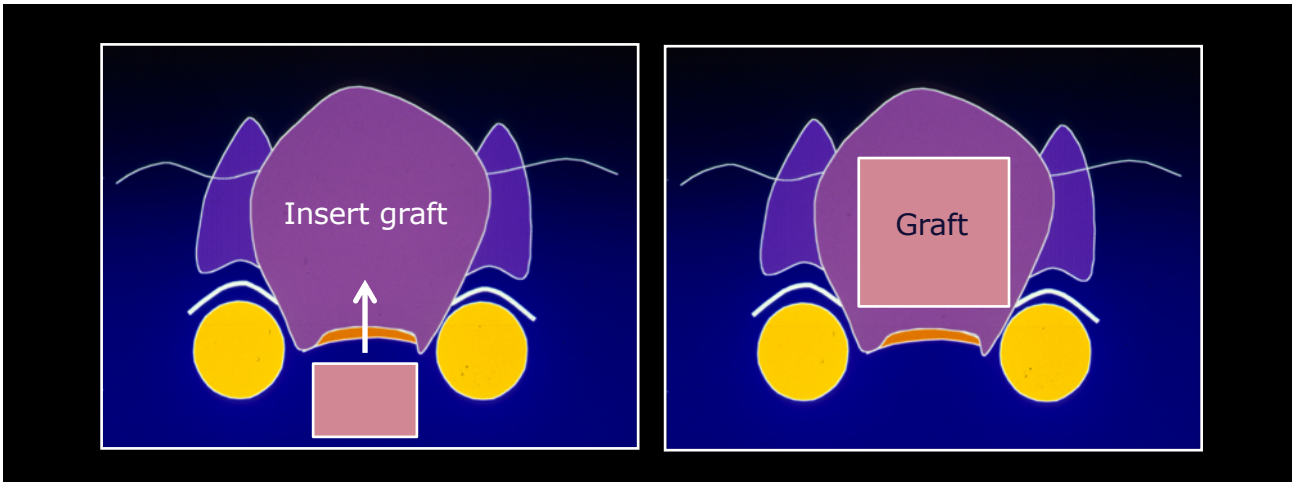
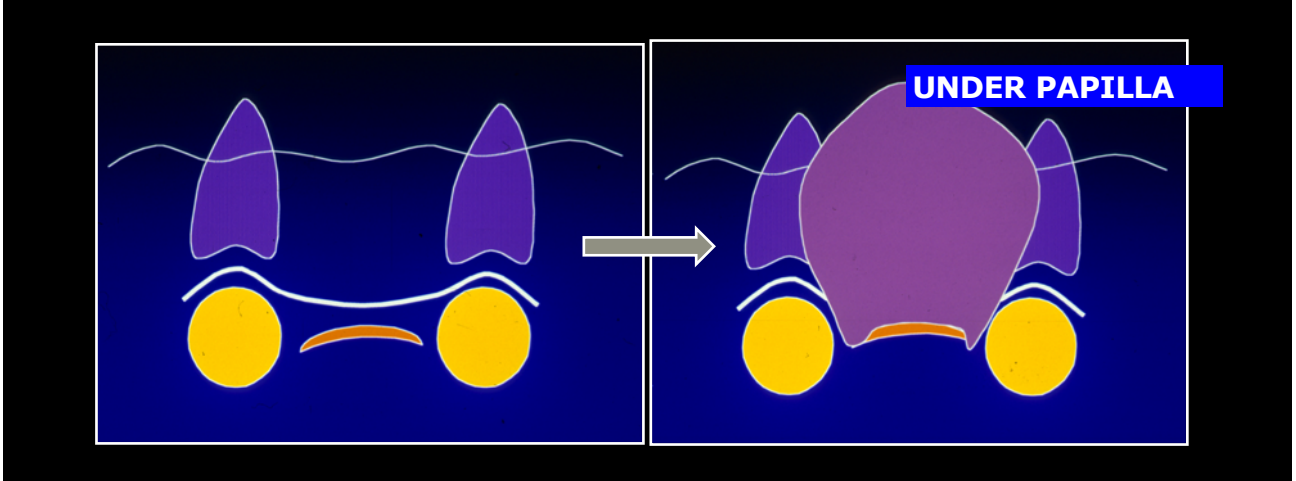
INCISION

- At ridge crest
- Create a pouch



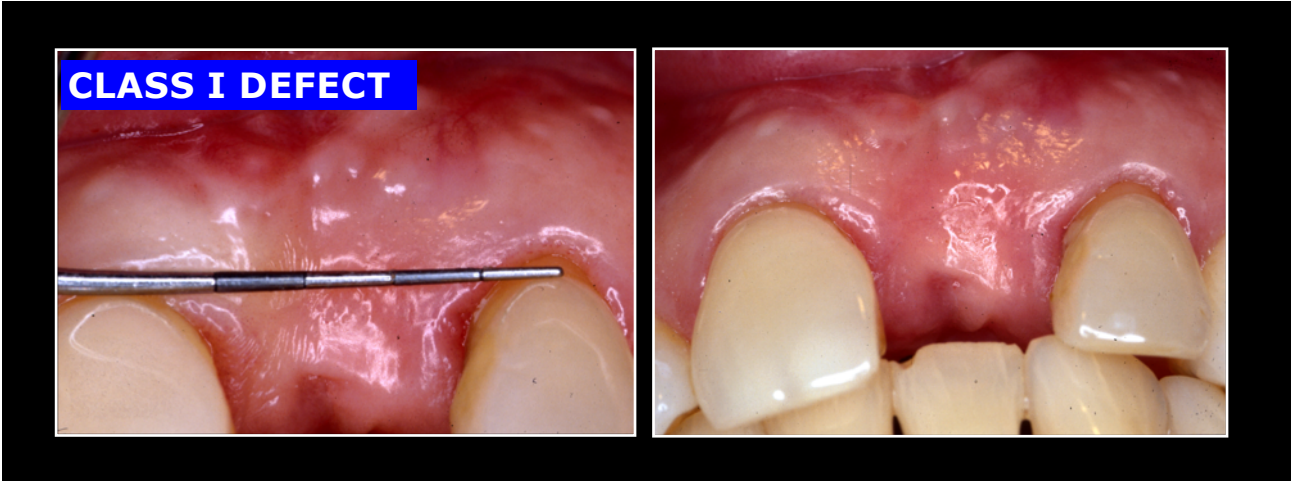
EXPAND POUCH

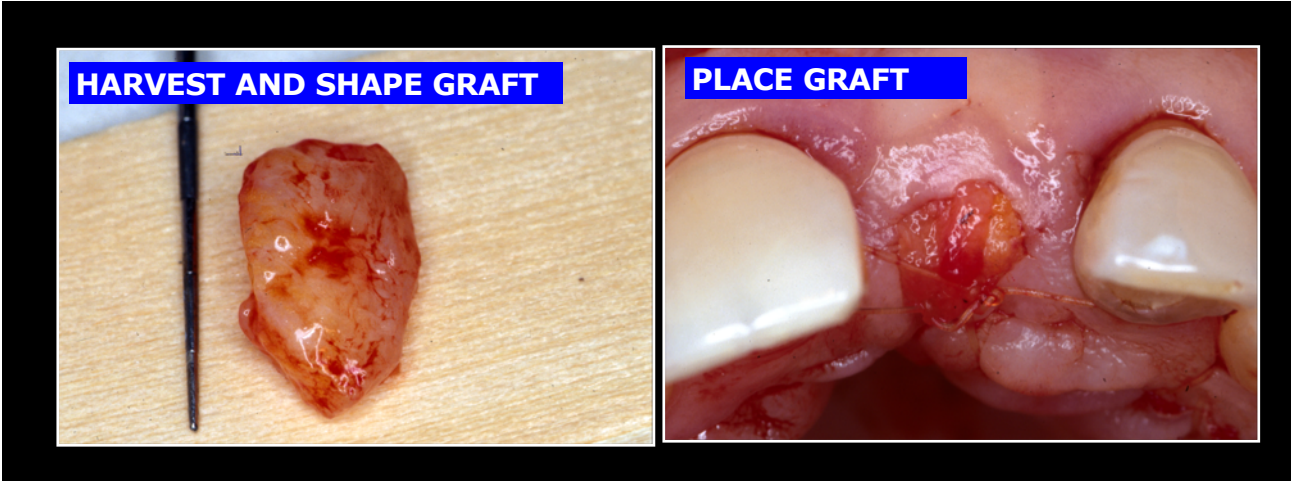
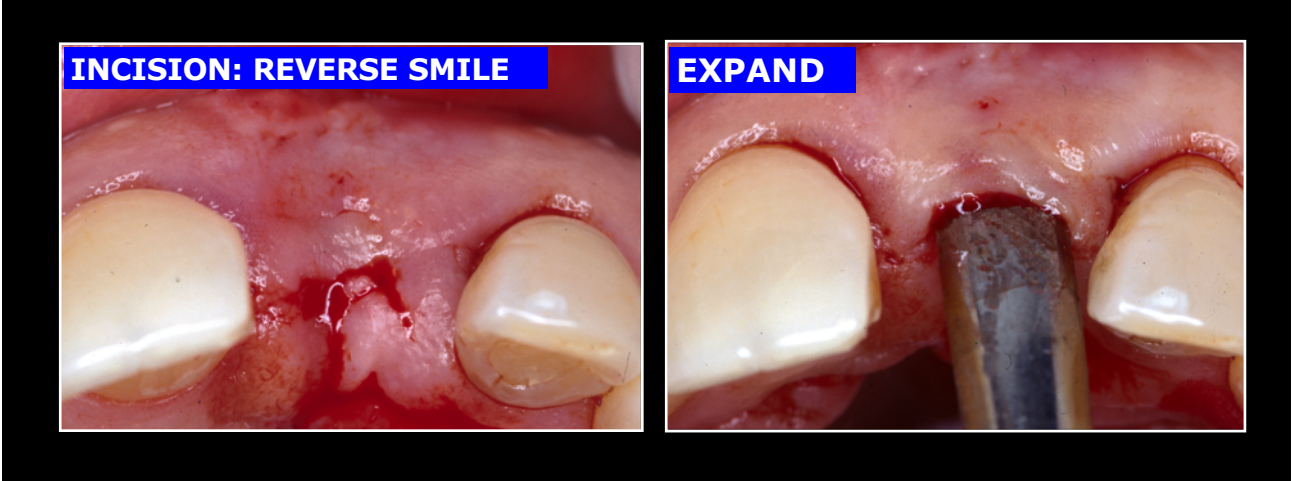


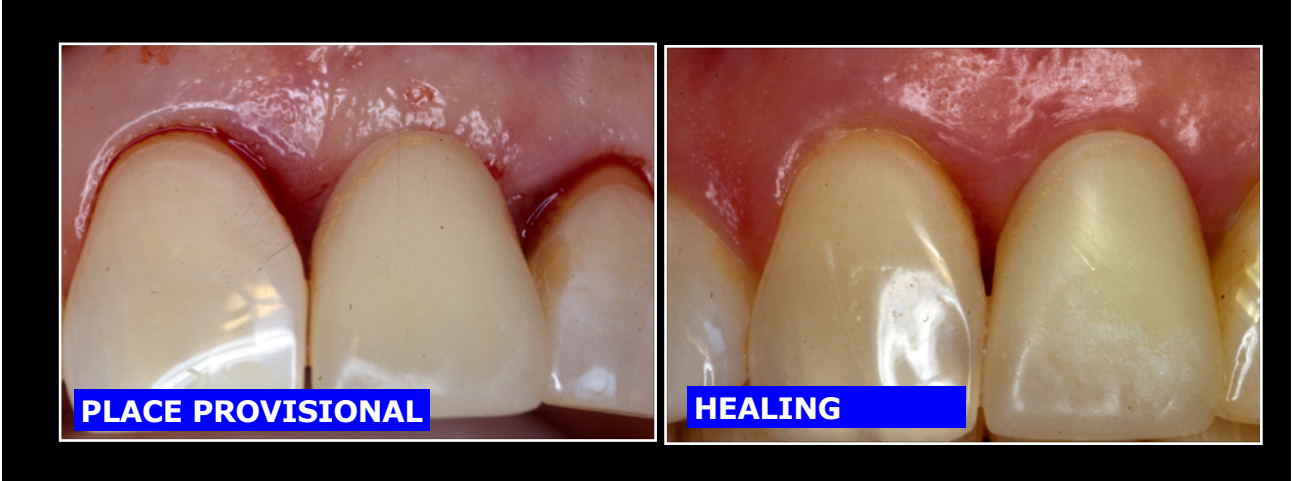


LEFT CENTRAL INCISOR

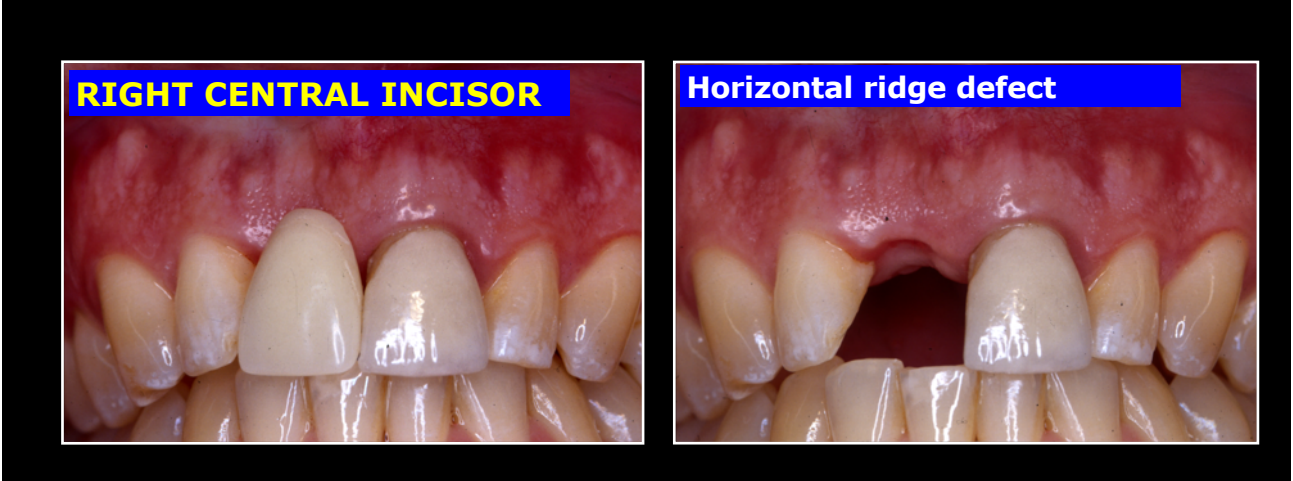


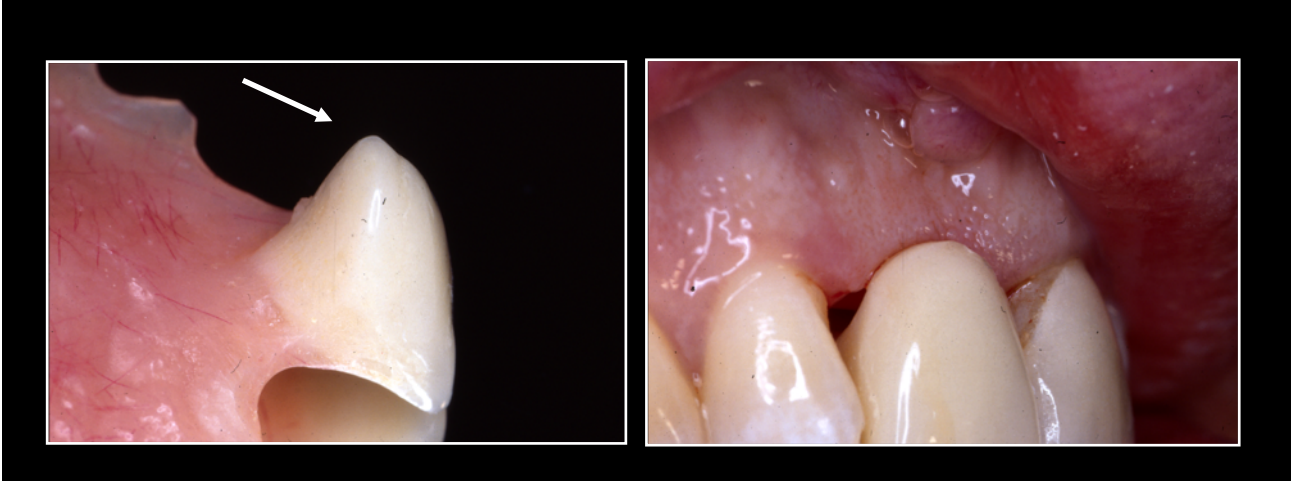






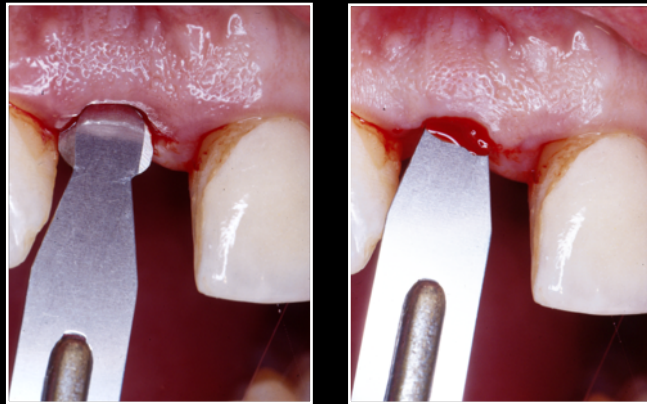






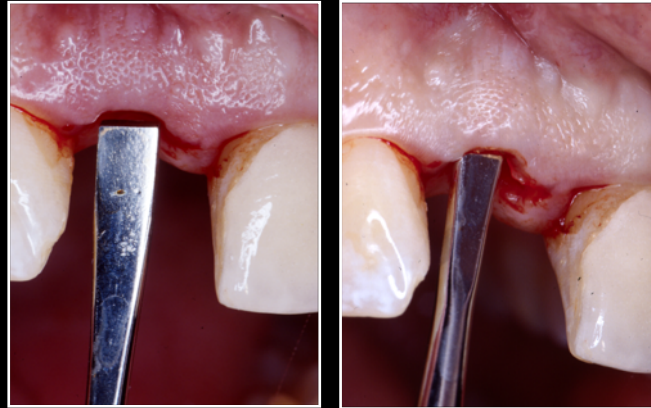
Incision

- Ridge crest
- Reverse smile
- Follow bone



Incision

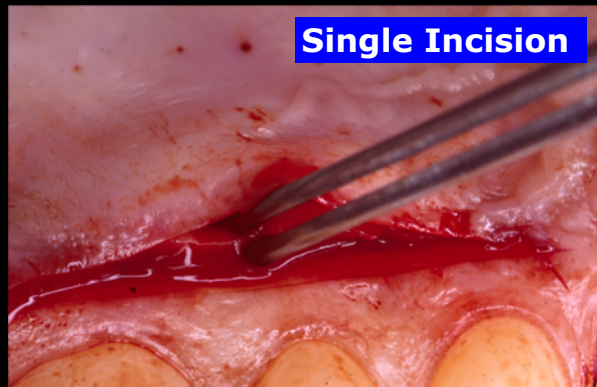
- Create pouch
- Enlarge pouch
- Extend under papilla

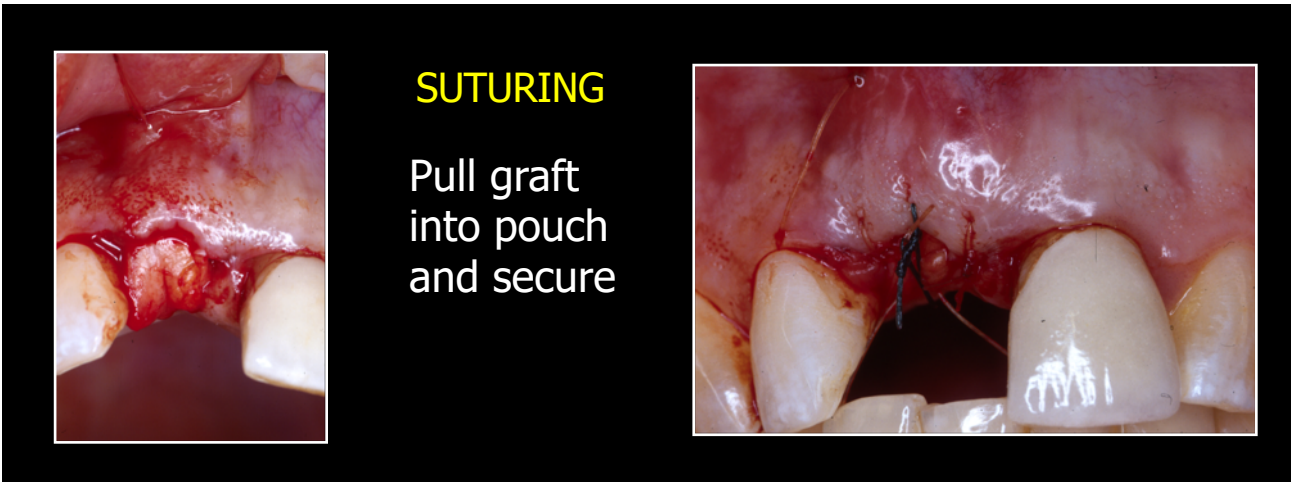
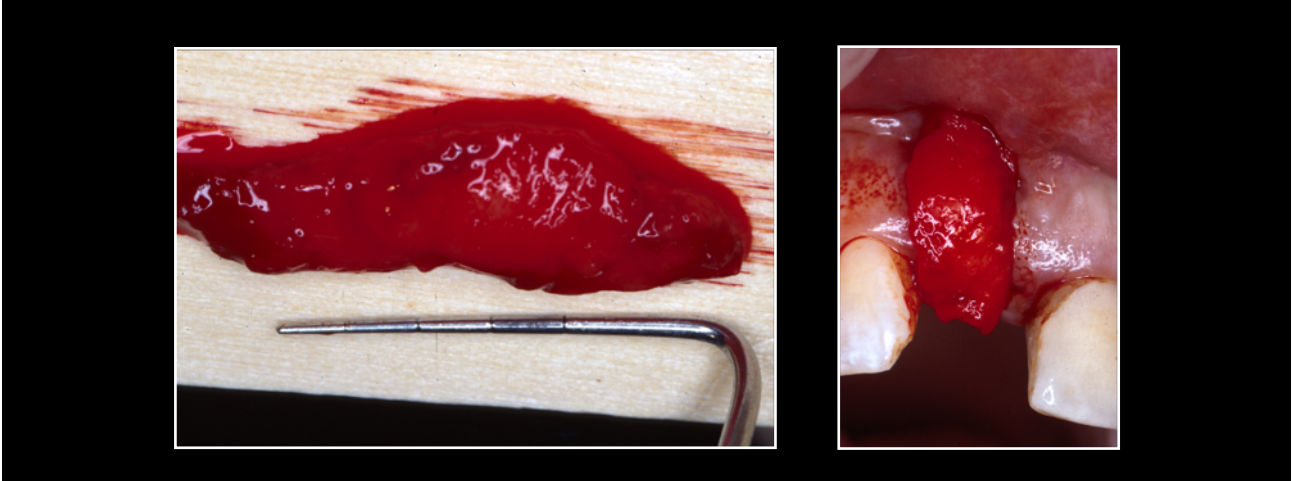


PALATAL DONOR SITE



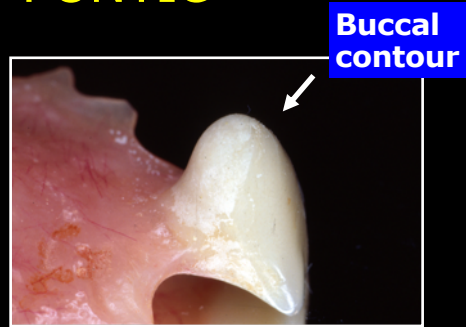
Single Incision

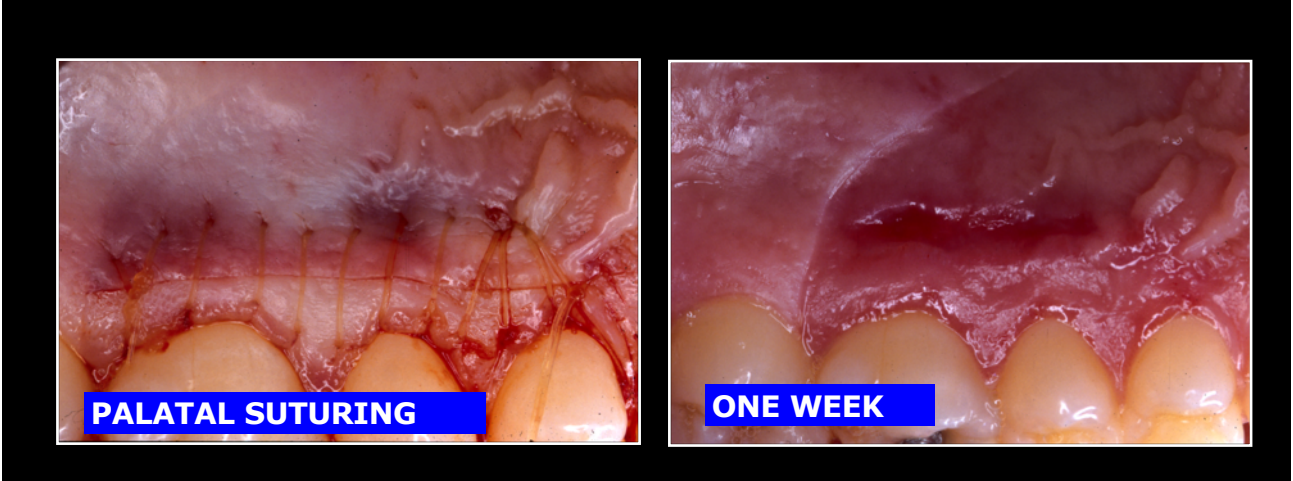




Restorative Phase: PONTIC

- Removable or fixed
- Reshape: eggish
- Support papilla
- Natural emergence
- Contact with ridge
- Light cured resin



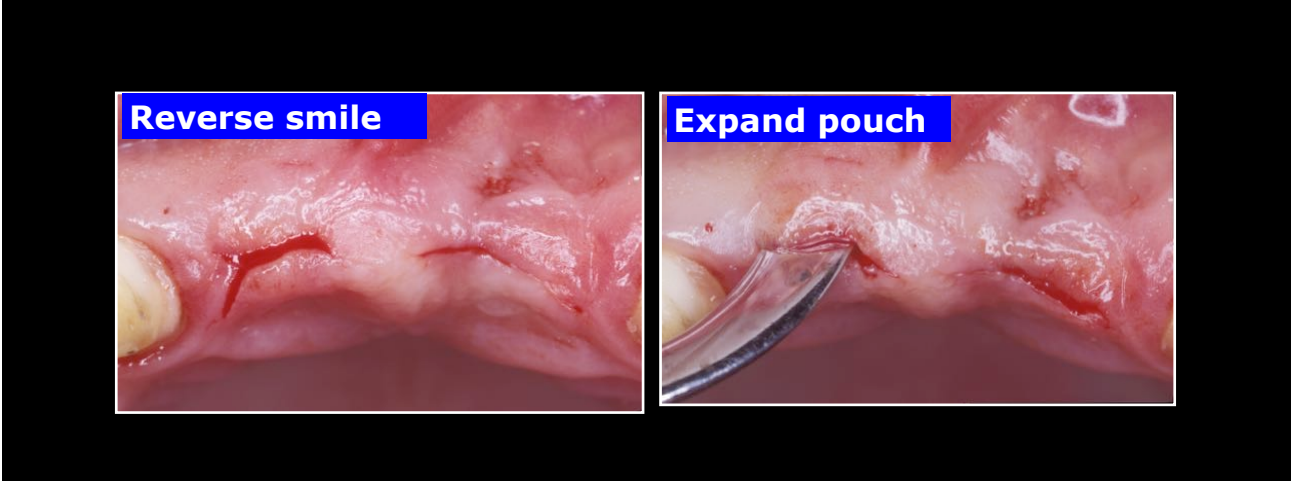
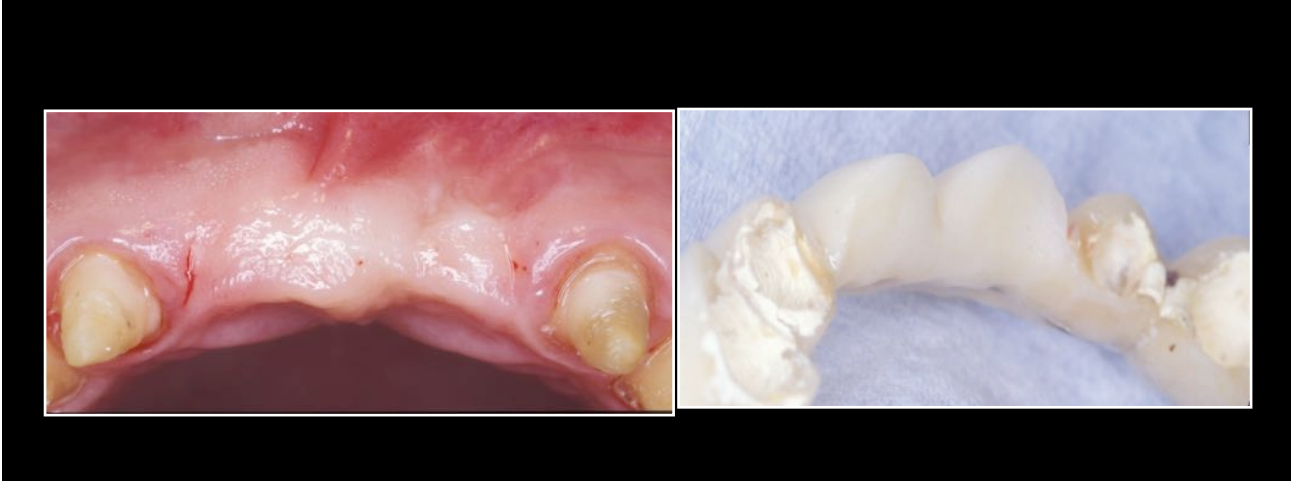


EIGHT YEARS

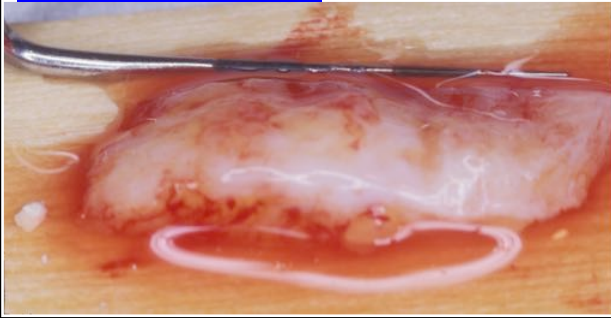


Missing Central Incisors

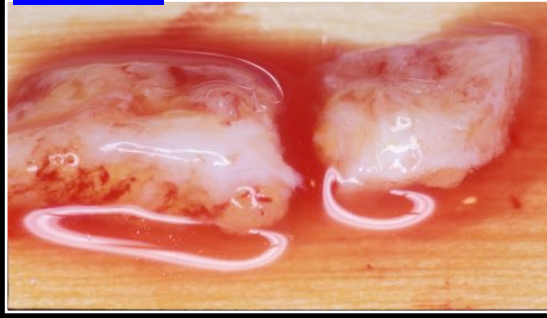




Harvest Graft

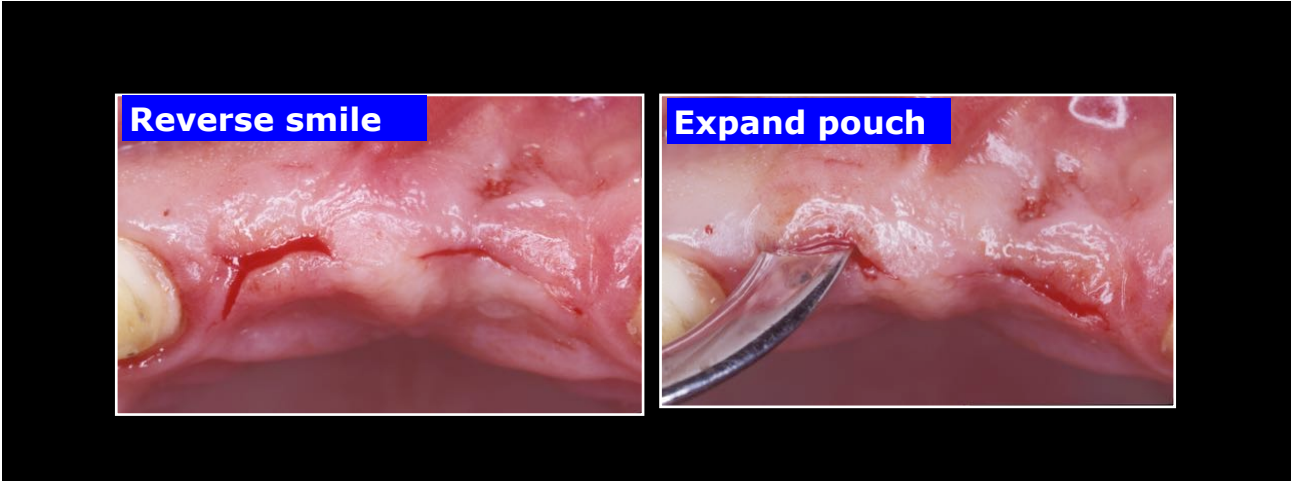
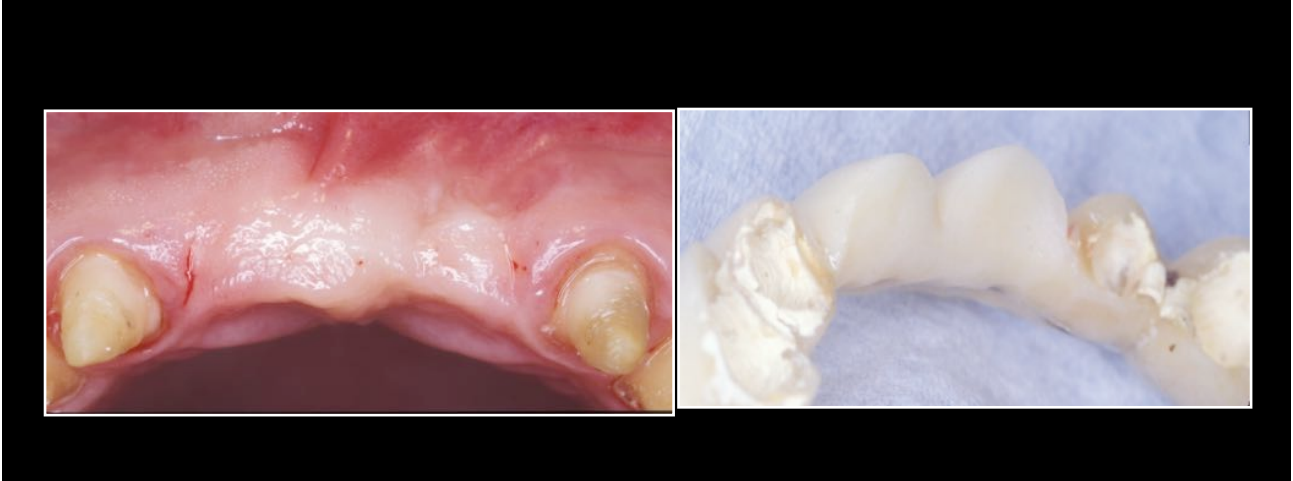


Divide

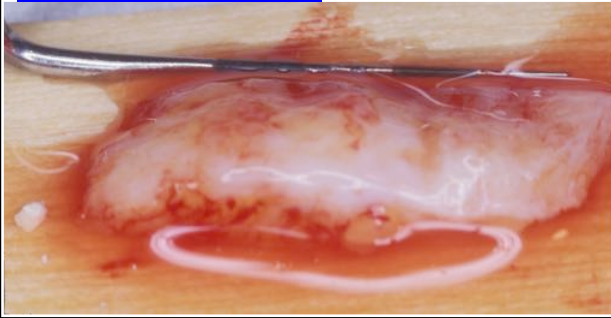


Place grafts in pouches

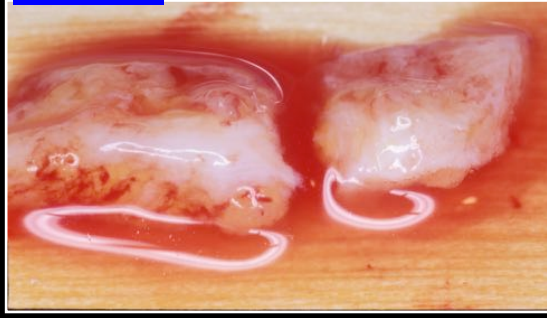




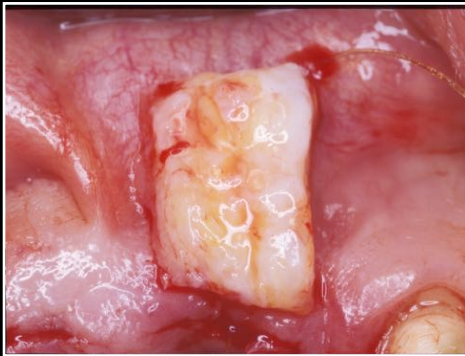
Harvest Graft



Divide



Place grafts in pouches



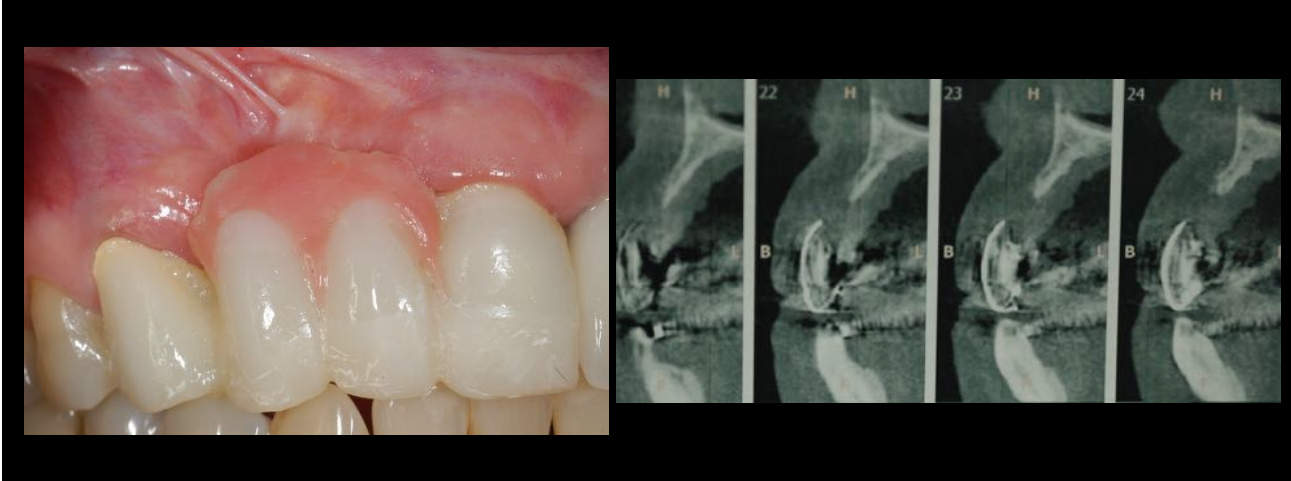


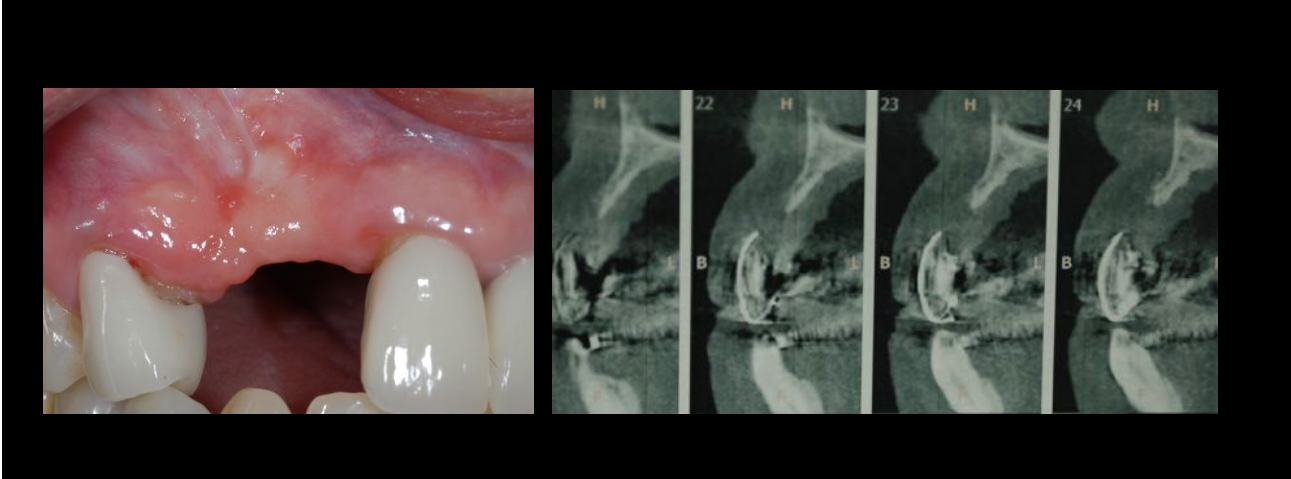


"Nancy"
#7

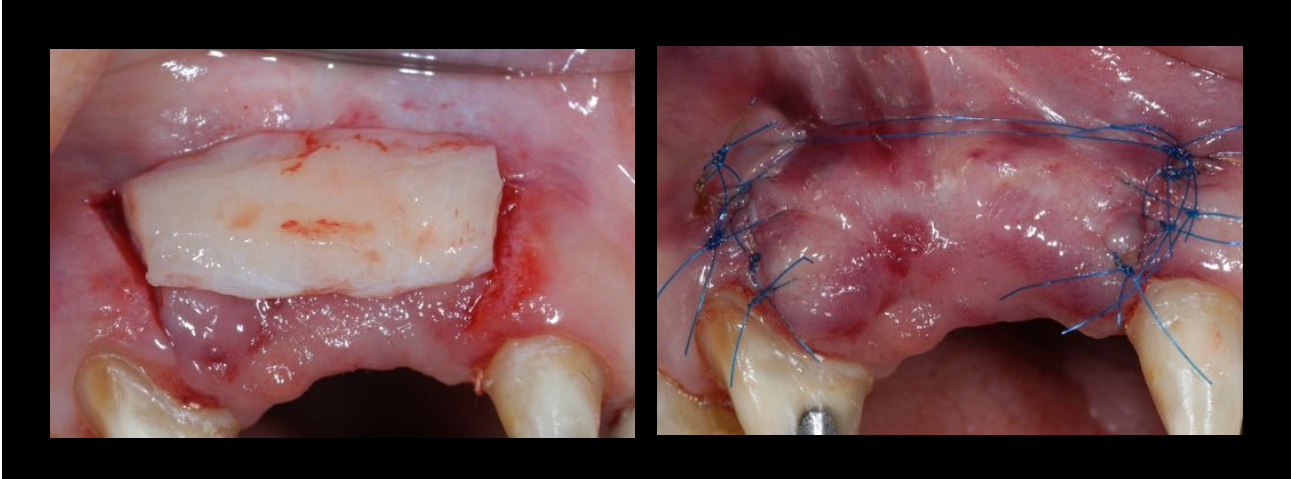
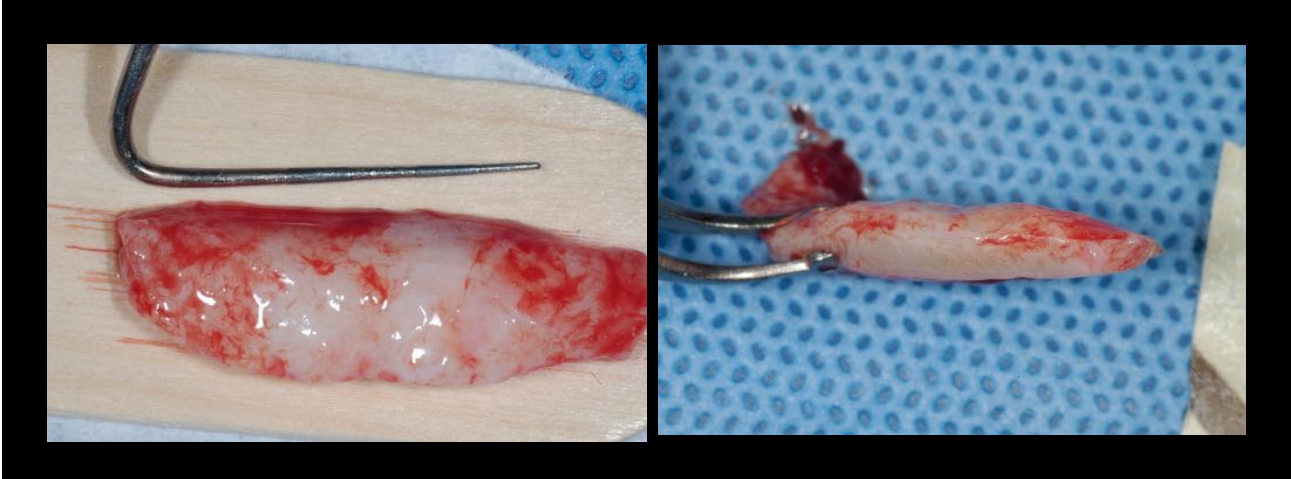
- Pain
- Swelling
- Early 50's
- Healthy

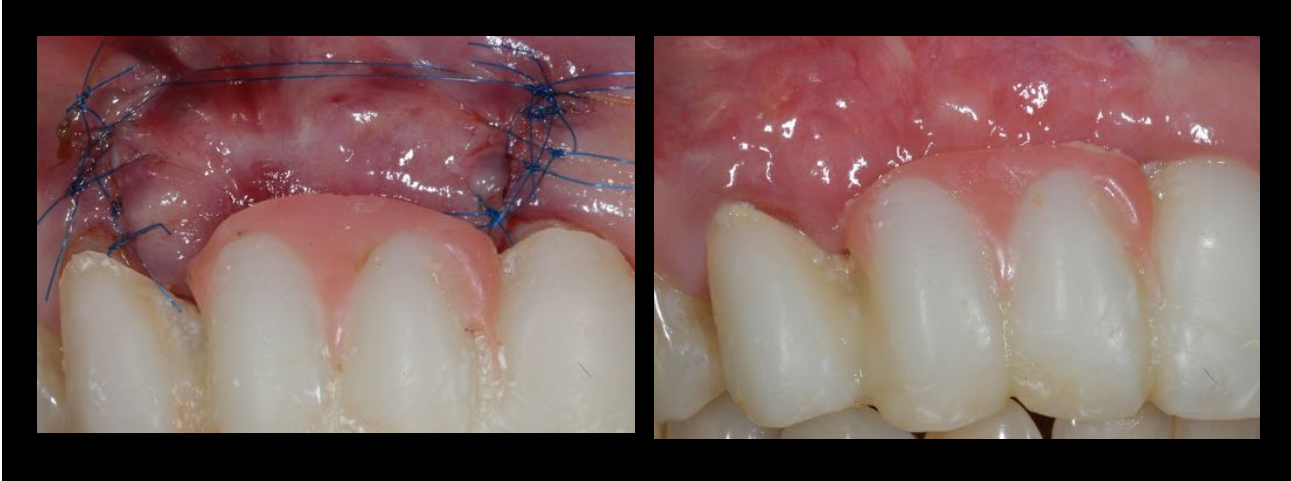
Two periapical radiographs of tooth #7. The left radiograph shows a normal appearance. The right radiograph shows a yellow arrow pointing to a radiolucent area at the apex of the root, indicating a periapical abscess.













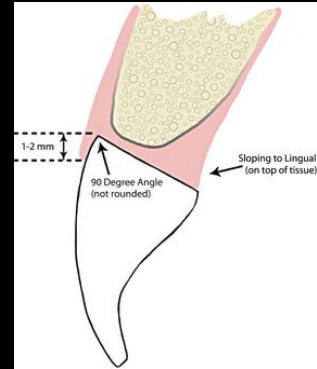
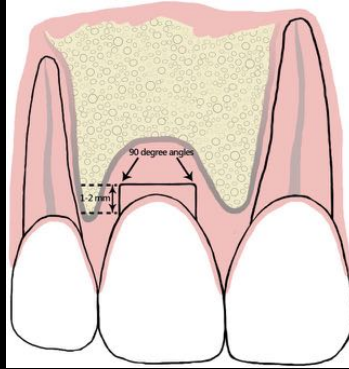


Enhancing Esthetics with a Fixed Prosthesis Utilizing an Innovative Pontic Design and Periodontal Plastic Surgery

ROBERT P. KORMAN, DDS, MAGD

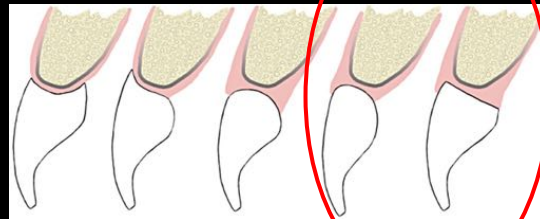
(J Esthet Restor Dent 27:13–28, 2015)

"E-Pontic"



Benefits: "ovate pontic"

- Correct emergence profile
- Fulfill functional requirements
- Greater ease of cleaning
- Effective air/ saliva seal
- Appearance of a free gingival margin and interdental papilla
- Elimination or minimization of the "black triangle"
- May reduce need of ridge augmentation required prior to the final restoration



Surgical Crown Lengthening



Surgical Crown Lengthening: Rationale

- Access for restorative dentistry
- Retention form
- **Esthetics**



Surgical Crown Lengthening

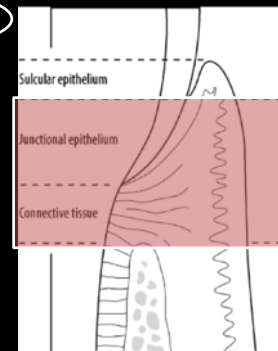
Options:

- Gingivectomy
- Apically positioned flap
- Apically positioned flap with osseous reshaping



~~Biologic Width~~

The dimension of the soft tissue which is attached to the portion of the tooth coronal to the crest of the alveolar bone.



JE=0.97 mm

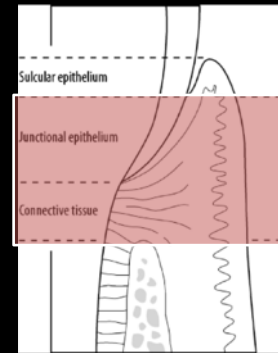
CT=1.07 mm

Total= 2.04 mm

Gargiulo, 1961

Supra-crestal attached tissues

The dimension of the soft tissue which is attached to the portion of the tooth coronal to the crest of the alveolar bone.



JE=0.97 mm

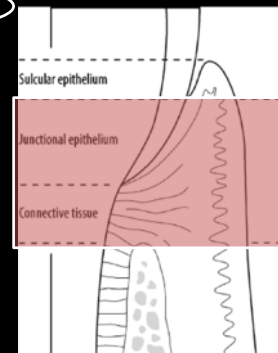
CT=1.07 mm

Total= 2.04 mm

Gargiulo, 1961

Supra-crestal attached tissues

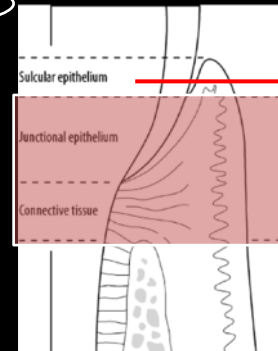
Because the SAT will reform, it is important that the **surgeon and restorative dentist communicate** the location of the final restorative margin to **avoid infringement.**



Danger!

Supra-crestal attached tissues

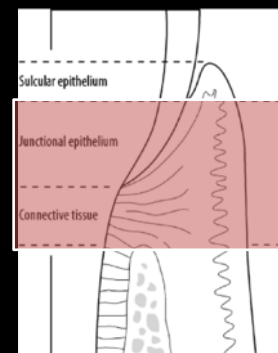
Because the SAT will reform, it is important that the **surgeon and restorative dentist communicate** the location of the final restorative margin to **avoid infringement.**



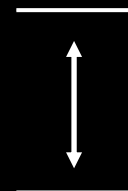
Restorative margin placed **0.5-1.0 mm** into sulcus **≥2.5 mm** from bone crest

Supra-crestal tissues

- Supra crestal tissues will reform to their usual physiologic dimension
- Buccal = 3 mm
- Interproximal = 4.5 mm
- Buccal scallop = 4.5 mm
- Tissue maturation = 6-12 months



SCT



Esthetic Crown Lengthening: Rationale

- Teeth too short
- Excessive gingival display
- Both



Basic Rules of Crown Lengthening for Crown Restoration

Probe and sound under local anesthesia to determine the location of the bone crest and the distance between the CEJ and the bone crest

Determine the desired length of the proposed crown

Determine the final position of the incisal edge

Add 3 mm to the proposed crown length to determine the new position of the bone rest

Basic Rules of Crown Lengthening for Crown Restoration

Probe and sound under local anesthesia to determine the location of the bone crest and the distance between the CEJ and the bone crest

Determine the desired length of the proposed crown

Determine the final position of the incisal edge

Add 3 mm to the proposed crown length to determine the new position of the bone rest

Basic Rules of Crown Lengthening for Crown Restoration

Probe and sound under local anesthesia to determine the location of the bone crest and the distance between the CEJ and the bone crest

Determine the desired length of the proposed crown

Determine the final position of the incisal edge

Add 3 mm to the proposed crown length to determine the new position of the bone rest

Basic Rules of Crown Lengthening for Crown Restoration

Probe and sound under local anesthesia to determine the location of the bone crest and the distance between the CEJ and the bone crest

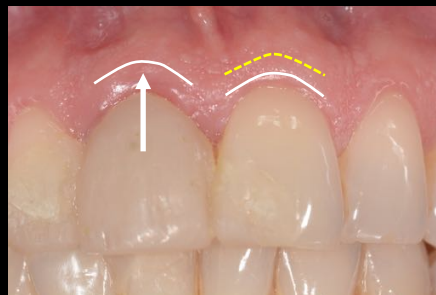
Determine the desired length of the proposed crown

Determine the final position of the incisal edge

Add 3 mm to the proposed crown length to determine the new position of the bone rest

Basic Rules of Crown Lengthening for Tooth Not to be Restored

Probe and sound under local anesthesia to determine the location of the bone crest and the distance between the CEJ and the bone crest



May need to establish a new bone level 2-3 mm from the CEJ

Hyperplasia



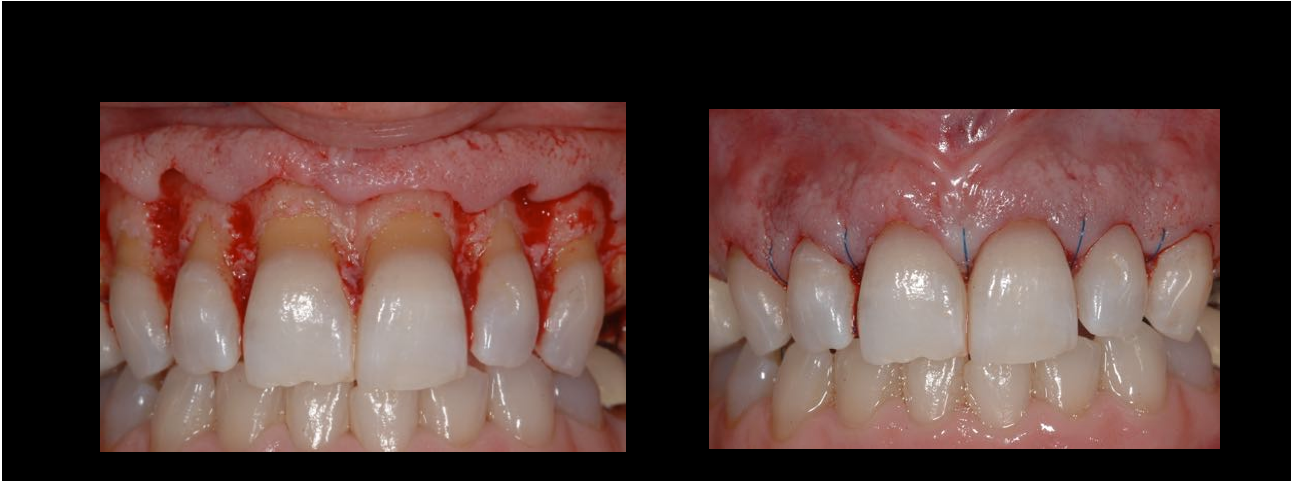






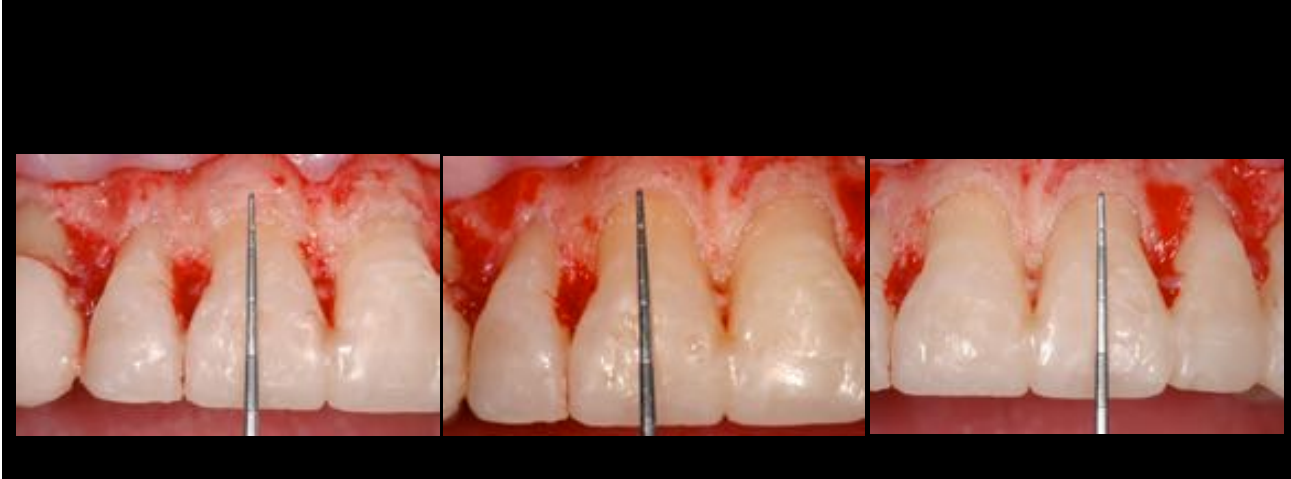






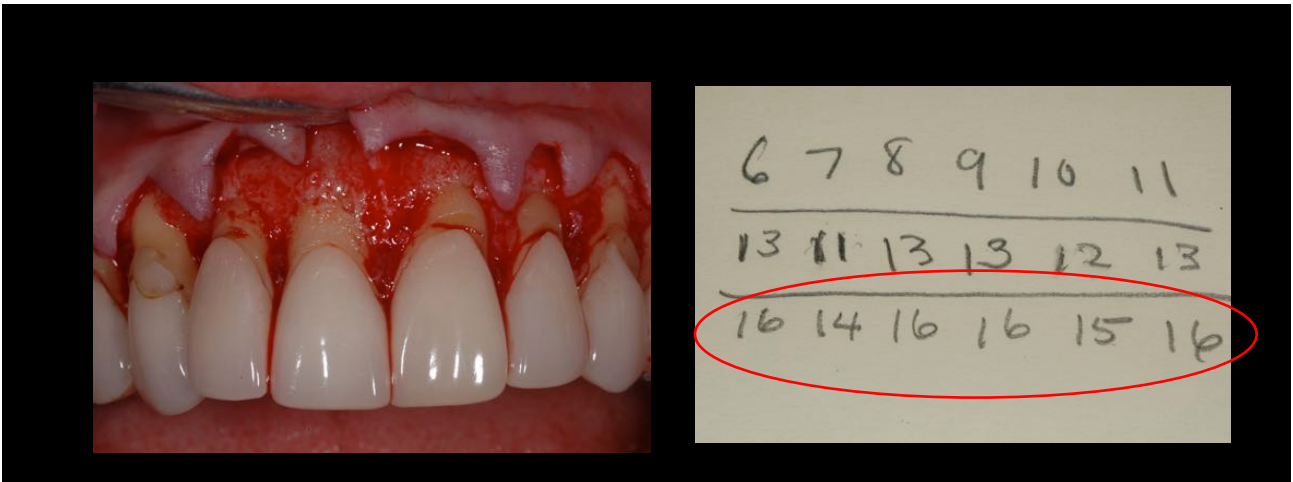


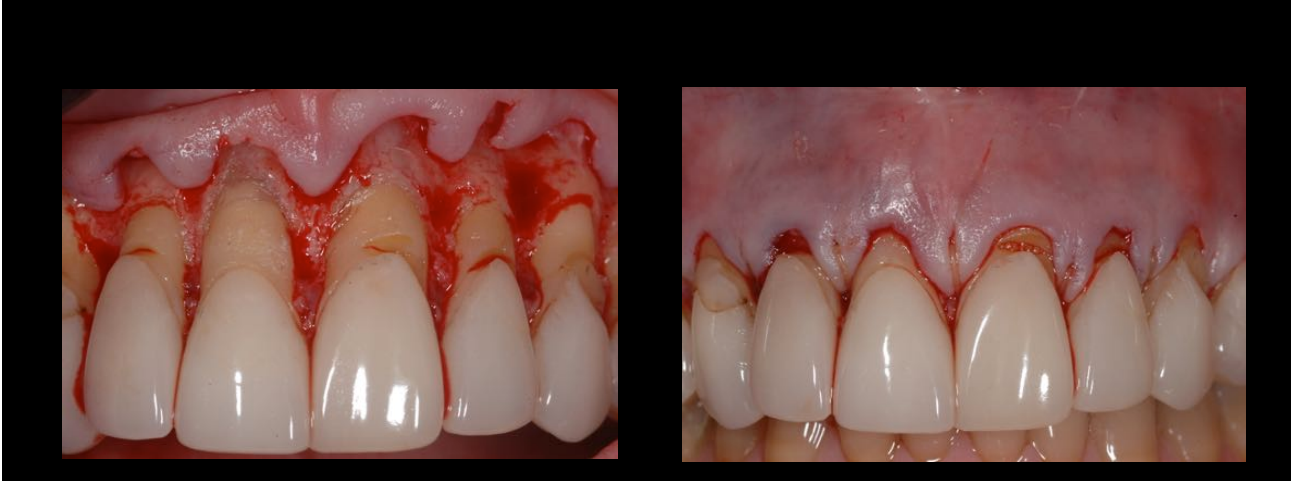


















Natalie 2017



Natalie 2003

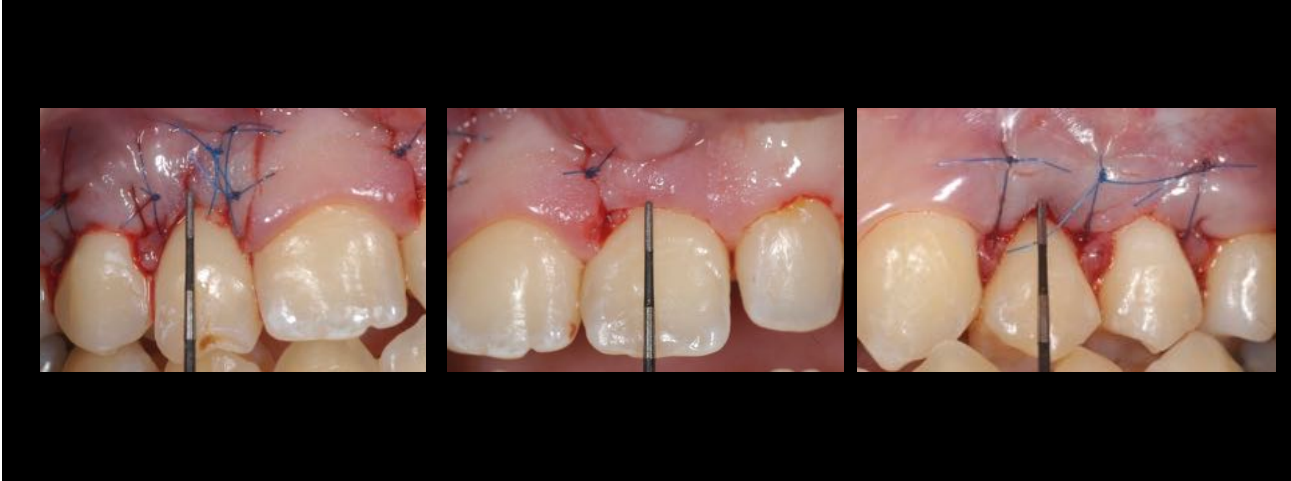


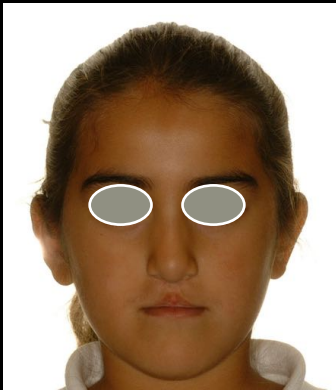
Natalie 2003











2003



2017

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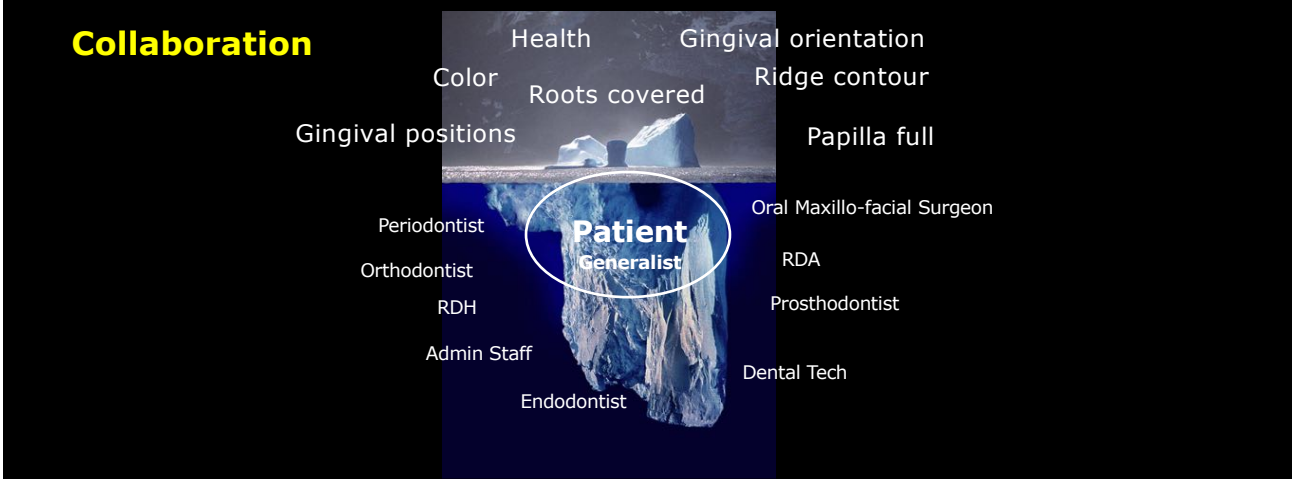
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GINGIVAL SCAFFOLD



"Periodontal Plastic Surgical Procedures to Enhance Esthetics"





Thank you!