NEW YORK UNIVERSITY

- Co-Director AIE
- MINEC Knight
- Board Member Digital Dentistry Society USA
- Director of digital workflow Chrome Guided Surgery
- Diplomate IADI, JADEE, ICOI
- Private Practice Brooklyn, NY
- KOL Megagen, IDS, Henry Schein, 3disc,
- 3 shape, Carestream, Piezosurgery

Soft Tissue Management

Key Factors to Avoid Perimplantitis

AIE

Digital Dentistry Society
United States

Soft tissue management

Implantology

Soft tissue management

Implantologie

Treatment with EDTA

FGG
(free gingival graft)

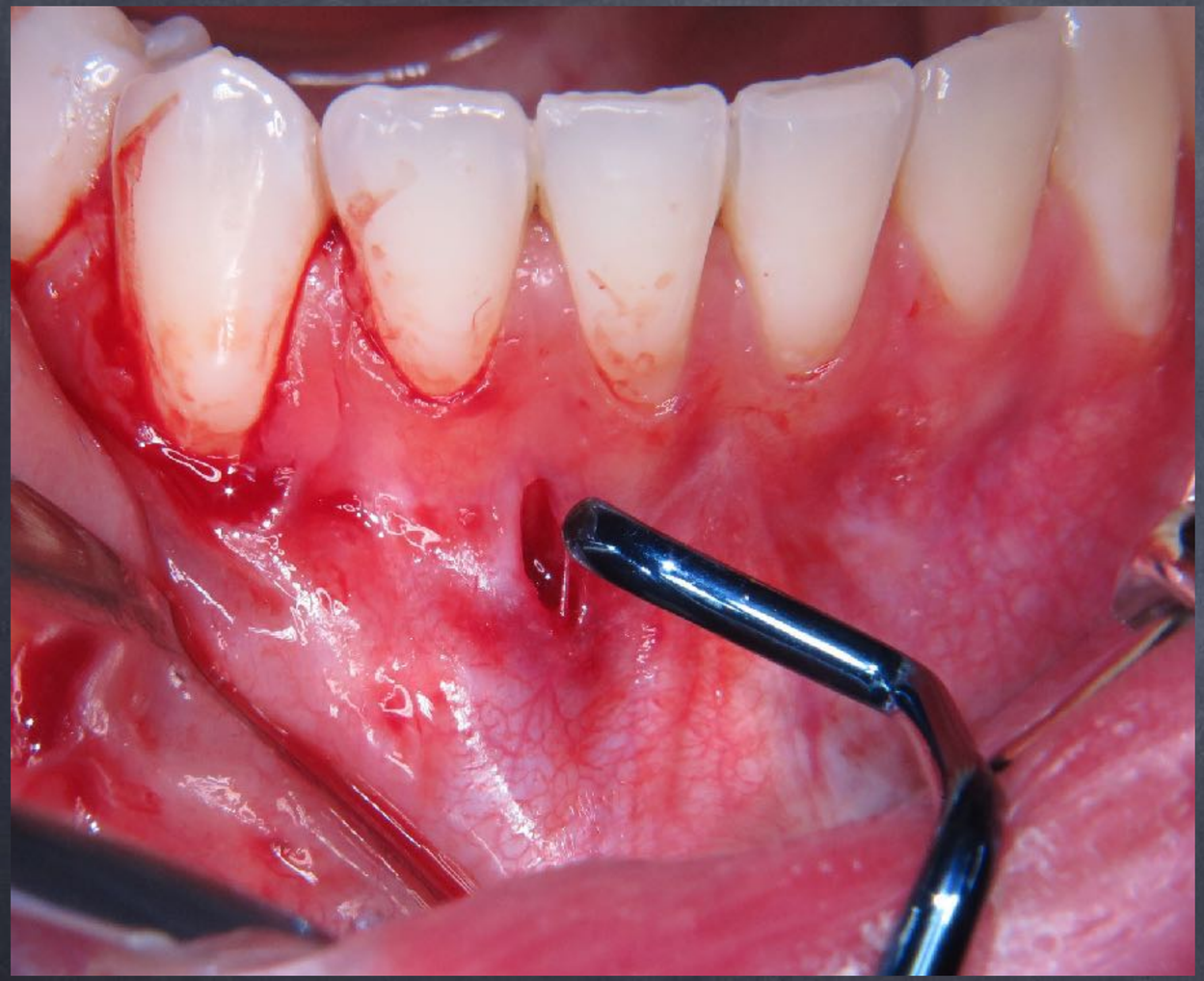
Pre Op

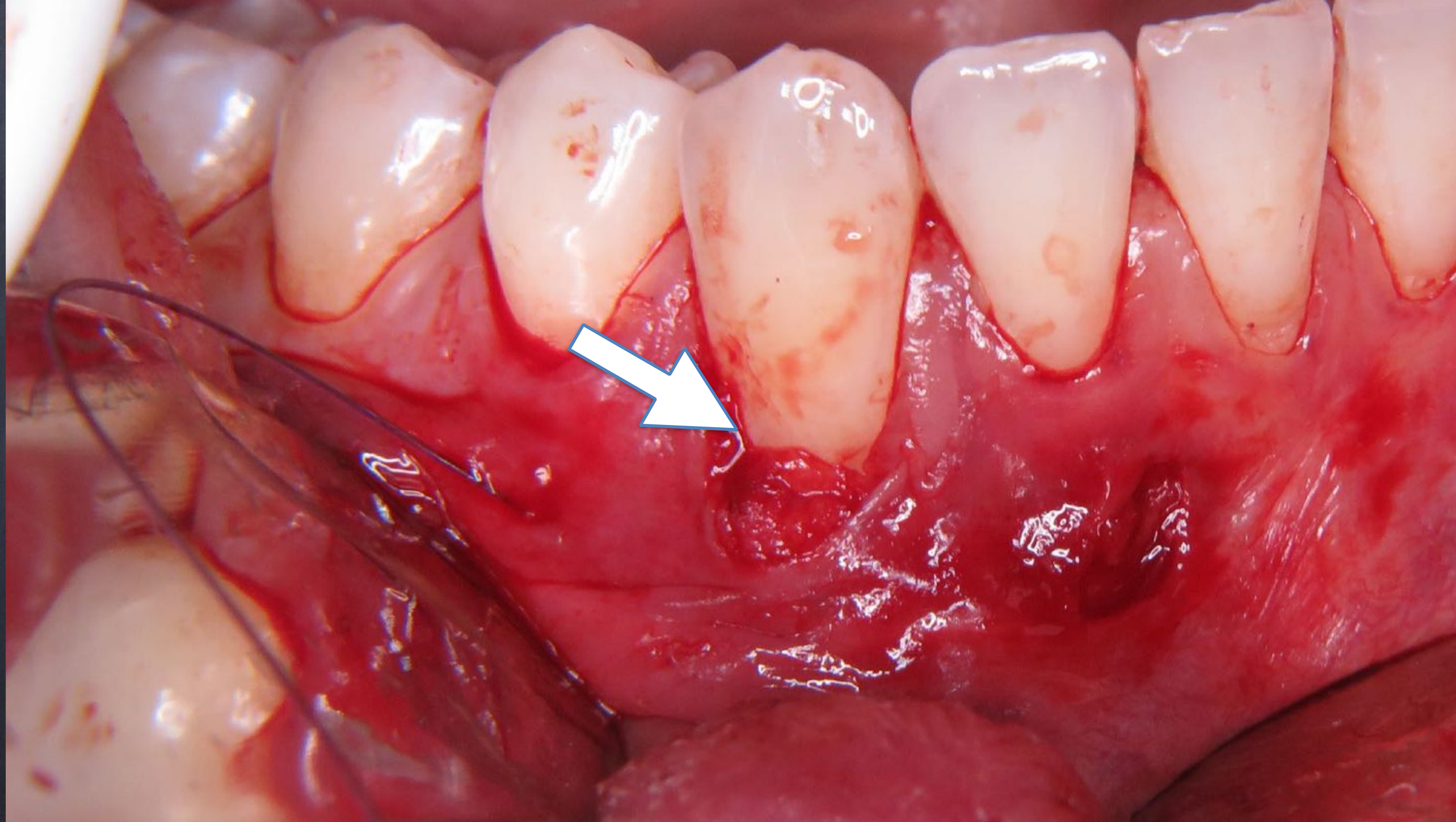
2 YR Post Op


CTG - VISTA

Vestibular Inciosion

Subperiosteol Tunneling Approach

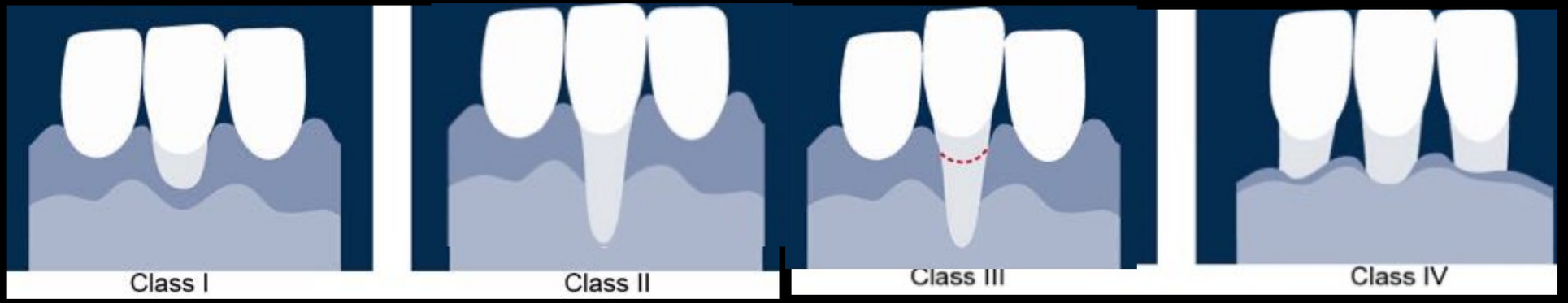





2 week PO

Before

1 YR PO

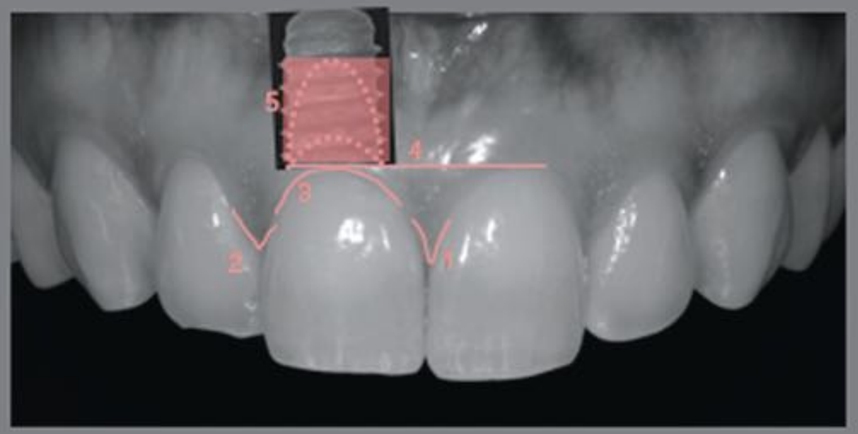


CLASSIFICATION OF MARGINAL TISSUE RECESSION.*

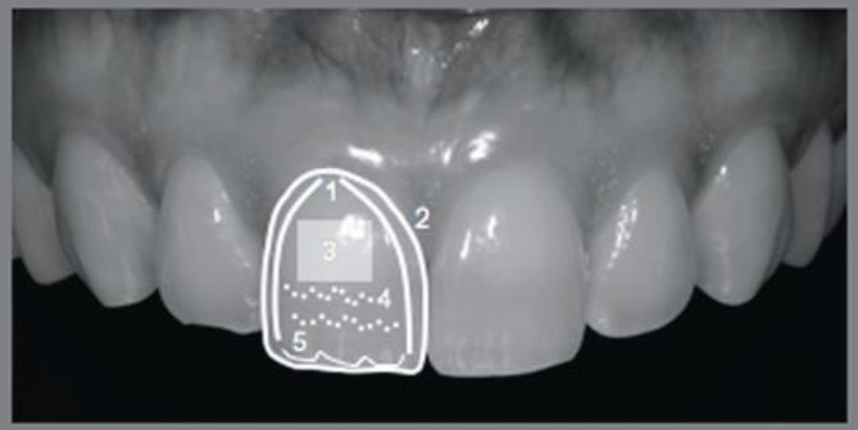
CLASSIFICATION	CRITERIA
Class I	Marginal tissue recession that does not extend to the mucogingival junction
Class II	Marginal tissue recession that extends to or beyond the mucogingival junction, with no periodontal attachment loss (bone or soft tissue) in the interdental area
Class III	Marginal tissue recession that extends to or beyond the mucogingival junction, with periodontal attachment loss in the interdental area or malpositioning of teeth
Class IV	Marginal tissue recession that extends to or beyond the mucogingival junction, with severe bone or soft-tissue loss in the interdental area and/or severe malpositioning of teeth

* Source: Miller.[40]

PES



WES



1: Mesial Papilla	0	1	2
2: Distal Papilla	0	1	2
3: Curvature of Facial Mucosa	0	1	2
4: Level of Facial Mucosa	0	1	2
5: Root Convexity/Soft Tissue Color and Texture	0	1	2

Maximum Score: 10

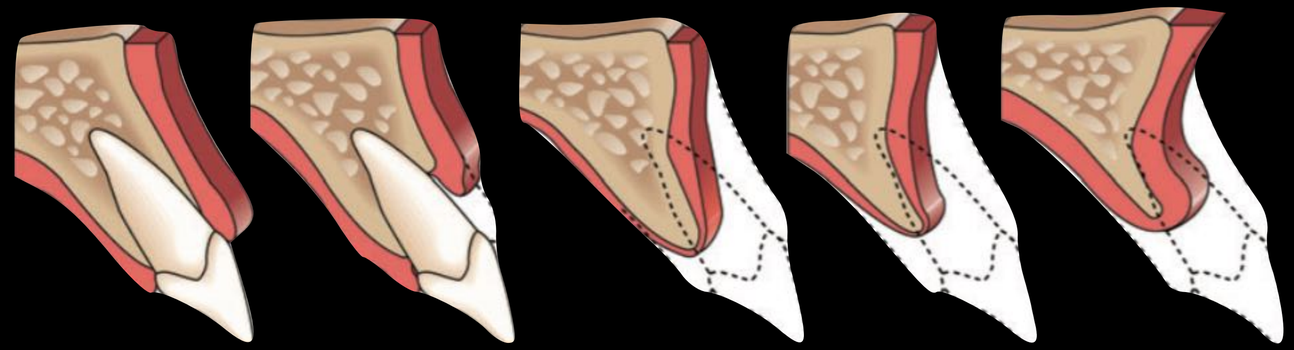
Variables	0	1	2
Papilla - M	Missing	Incomplete	Complete
Papilla - D	Missing	Incomplete	Complete
Tissue contours	Unnatural	Virtually natural	Natural
Gingival level	>2 mm	1-2 mm	< 1mm
Alveolar process	Clearly resorbed	Slightly resorbed	No difference
Coloring	Clear difference	Slight difference	No difference
Texture	Clear difference	Slight difference	No difference

Maximum Score: 10

WHAT ABOUT DENTAL IMPLANTS?

Combinations of the different classes of vertical and horizontal dimensions of tissue loss	
Vertical loss	Horizontal loss
Class I	Class A
Class II	Class B
Class III	Class C
Class IV	Class D

Palacci, Nowzari Periodontology, Vol 47,2008



5 4 3 2 1

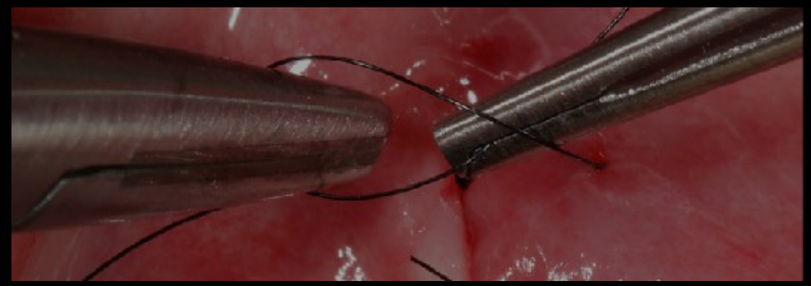
Determined by remaining walls

max 5 min 1

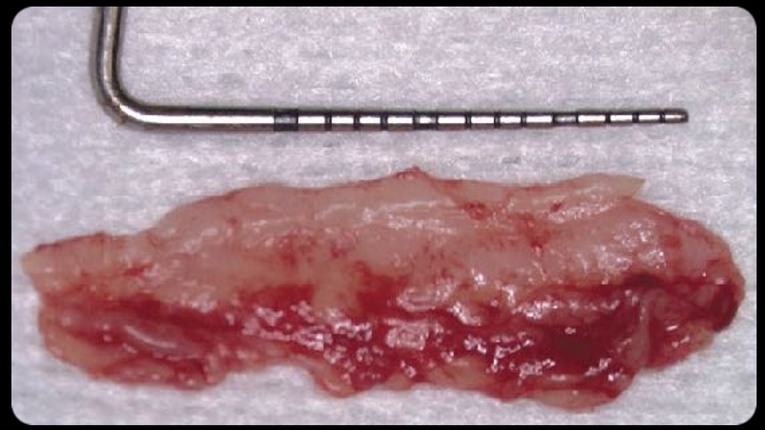
WHAT ABOUT DENTAL IMPLANTS?

Implantation – Incision design

Second stage – Enhance Quality



Improvement – Improve Quantity



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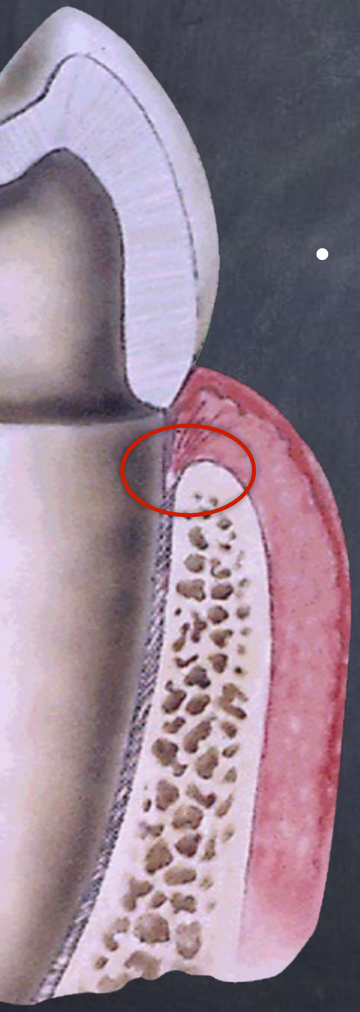
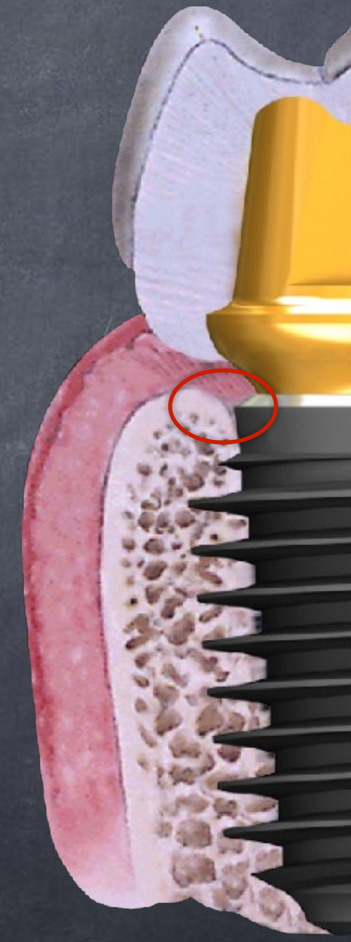
NATURAL TEETH VS. IMPLANTS

Biological Comparisons

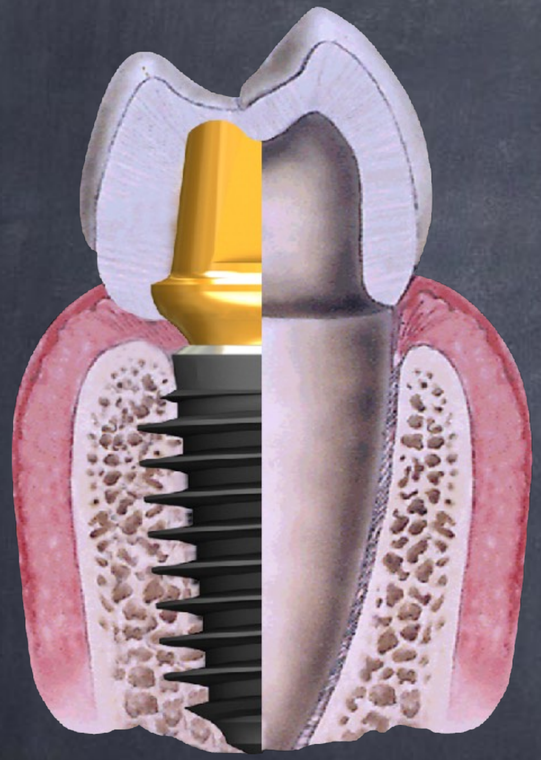


- Around teeth, blood supply support originates from the periodontal ligament to the connective tissue ; from the alveolar process to the PDL and then to the CT ; and from the alveolar process to the CT

- Vascular supply **very few vessels** were found in the connective tissue near the transmucosal portion of the implant. This **limited blood supply** makes the peri-implant tissues less resilient to both mechanical and microbiological insults.



IMPLANTS & INFLAMMATION

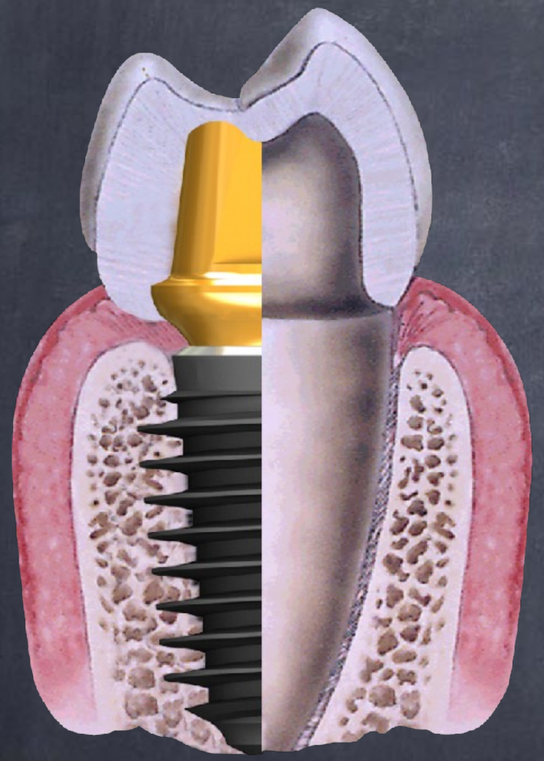


- **Salvi et al. COIR 2011**
- Human subjects, teeth vs. implants. 3 weeks plaque accumulation followed by 3 weeks of optimal plaque control.
- PI, GI, GCF samples analyzed for MMP-8 and IL-1B
- Peri-implant tissues respond to experimental plaque accumulation with
- a greater inflammatory response, and require longer healing periods for complete resolution.
- Although both implants and teeth may appear clinically similar, the

inflammatory processes occurring within the affected tissue may be markedly different.

THE SIGNIFICANCE OF KERATINIZED MUCOSA ON IMPLANT HEALTH: A SYSTEMATIC REVIEW

Lin GH et al. J Periodontal. 2013 Mar 1.



- Aims: This systematic review and meta- analyses aimed to investigate the effect of keratinized mucosa on various peri-implant health related parameters.
- Material and Methods: Human cross-sectional or longitudinal studies with data on relationship between the amount of KM around the dental implants and various peri-implant parameters, with a follow-up period of at least 6 months were included.
- Results: Eleven studies were included, all favoring implants with wide KM.
- Conclusions: Based on current available evidence, a lack of adequate KM around endosseous dental implants is associated with more plaque accumulation, tissue inflammation, mucosal recession as well as loss of attachment.

Inadequate Kertinized tissue

SIGNIFICANCE OF Keritinzed Gingiva

EXPERIMENTAL & OBSERVATIONAL STUDIES

- Chung et al., 2006: Inadequate Keritinzed Gingiva was associated with higher Plaque Index & Gingival Index.
- Crespi et al., 2010: Reduced Keritinzed Gingiva width was associated with increased Plaque Index, Gingival Index, & Recession.
- Kehl et al., 2011: Reduced Keritinzed Gingiva width associated with increased Gingival Index & buccal bone loss.
- Greenstein & Cavalalro, 2011: Implant survival, Gingival Index, Periodontal Probing Depths, Recession, and bone loss worse in the absence of Keritinzed Gingiva.

Ideal regeneration?

Influence of the 3-D Bone-to-Implant Relationship on Esthetics

contact with the oral environment, the distance between an implant and adjacent teeth, as well as the distance between two implants, is as important as the bone volume on the buccal side of the implant head and in the papillary area, especially for the long-term result. This article discusses the 3-D bone-to-implant relationship and its influence on soft tissue esthetics around implants. (Int J Periodontics Restorative Dent 2005;25:113–119.)

*Private Practice, Zollikon Zurich, Switzerland.
**Private Practice, Milan, Italy

Correspondence to: Dr Ueli Grunder, Dufourstrasse 7a, Zollikon-Zürich 8702, Switzerland.

gival margin of the crown. What is more difficult to define is the ideal hard and soft tissue volume around the implant head that can guarantee the presence of an interproximal papilla and an esthetically stable mucosal margin over time.

The natural thickness of the connective tissue overlying the bone around implants (buccal side) is within a narrow range between 2.8 and 3.8 mm.[1–5] The height of the interproximal soft tissues between natural teeth, as well as between a natural tooth and an implant, ranges from 3.5 to 5.0 mm.[6–9] The soft tissue dimension between implants is not known from the scientific point of view, but it seems to be similar.

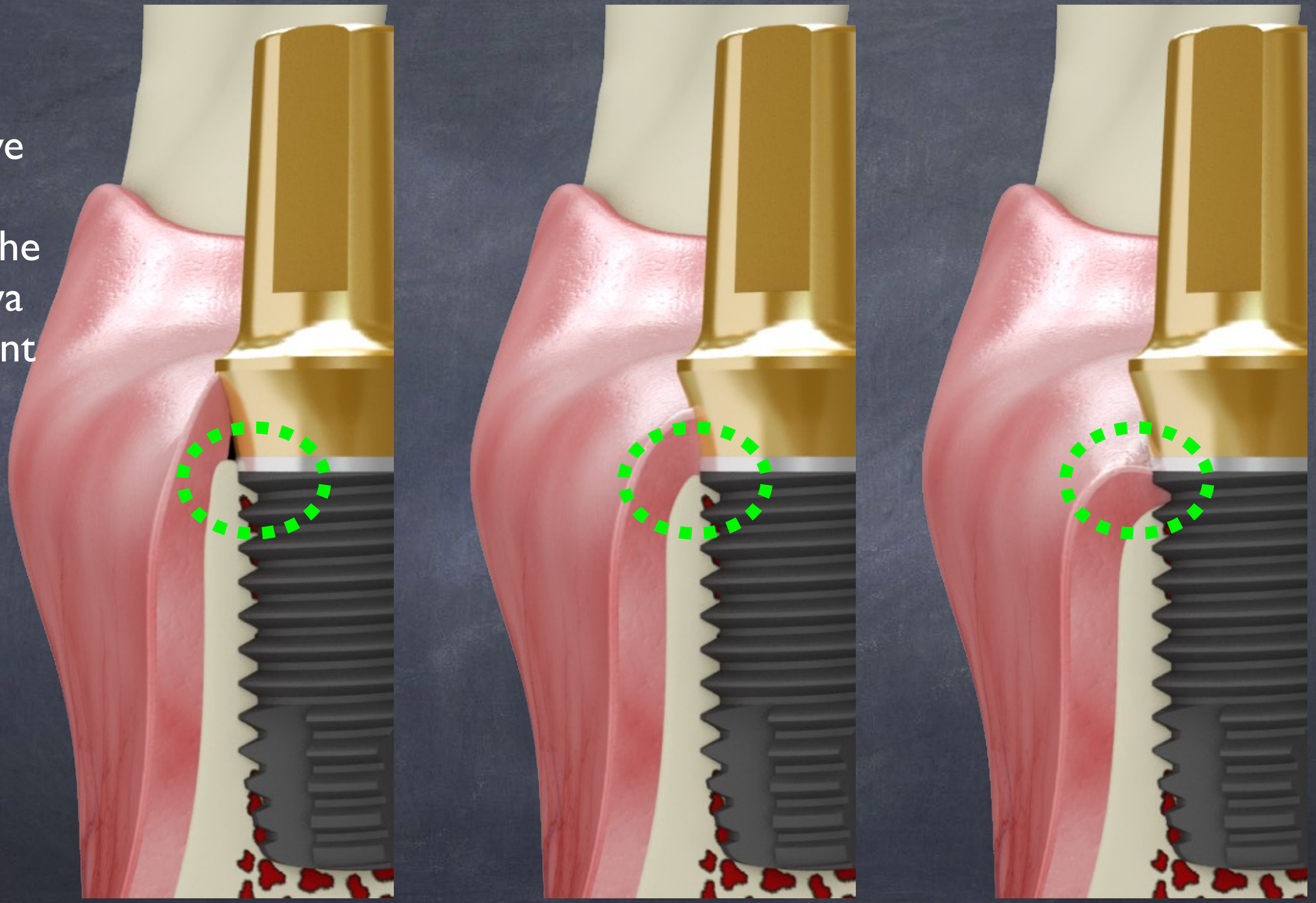
The Bone sets the Tone

Biologic Height-Width Ratio of the Buccal Supra-Implant Mucosa

Takeshi Nozawa, DDS
Private Practice, Niigata, Japan

Correspondence to: Dr Takeshi Nozawa
6-7 Sakae-cho, Ojiya-shi, Niigata-Ken, 947-0011, Japan
phone: 81 258 82 0169; fax: 81 258 82 2857; e-mail: nozawa-perio-implant@world.com.ne.jp

Most of us have experienced recessions on the marginal gingiva following implant prosthesis!



We know that the gain after this invasive CT graft can gain +0.34mm on average

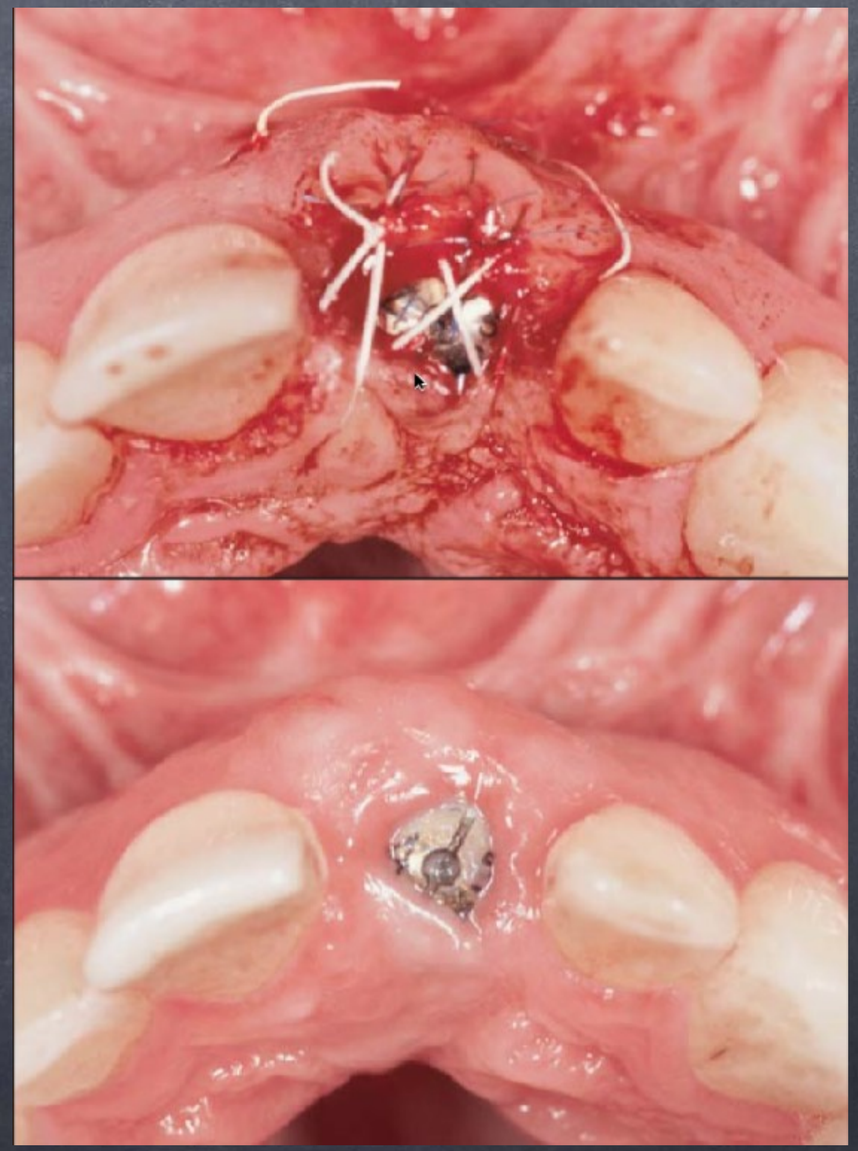
IJPRD 2011

Crestal Ridge Width Changes When Placing Implants at the Time of Tooth Extraction With and Without Soft Tissue Augmentation After a Healing Period of 6 Months: Report of 24 Consecutive Cases

*Ueli Grunder, DDS**

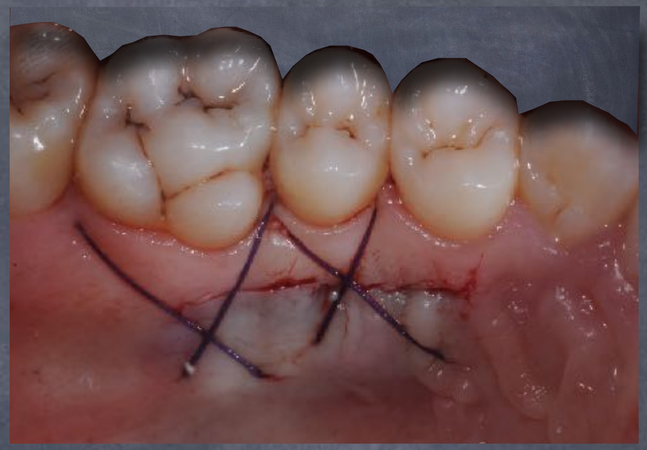
- 1.06 mm loss of volume in the non-grafted group
+ 034 slight gain in the grafted group

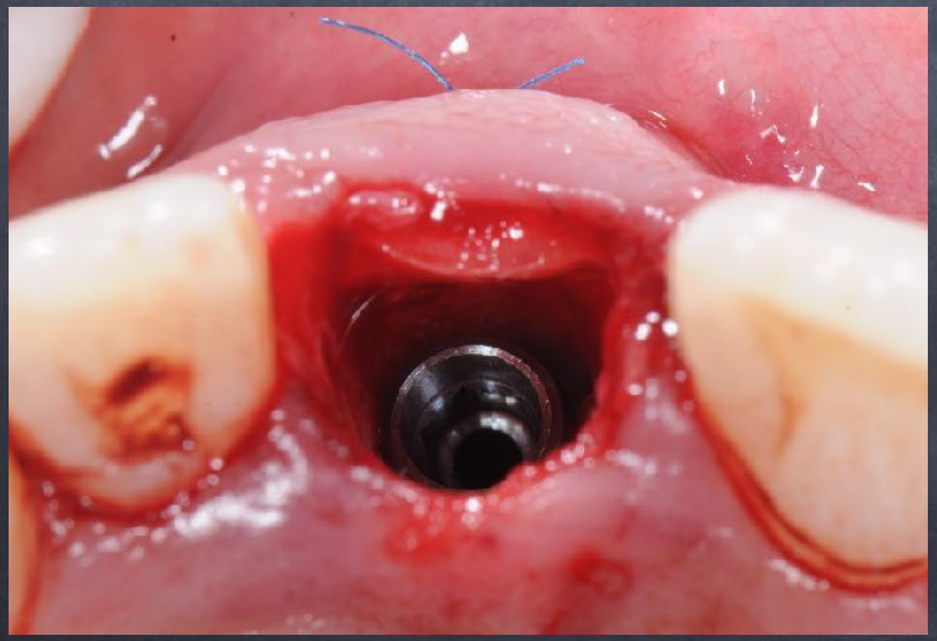
Use of a subepithelial connective tissue graft at the time of immediate implant insertion in the esthetic zone is an effective treatment option to compensate for the expected loss of labial soft tissue volume and to maintain good esthetic results over time.



We know that the gain after this invasive CT graft can make only +0.34mm gain in average...

IJPRD 2011





Crestal Ridge Width Changes When Placing Implants at the Time of Tooth Extraction With and Without Soft Tissue Augmentation After a Healing Period of 6 Months: Report of 24 Consecutive Cases

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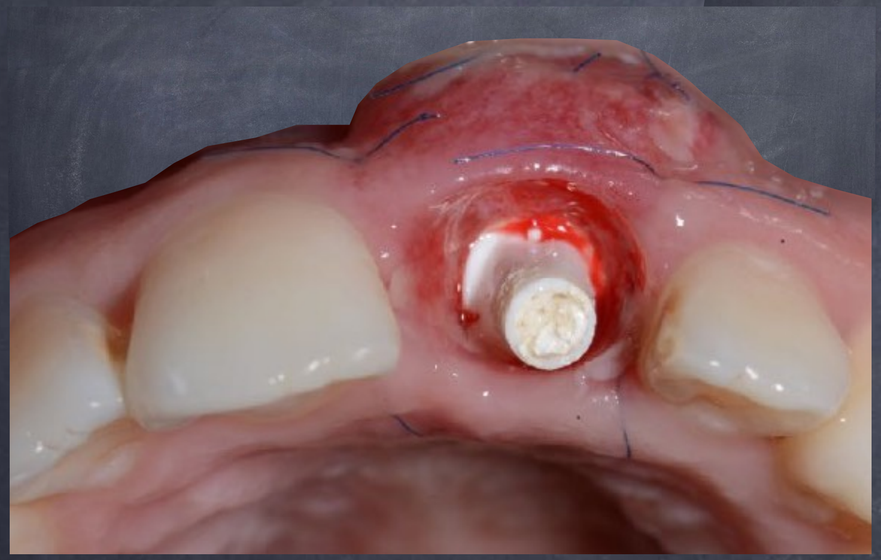
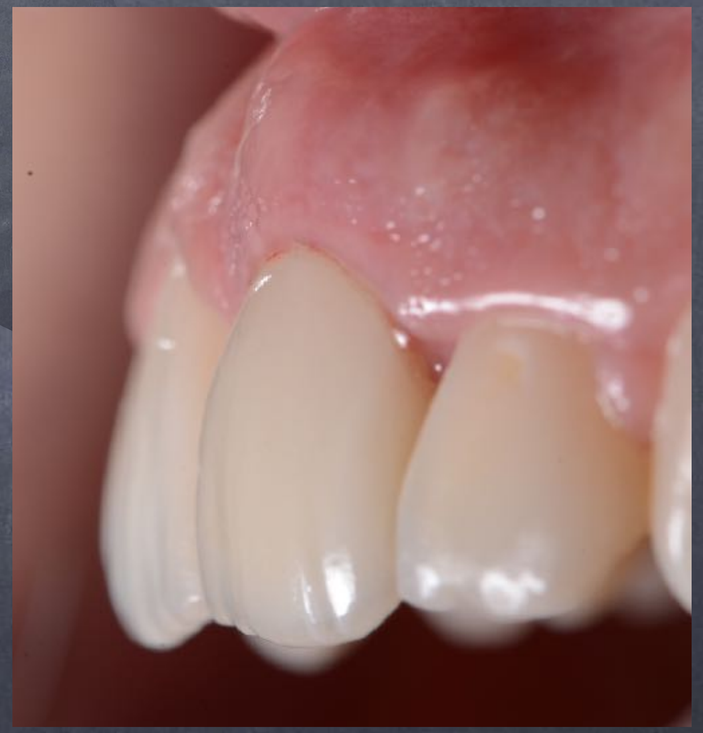
We know that the gain after this invasive CT graft can make only +0.34mm gain in average...

IJPRD 2011

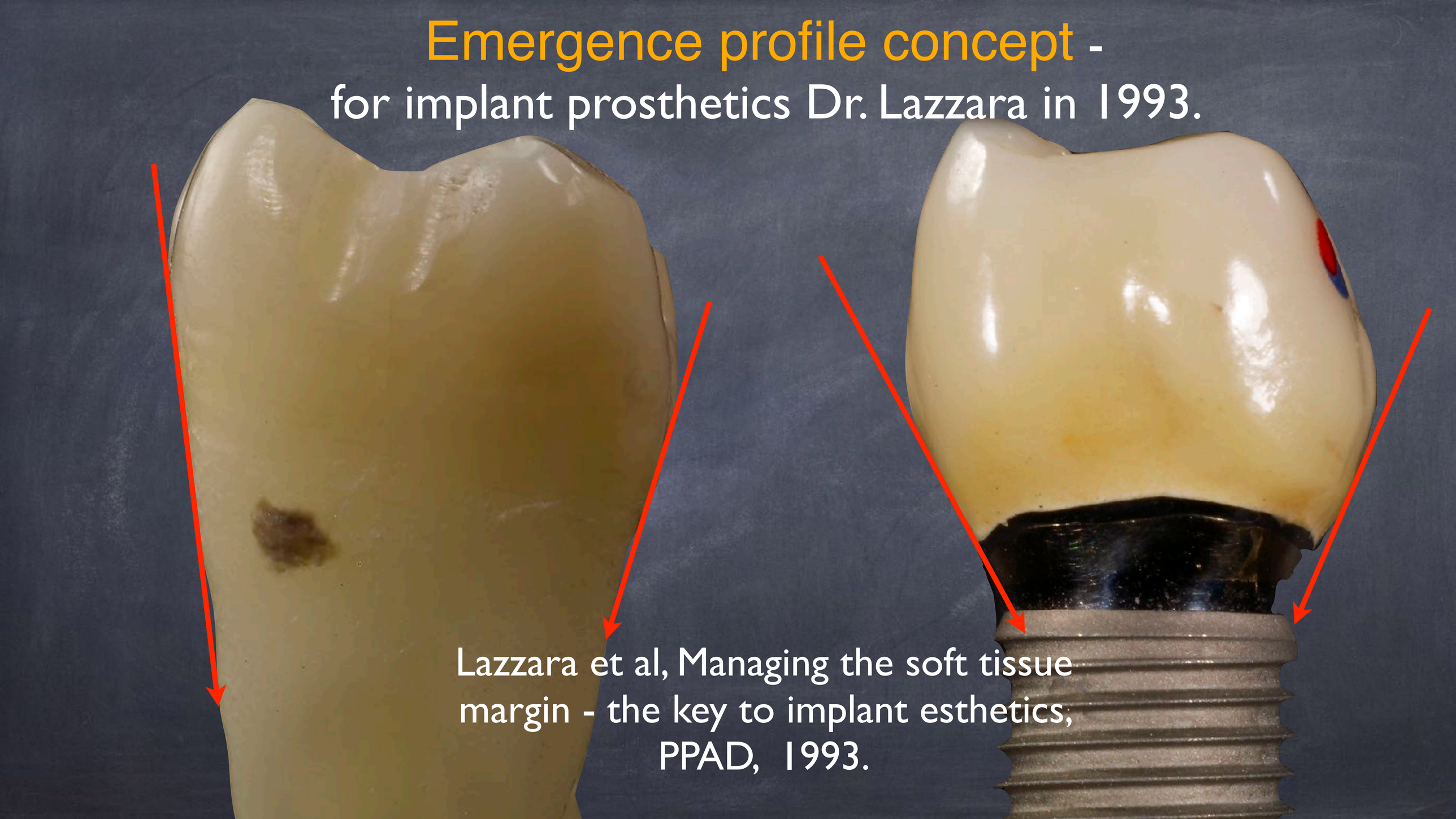




Crestal Ridge Width Changes When Placing Implants at the Time of Tooth Extraction With and Without Soft Tissue Augmentation After a Healing Period of 6 Months: Report of 24 Consecutive Cases

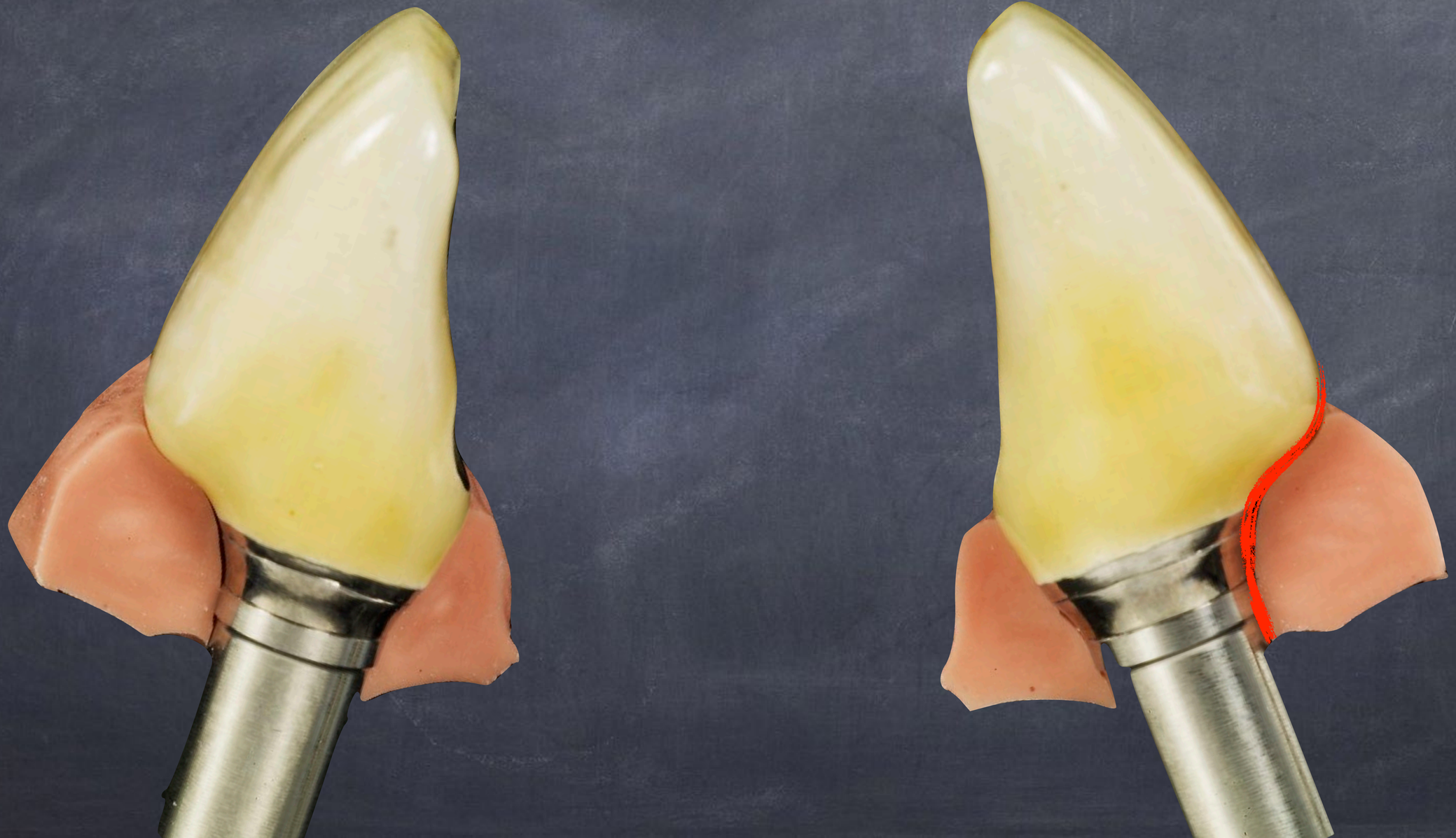
*Ueli Grunder, DDS**

Emergence profile concept -
for implant prosthetics Dr. Lazzara in 1993.

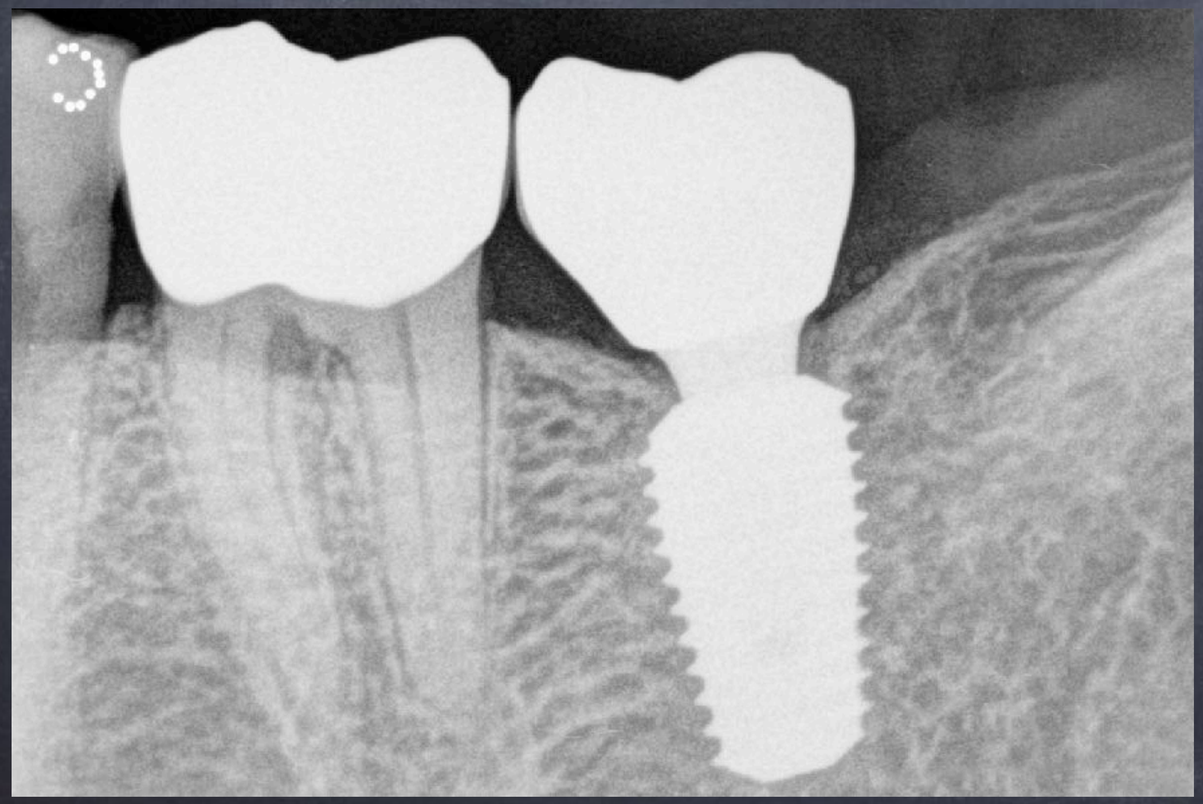


Lazzara et al, Managing the soft tissue margin - the key to implant esthetics, PPAD, 1993.

S-LINE

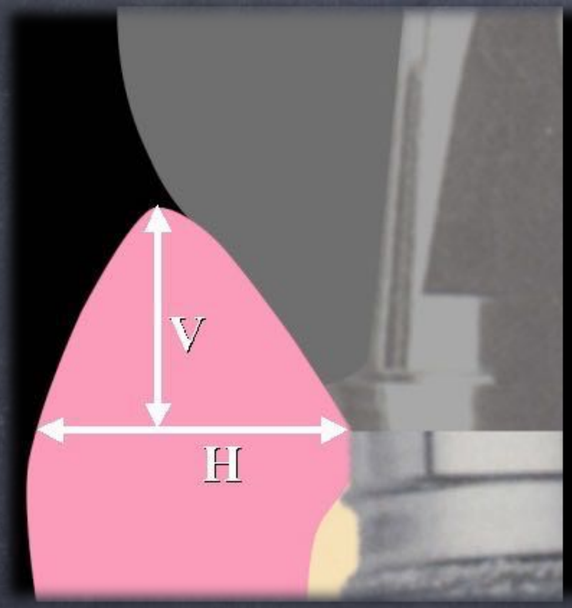


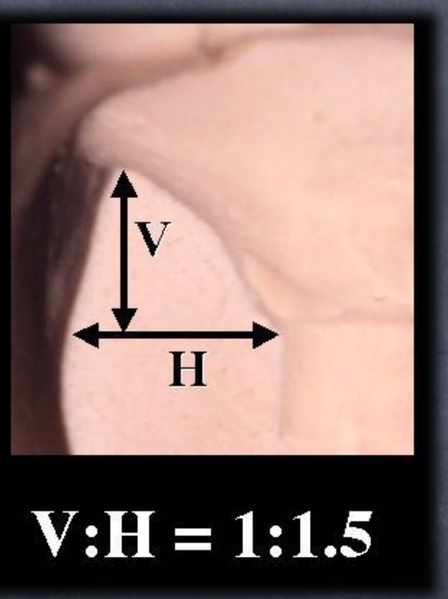
S-LINE



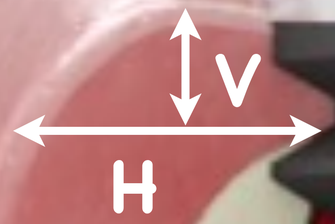
- Nozawa T, Enomoto H, Turumaki S, Sugiyama T, Kurasima T, Watanabe F, Ito K

Biologic ratio of supra-implant mucosa





V:H = 1:1.5

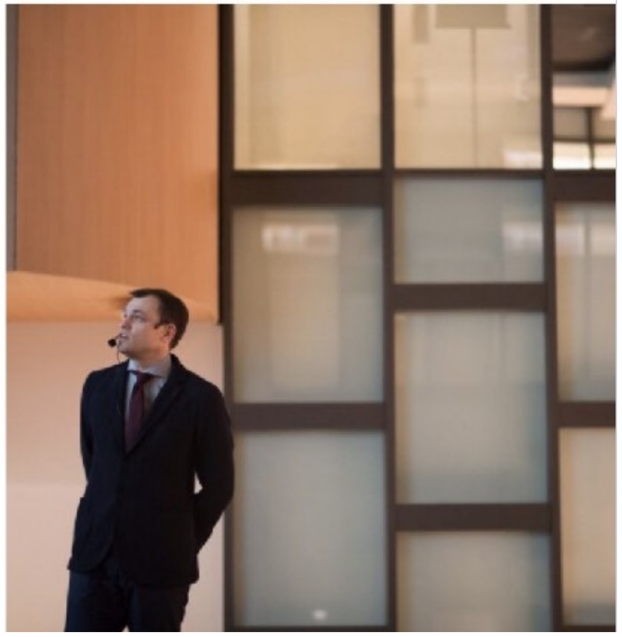


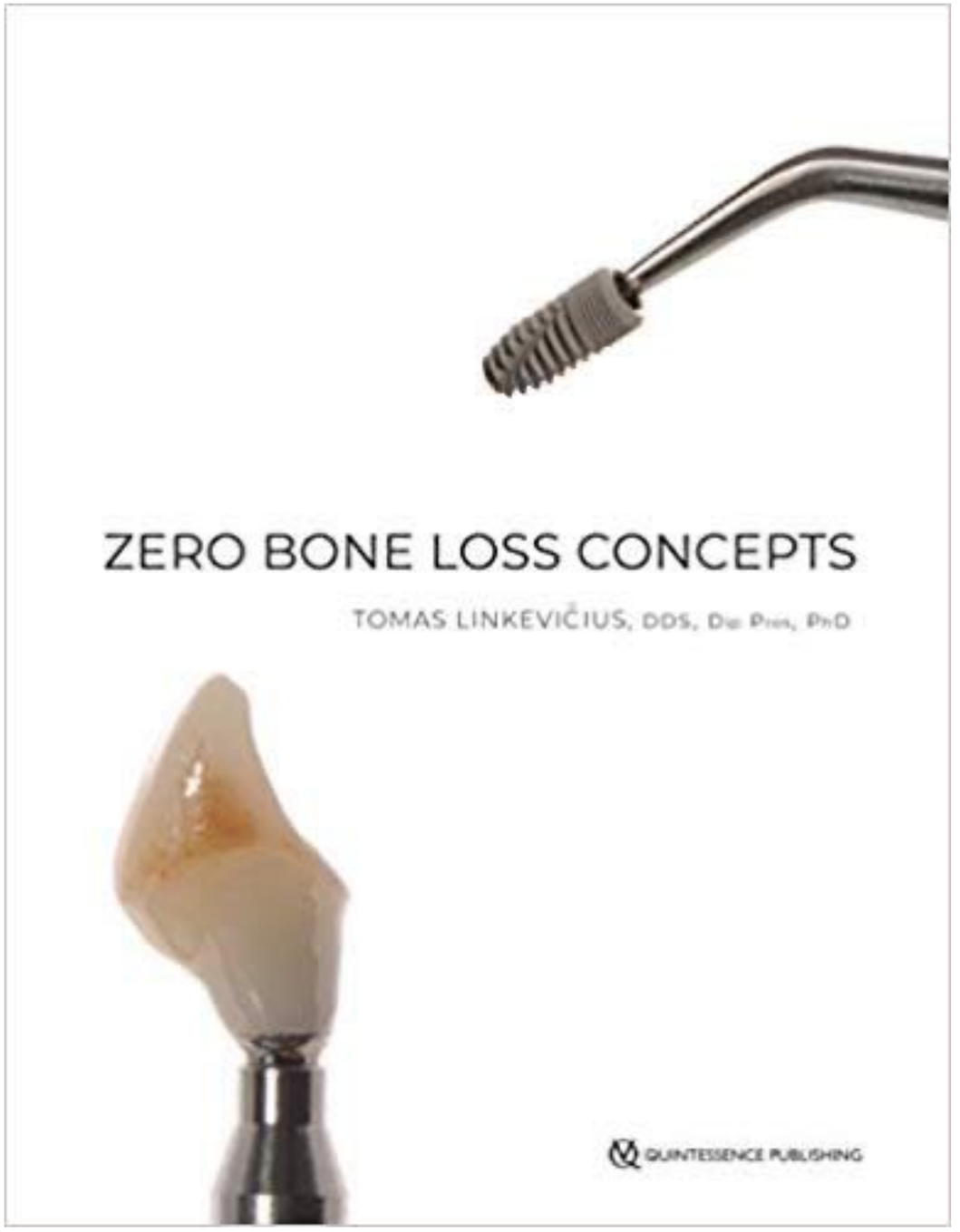
ZERO BONE LOSS CONCEPTS

by Prof. Tomas Linkevičius

CRESTAL BONE STABILITY WITH EVERY IMPLANT

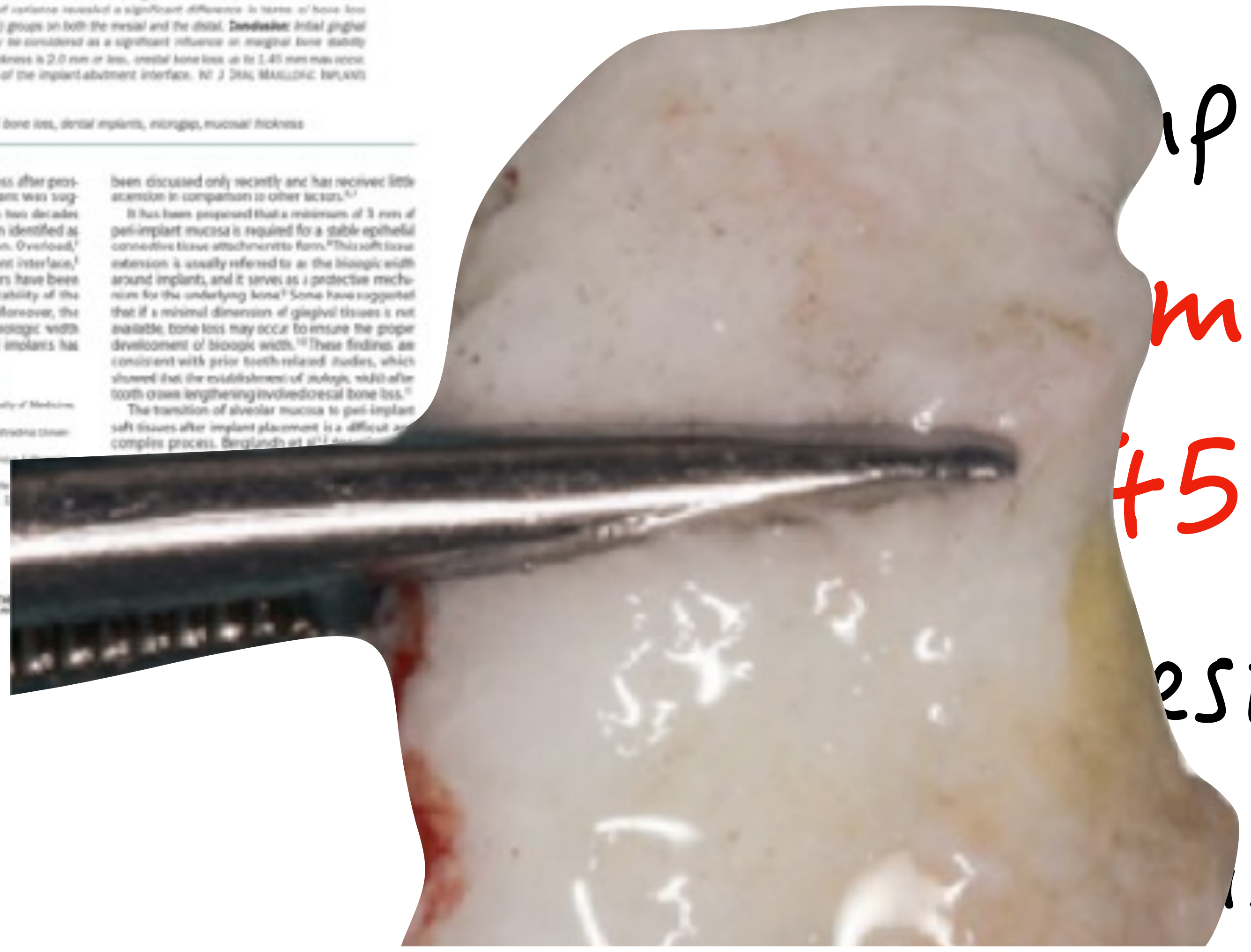
NEW! ZBLC Immediate MasterClass



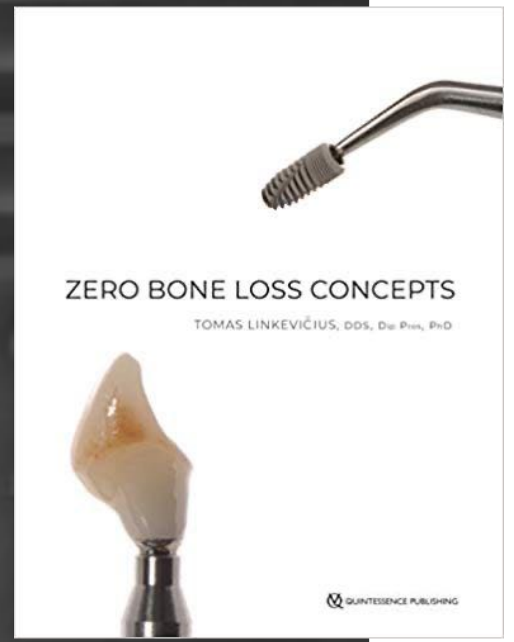


Zero Bone Loss Concept

H = 3mm

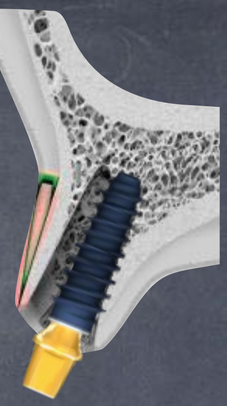


Initial gingival tissu thic ness at the
crest may be conside ed a a significant
influence on marg e stability
plants. If ue thicknes
m or less, bone loss u
45 mm ma despite a
estal posit e implant-
butmen ce.



Tomas Linkevicius DDS Phd et al 2009 JOMI

Platform shifting
for Better Peri-Implant Biotype



RESULTED FROM A MISTAKE WHEN WIDE IMPLANTS WERE USED AND MIS-MATCHING ABUTMENTS WHERE PROVIDED TO THE CLINICIANS.

AFTER THESE ABUTMENTS WHERE DELIVERED, DURING THE OBSERVATIONALLY PERIOD, THE MARGINAL BONE LOSS WAS NOT PRESENT IN ALMOST EVERY CASES (LAZZARA & PORTER 2006).

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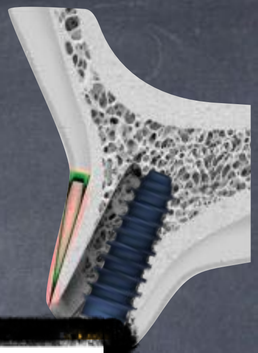
Platform shifting for Better Peri-Implant Biotype



1 Canullo L, et al. Platform switching and marginal bone-level alterations: The results of a randomized-controlled trial, *Clin Oral Implants Res* 2010;21:115-121.

2 Baumgarten H, et al. A new implant design for crestal bone preservation: Initial observations and case report. *Pract Proceed Aesthet Dent* 2005;17:735-740.

3 Lazzara RJ, et al. Platform switching: A new concept in implant dentistry for controlling postoperative crestal bone levels. *Int J Perio Rest Dent* 2006;26:9-17

4 Ericsson I, et al. Different types of inflammatory reactions in peri-implant soft tissues. *J Clin Perio* 1995;22:255-261.

5 Atieh MA, et al. Platform switching for marginal bone preservation around dental implants: A systematic review and meta-analysis. *J Perio* 2010;81:1350-1366.

6 Cochran DL, et al. Biologic width around titanium implants: a histometric analysis of the implanto-gingival junction around unloaded and loaded non-submerged implants in the canine mandible. *J Perio* 1997;68:186-198.

7 Gargiulo AW, et al. Dimensions and relations of the dentogingival junction in humans. *J Perio* 1961;32:261-267.

8 Hermann JS, et al. Crestal bone changes around titanium implants: a radiographic evaluation of unloaded non-submerged and submerged implants in the canine mandible. *J Perio* 1997;68:1117-1130.

9 Rodríguez-Ciurana X, et al. The effect of interimplant distance on the height of the interimplant bone crest when using platform-switched implants. *Int J Perio Rest Dent* 2009;29:141–151.

10 Tarnow DP, et al. The effect of inter-implant distance on the height of the inter-implant bone crest. *J Perio* 2000;71:546-549.

11 Greenstein G, et al. Treatment planning implant dentistry with a 2 mm twist drill. *Compendium* 2010;31(2):2-10

12 Vela-Nebot X, et al. Benefits of an implant platform modification technique to reduce crestal bone resorption. *Implant Dent* 2006;15:313–320.

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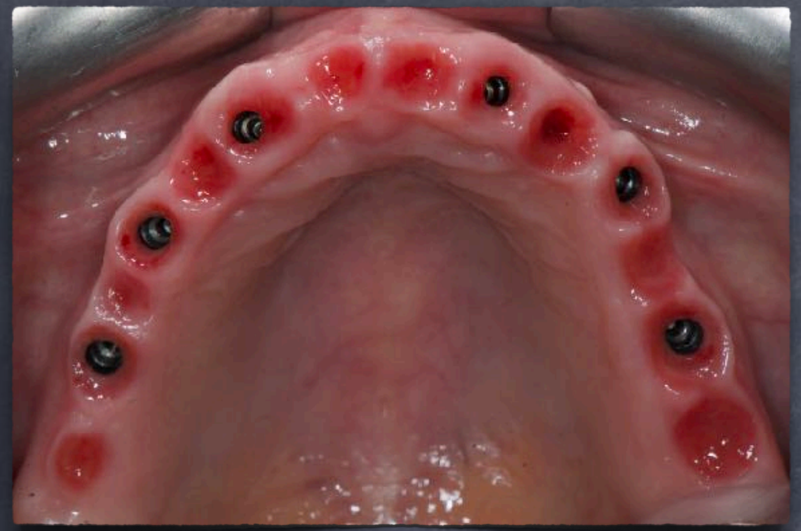
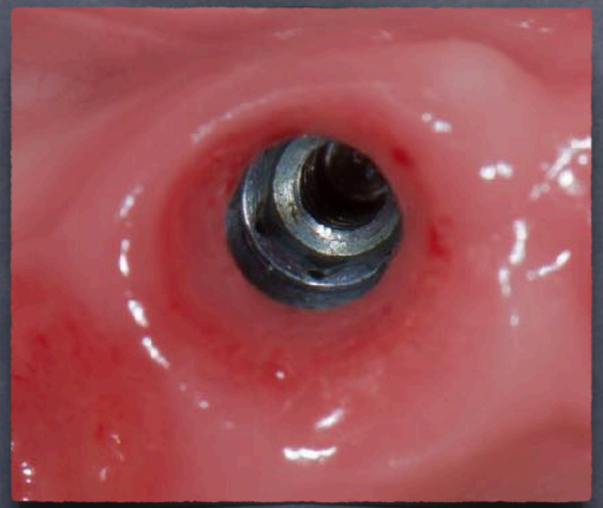
‘Double Offset’ design for better peri-marginal tissues



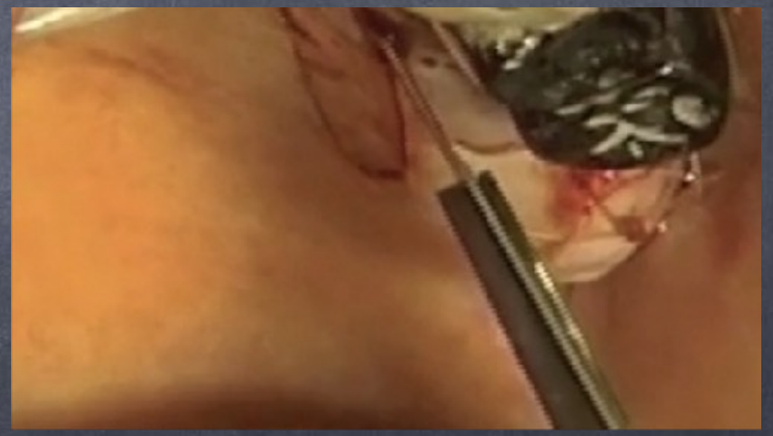


Increasing Kertinized tissue Thickness and Quality for Implants

Apically Repositioned Flap

Connective Tissue Graft

Free Gingival Graft



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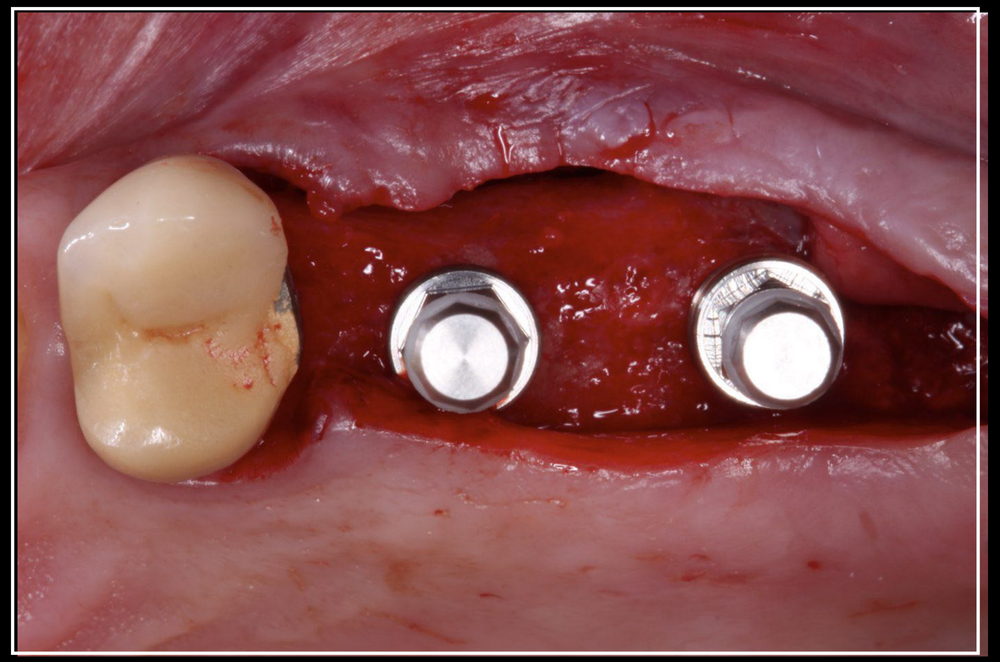
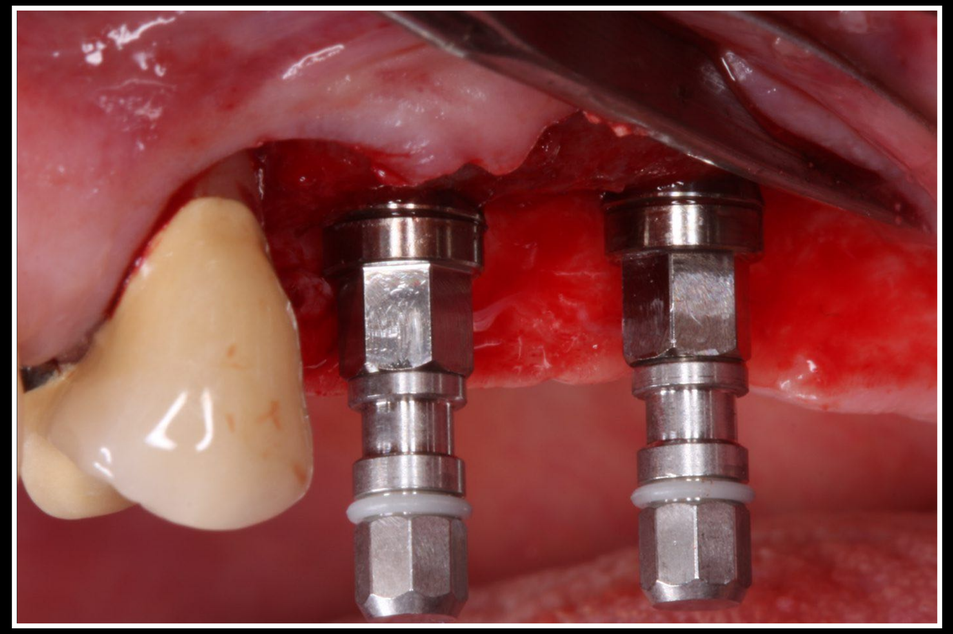
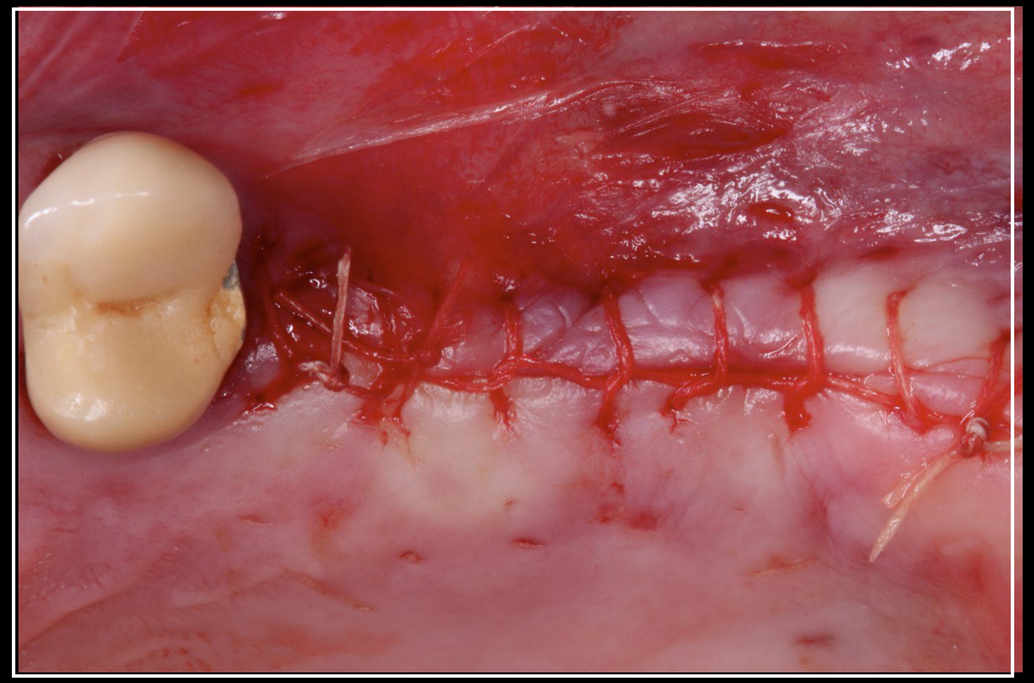
Apical reposition flap



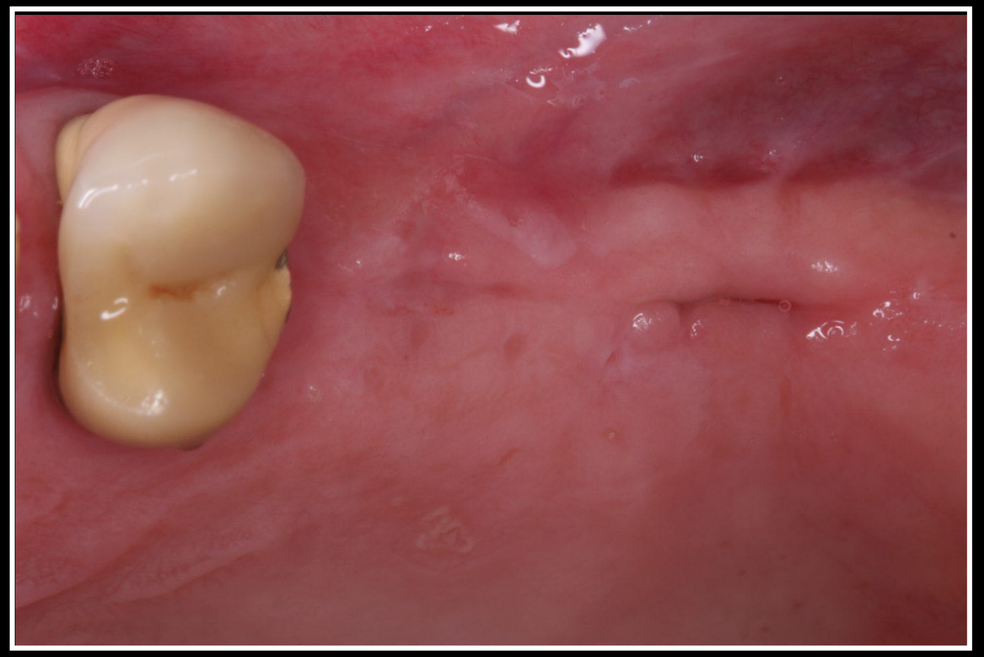
initial situation



Apical reposition flap

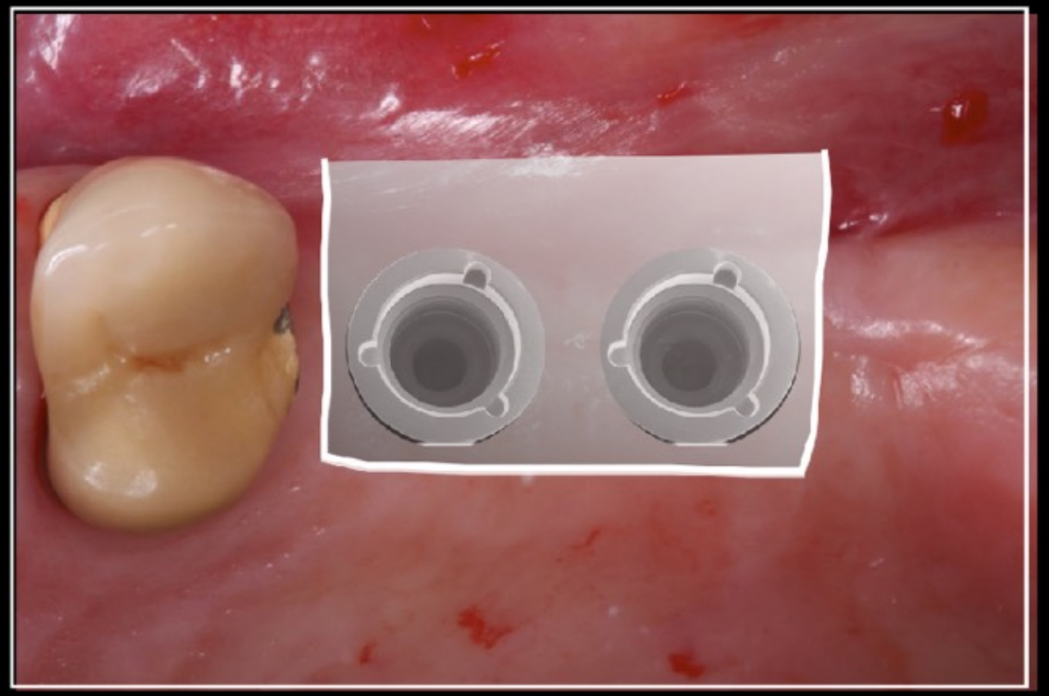


suturing



2 weeks post Op

Apical reposition flap



pre second-stage surgery

Flow chart

Thin apical mucosa flap preparation

↓

if necessary, thin out remaining connective tissue - periosteum

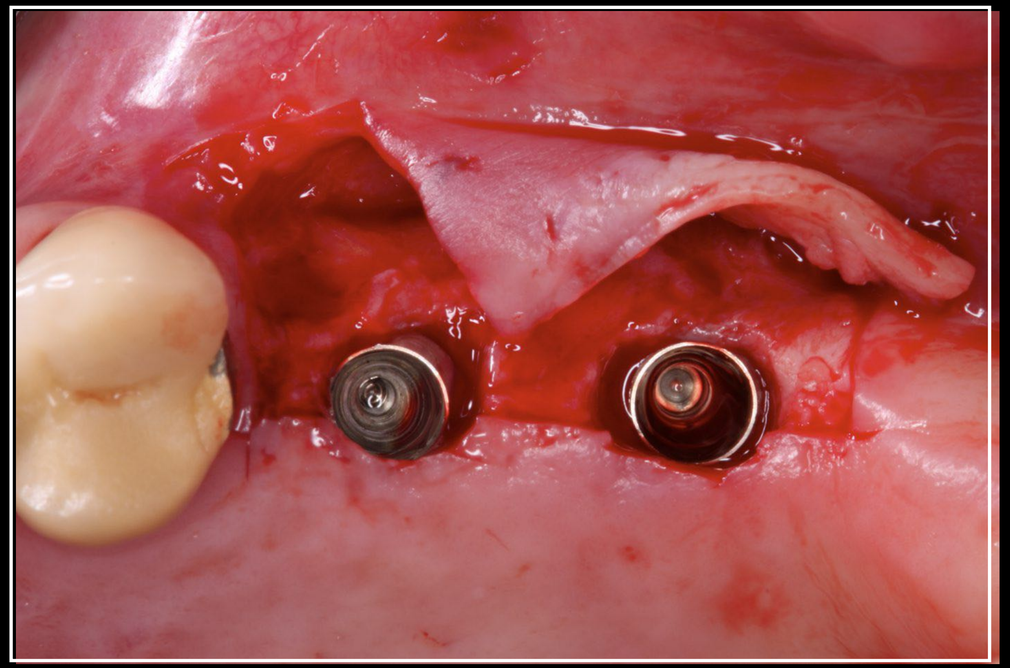
↓

reposition keratinized tissue in apical position

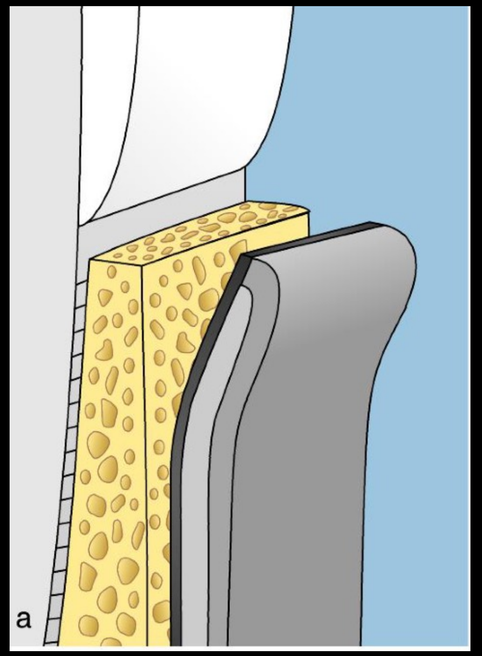
↓

suturing interrupted & horizontal-crossed mattress

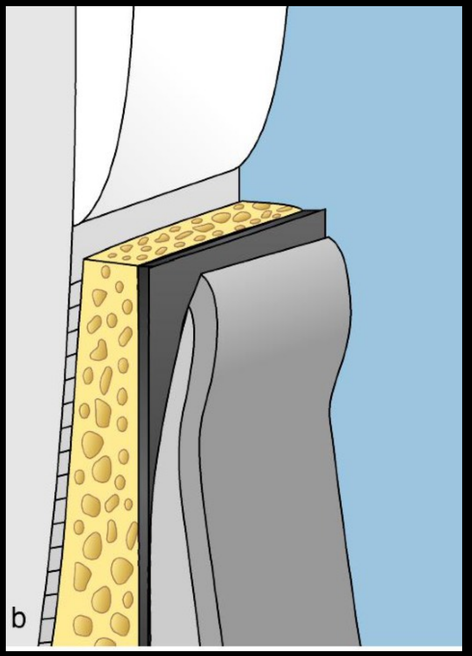
Apical reposition flap



raised split-thickness flap

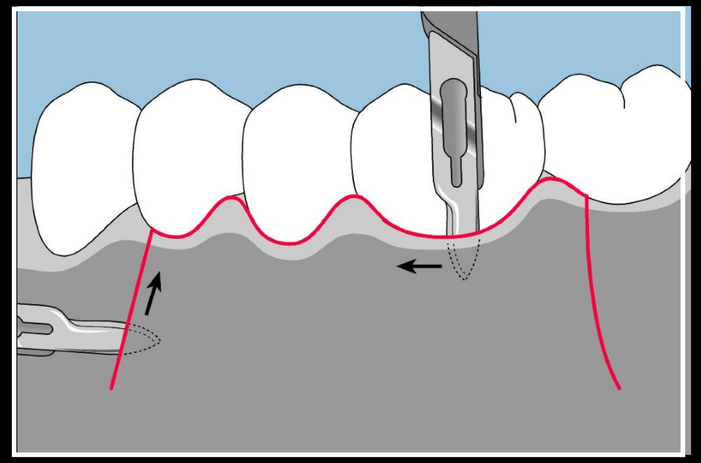


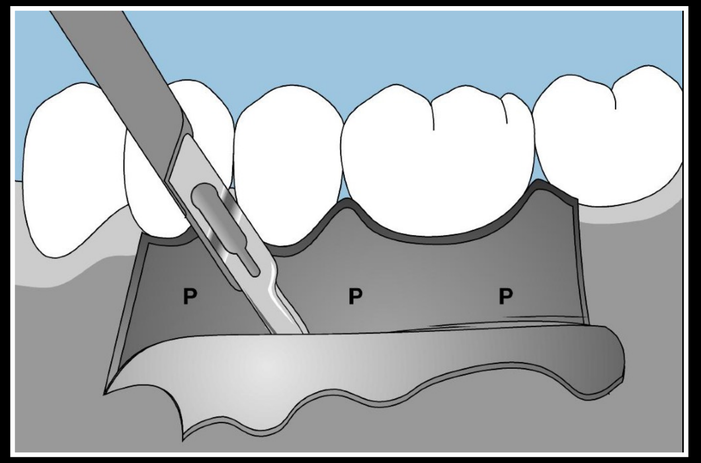
full flap

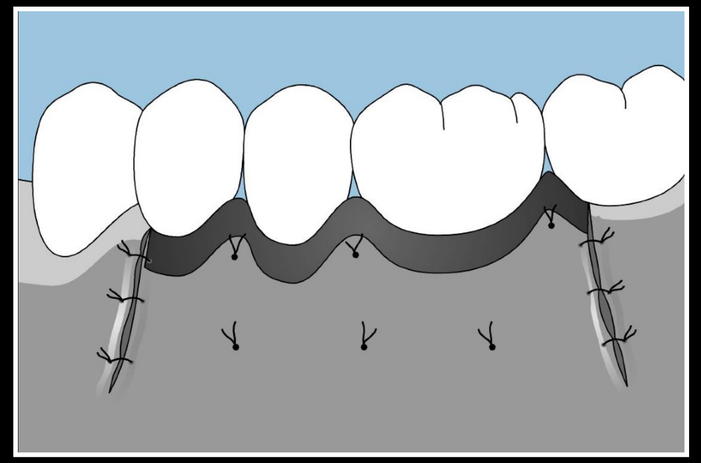


split-thickness flap

A p i c a l r e p o s i t i o n f l a p





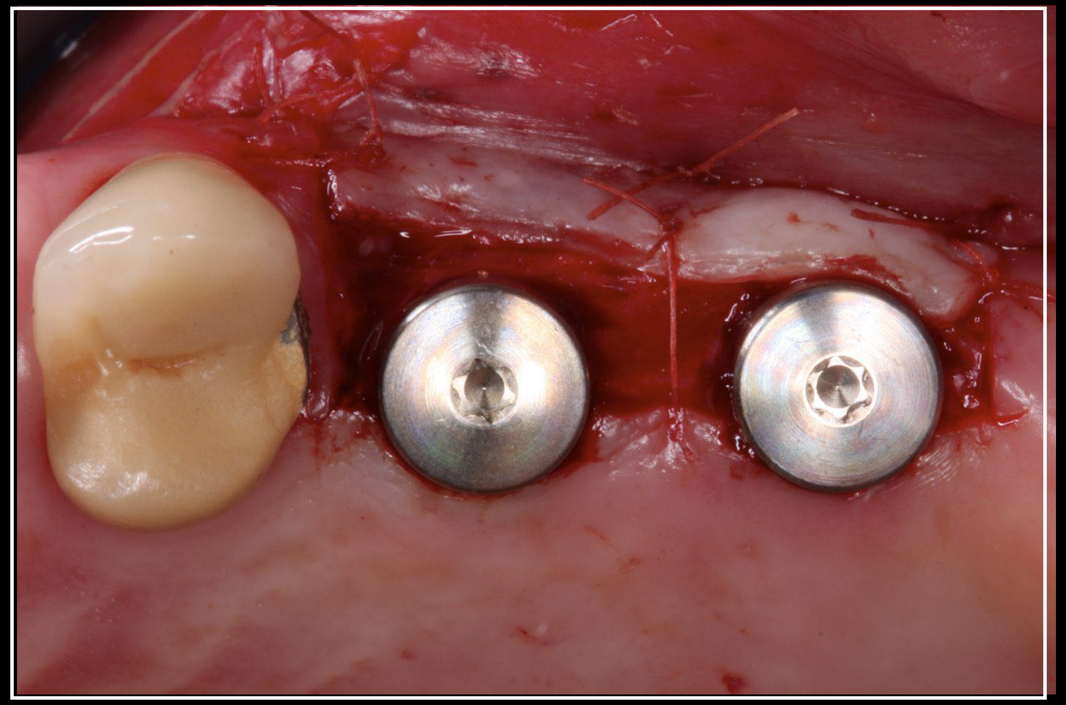


split-thickness flap

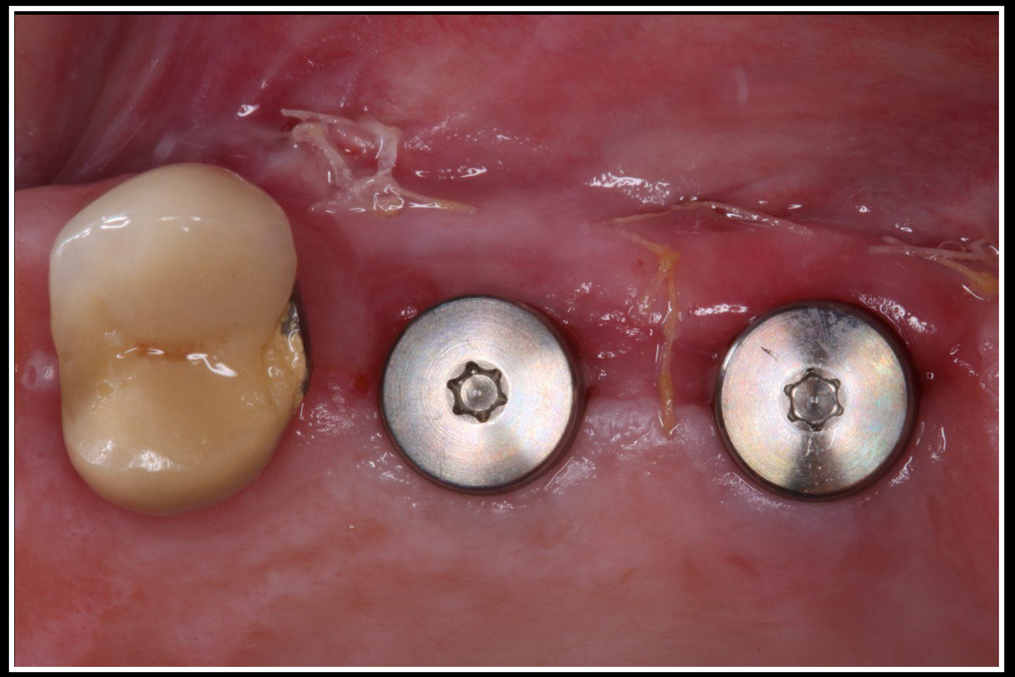
Advantages

no bone resorption
maintain / gain keratinized gingiva
free apical reposition

Apical reposition flap



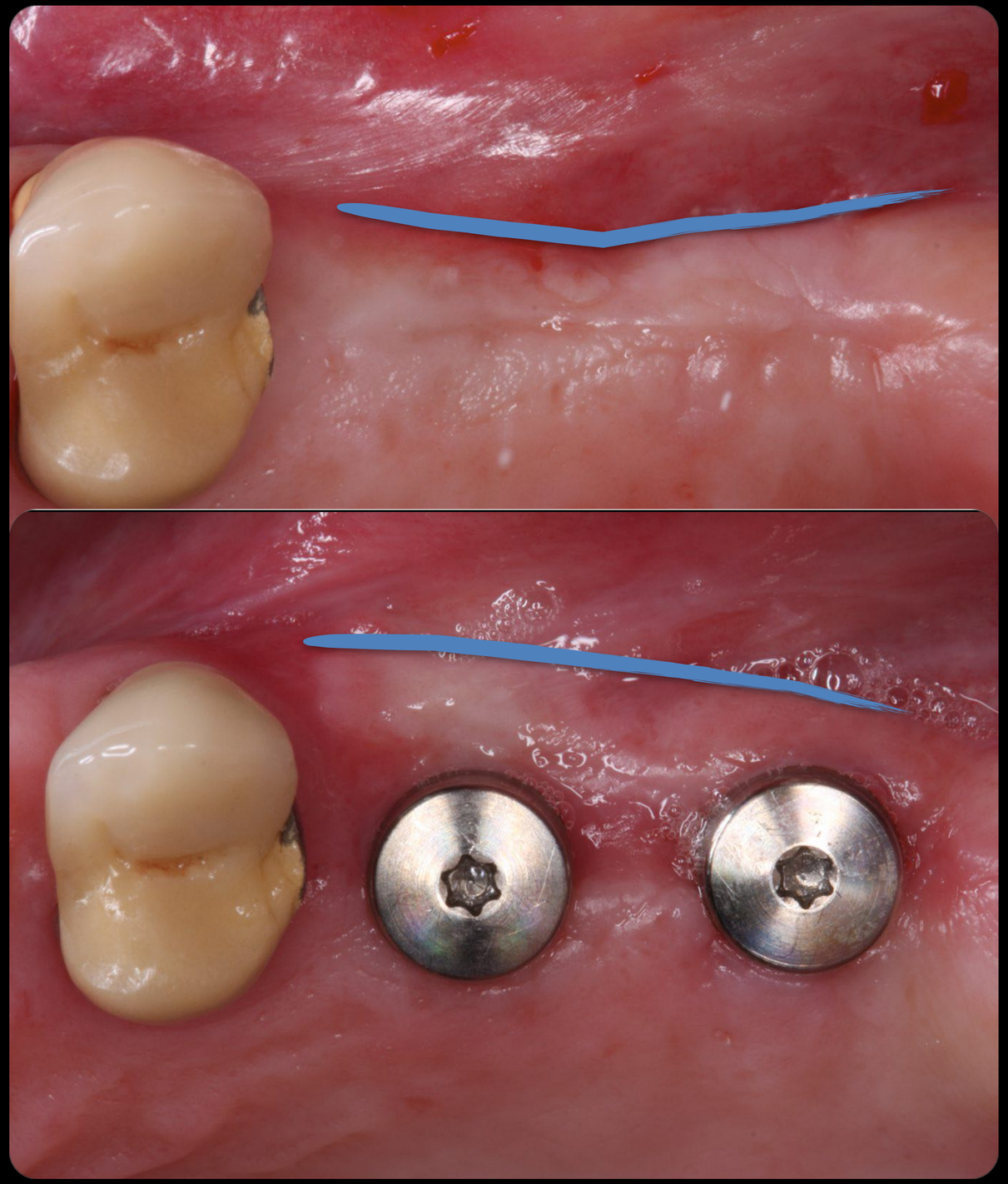
suturing



1 week post Op

Initial

Final



CHARACTERESTICS OF THICK BIOTYPE

- Relatively flat soft tissue and bony architecture.
- Dense fibrotic soft tissue.
- Relatively large amount of attached gingiva.
- Thick underlying osseous form.
- Resistant to acute trauma.
- Reacts to disease with pocket formation.
- More thick and resistant to Recession.

KAO,RT., PASQUINELLIK; Thick Vs. Thin gingival tissue: a key determinant in tissue response to disease and restorative treatment. California Dent. Associat. 30(7): 521-6, July 2002

LESS SCALLOPED AND THICK BIOTYPE

CHARACTERISTICS OF THIN BIOTYPE

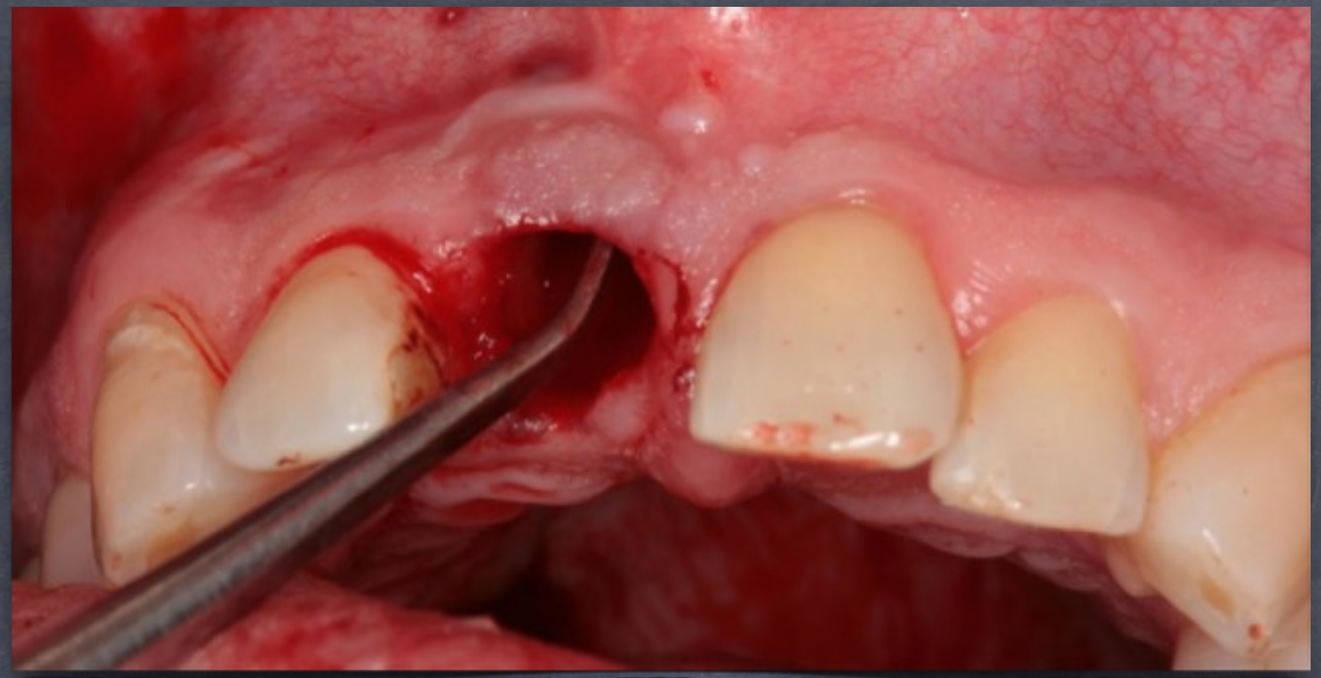
- Increased Scalloping in soft tissue and bone.
- Delicate friable tissue.
- Minimal amount of attached gingiva.
- Thin underlying bone characterized by bony dehisence and fenestration.
- Reacts to insult and disease with gingival recession.
- Incresed risk of interproximal tissue loss.

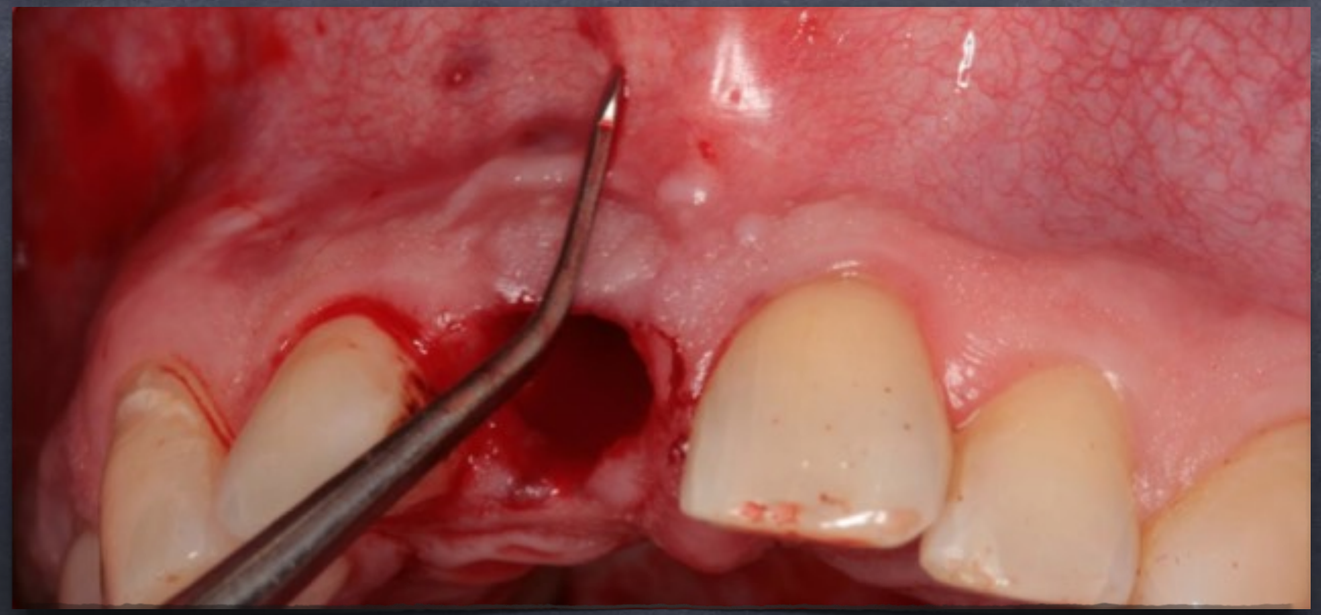
KAO,RT., PASQUINELLIK; Thick Vs. Thin gingival tissue: a key determinant in tissue response to disease and restorative treatment. California Dent. Associat. 30(7): 521-6, July 2002

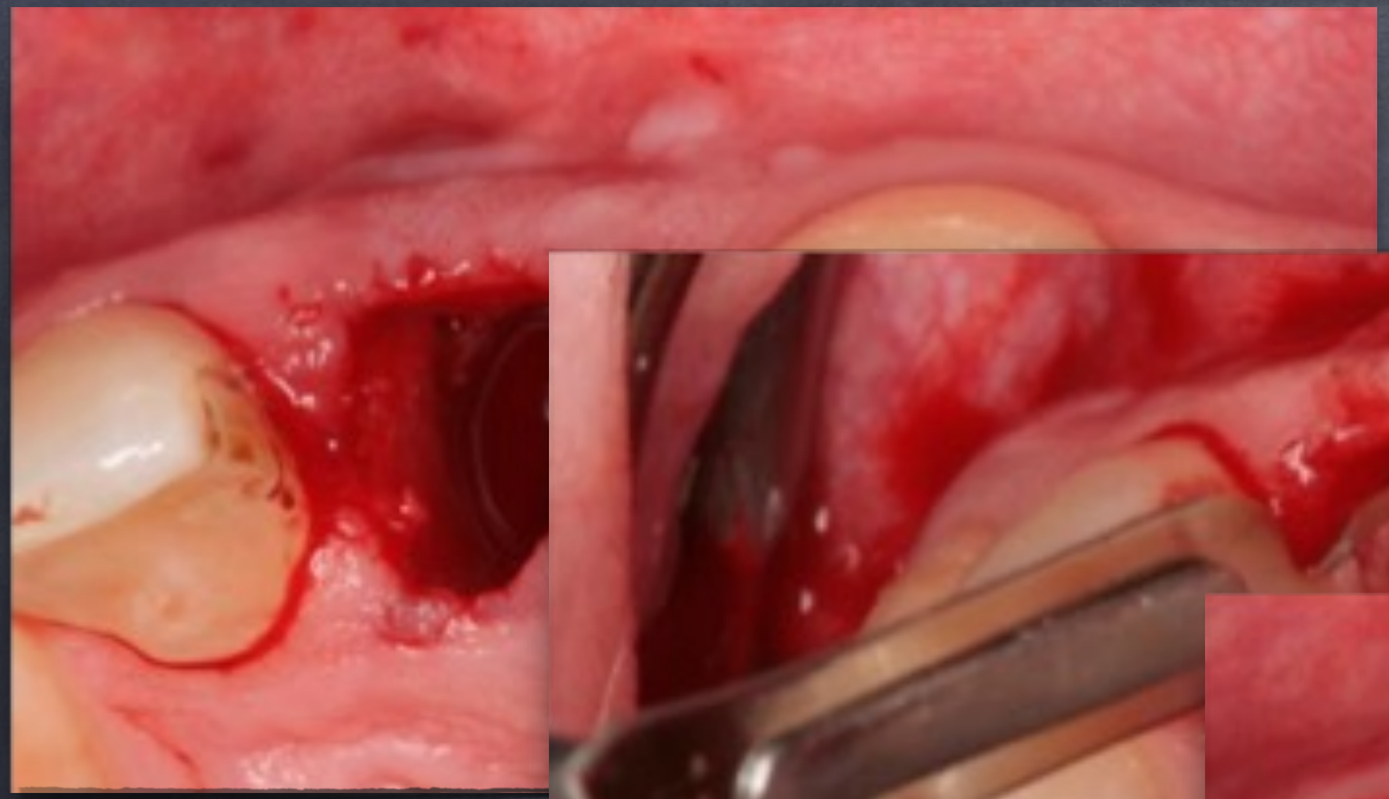
MORE SCALLOPED AND THIN BIOTYPE

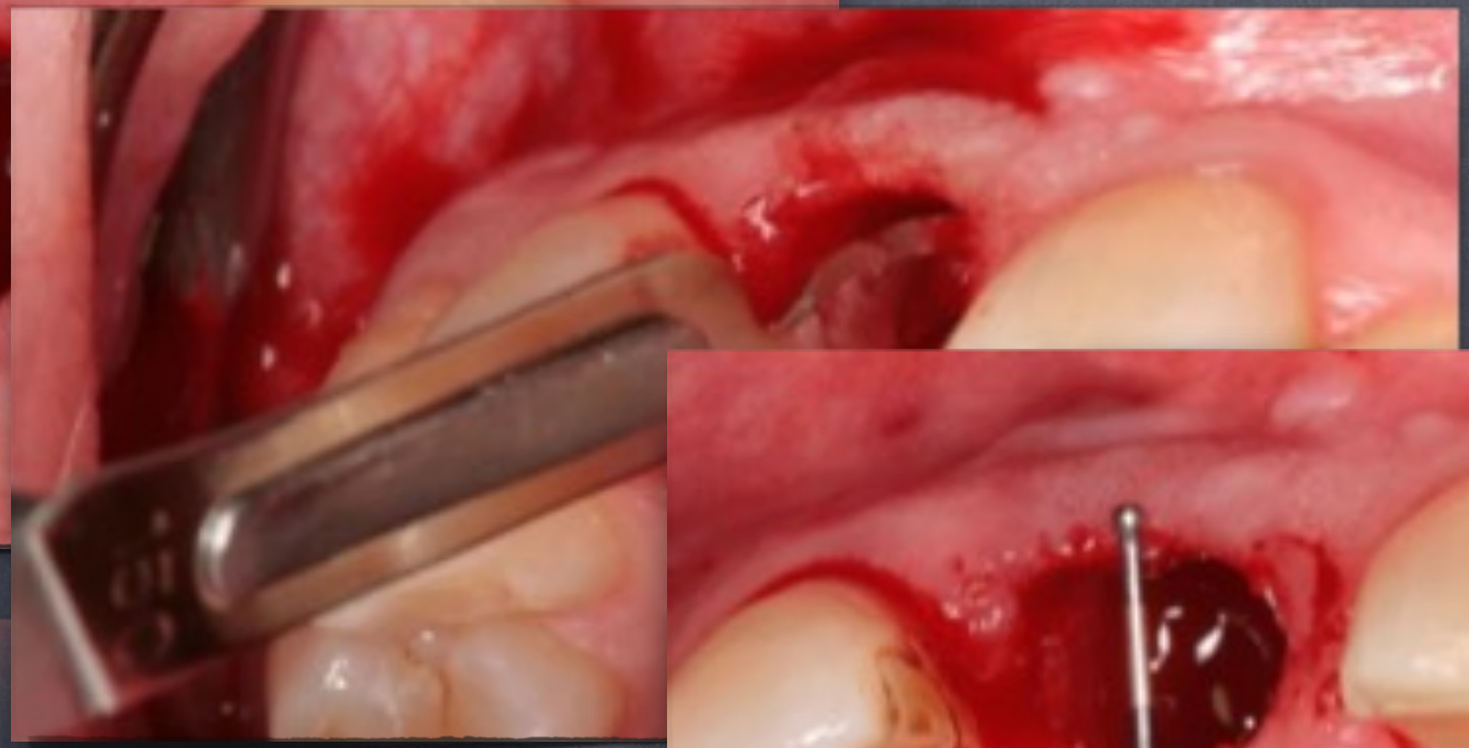
GENERAL DIAGNOSTIC CRITERIA FOR IMMEDIATE PLACEMENT

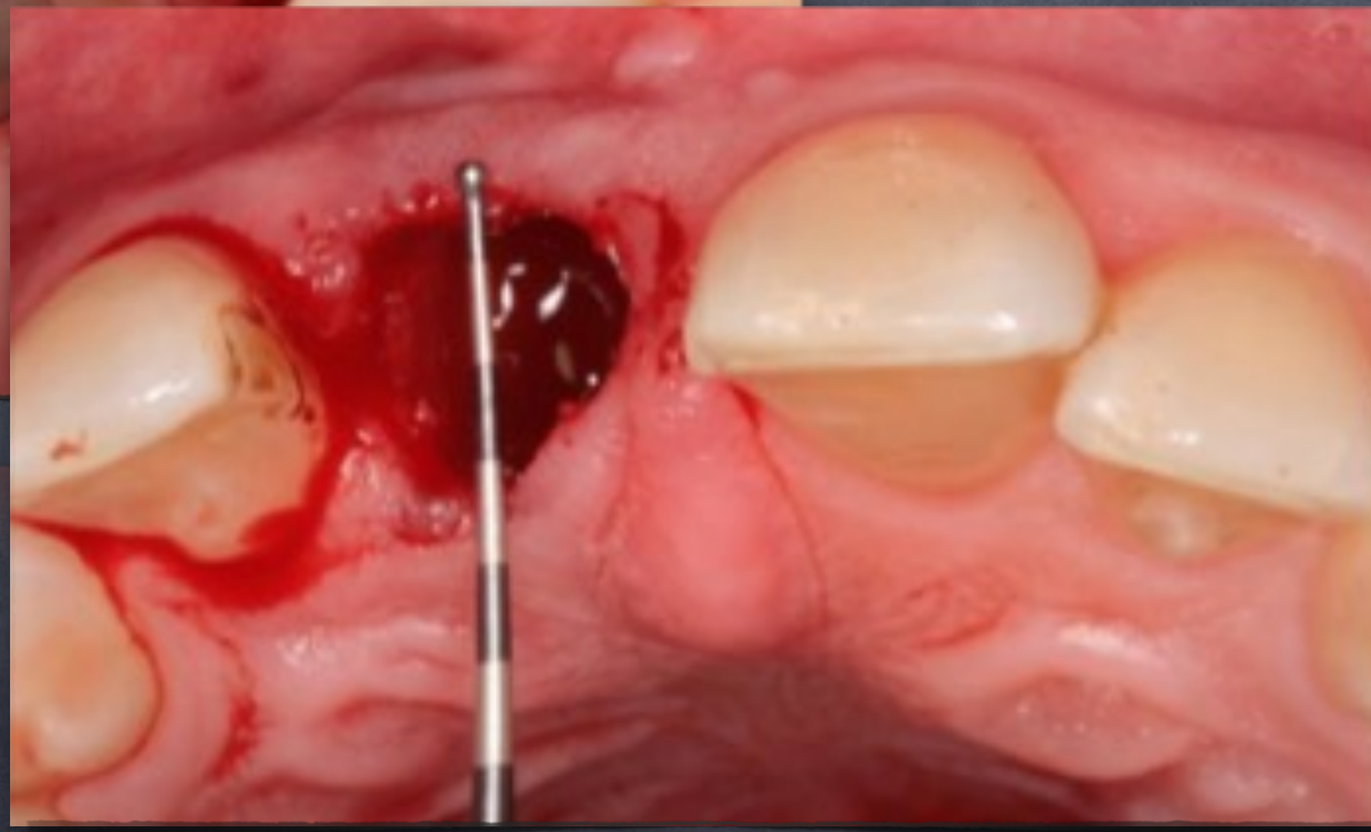
	FAVORABLE	UNFAVORABLE
TOOTH POSITION/FGM	*MORE CORONAL*	*MORE APICAL*
GINGIVAL FORM	*FLAT SCALLOPED*	*HIGH SCALLOPED*
BIOTYPE	*THICK*	*THIN*
TOOTH SHAPE	*SQUARE*	*TRIANGULAR*
OSSEOUS CREST POSITION	*HIGH CREST < 3mm from adjascent teeth & facially*	*LOW CREST measures > 4mm from adjasent teeth & facially*

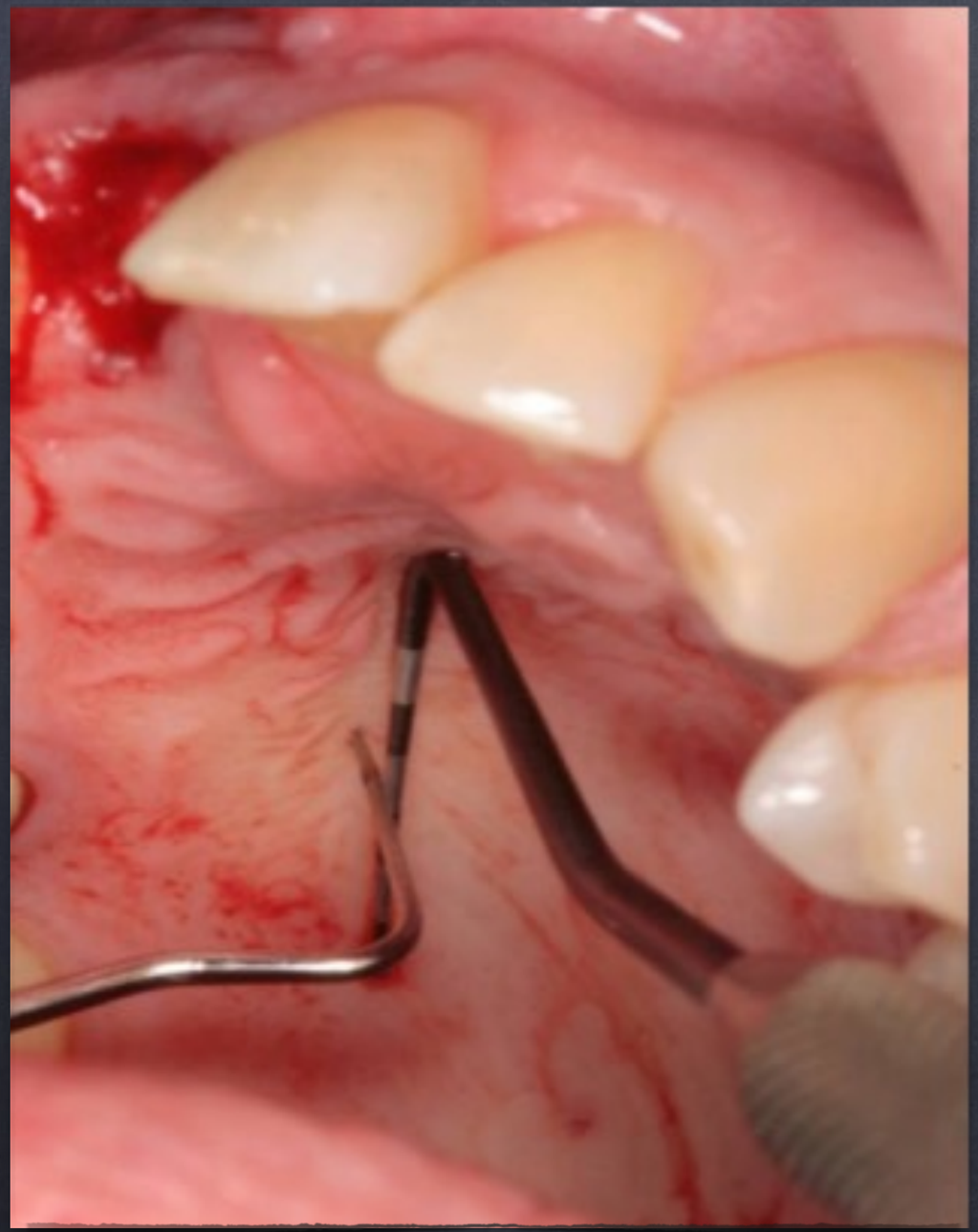




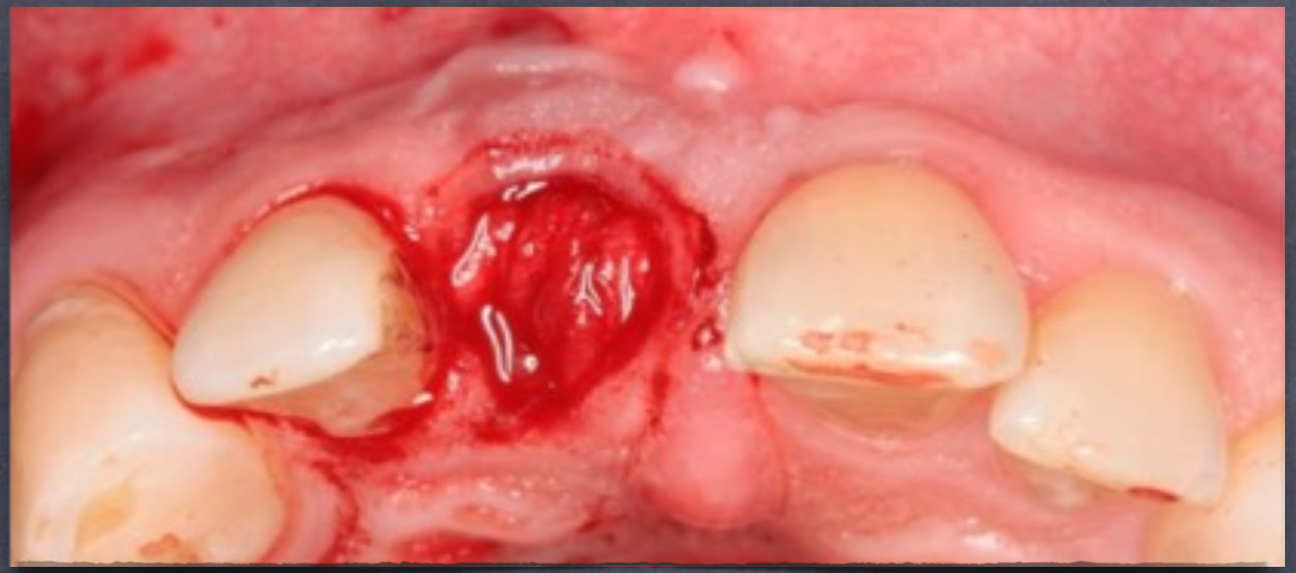


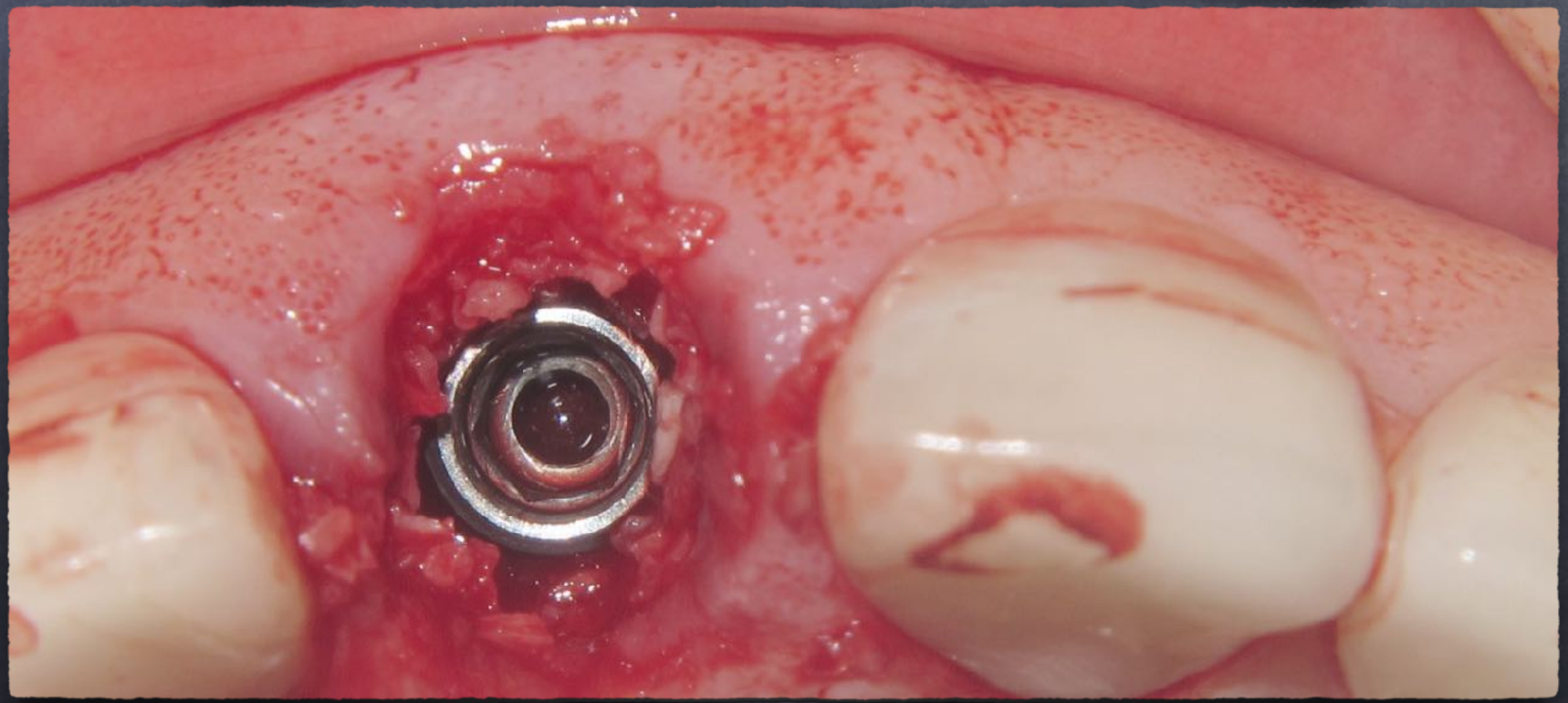


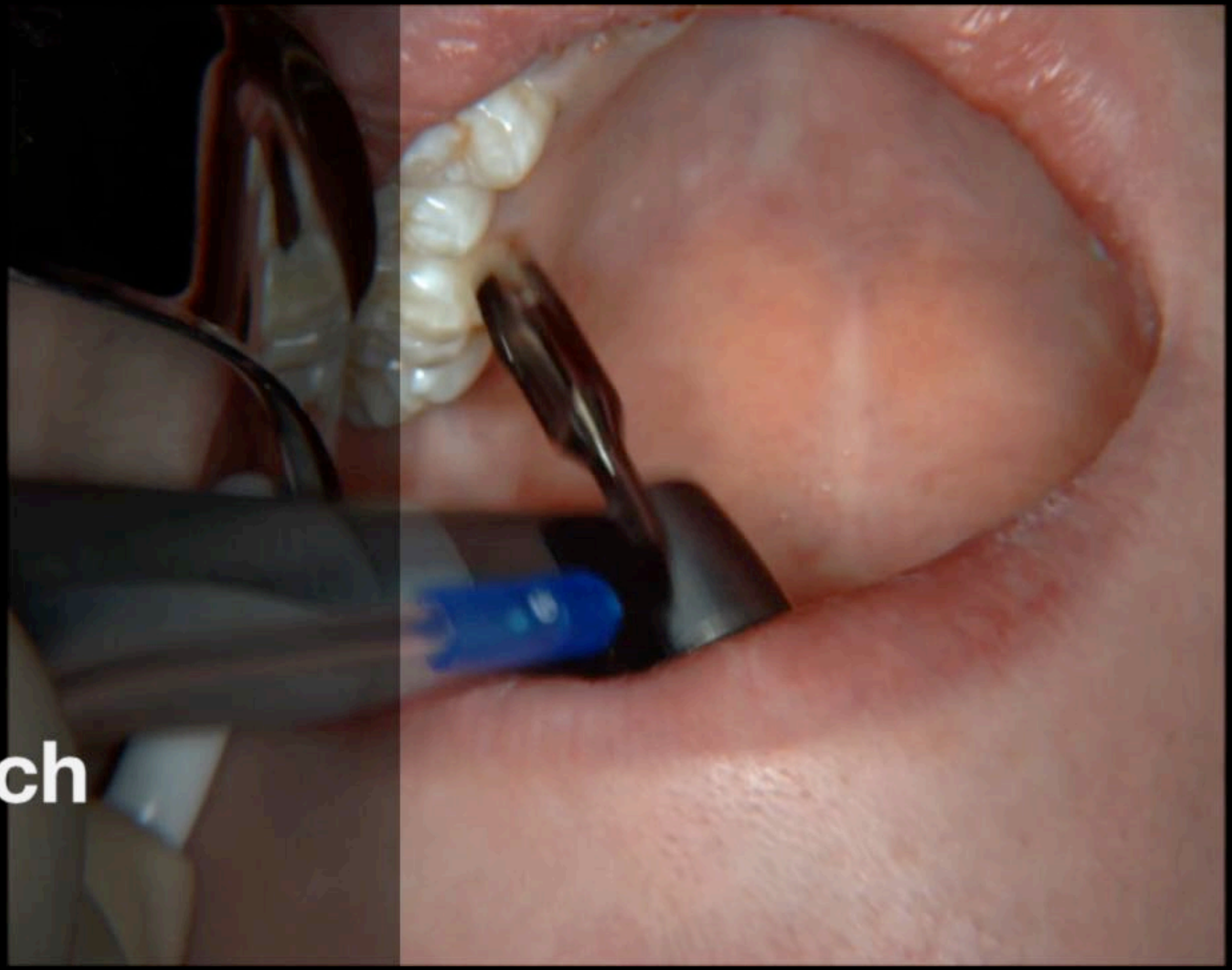




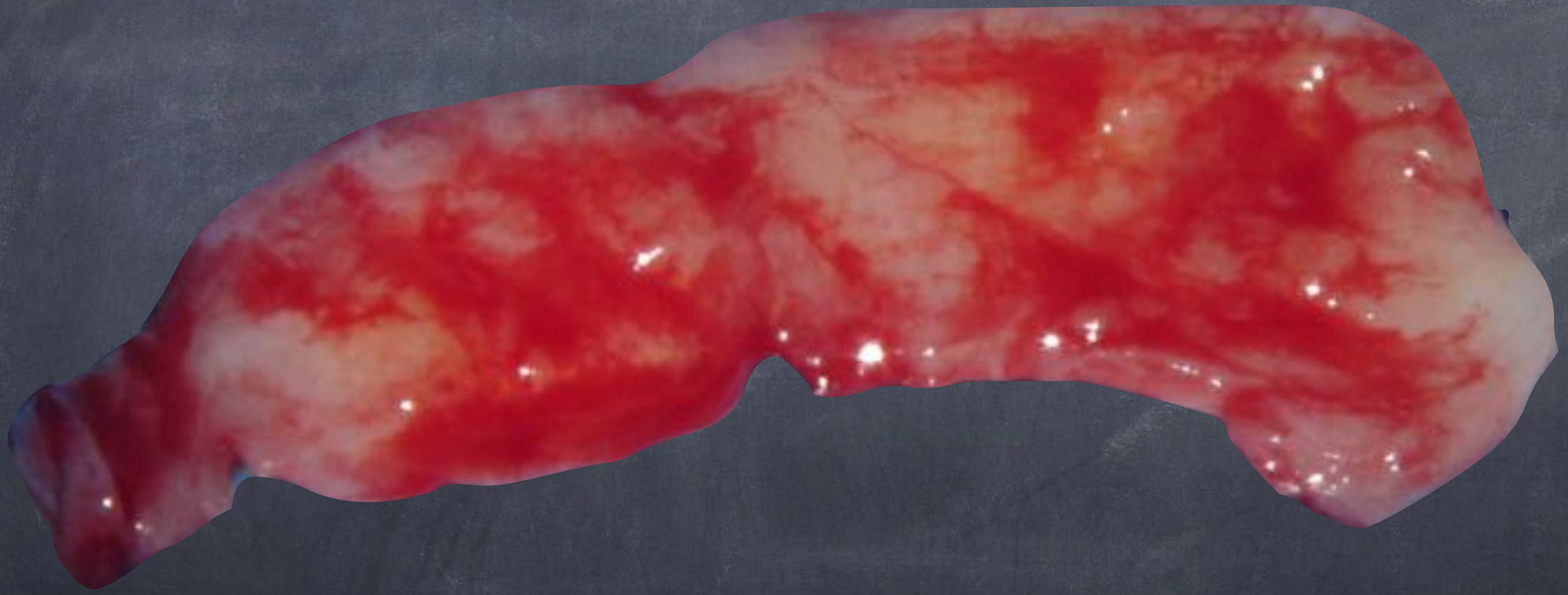
The Tissue is the Issue






punch

FGG following Guided bone regeneration

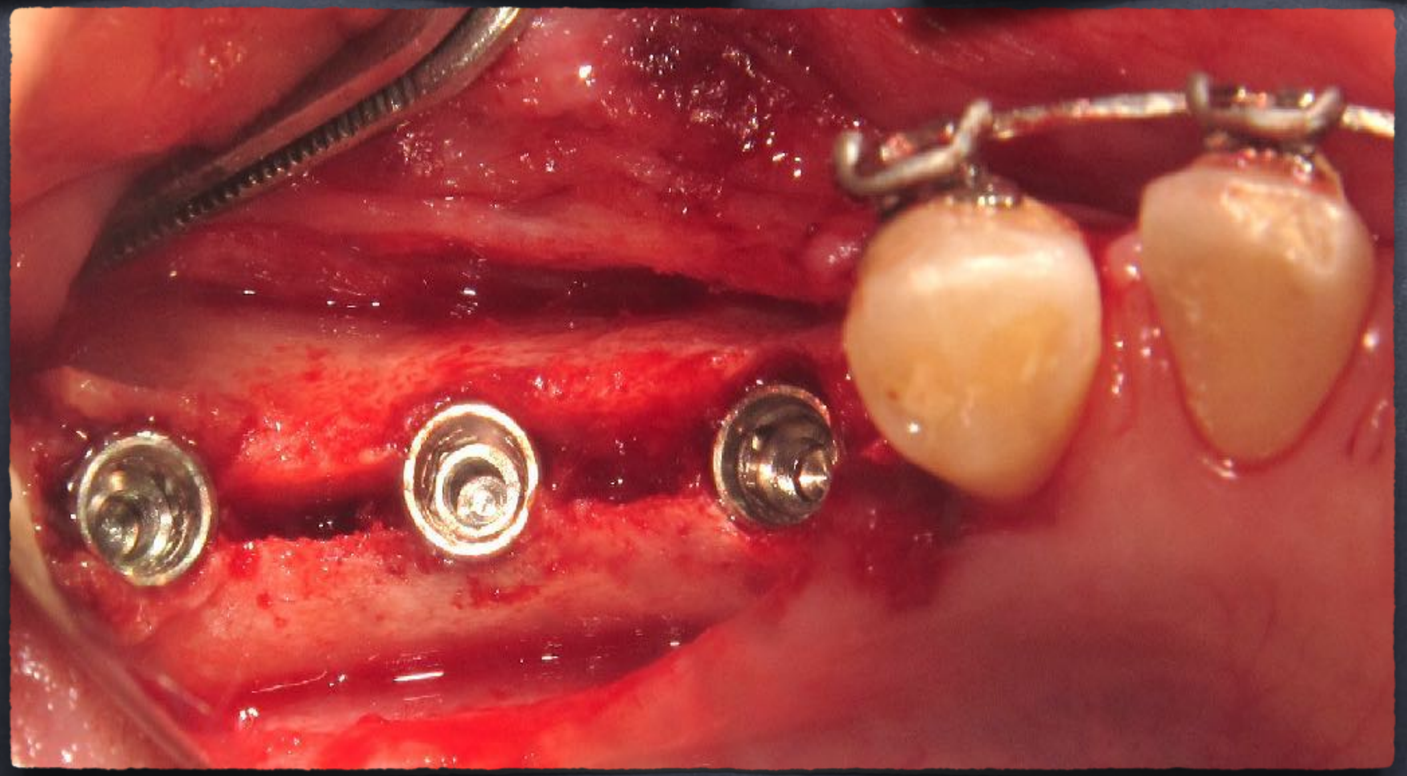


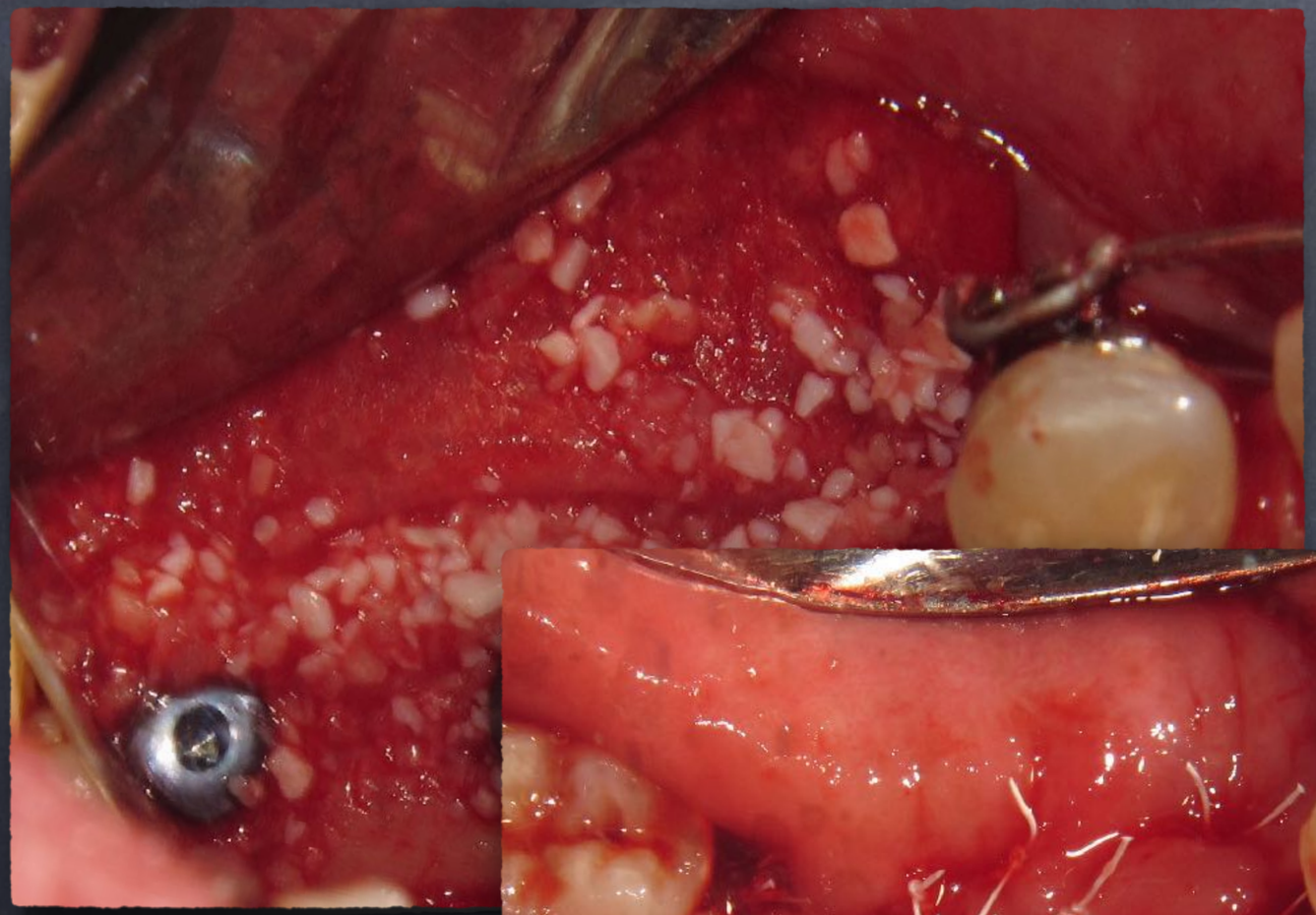
Teresa

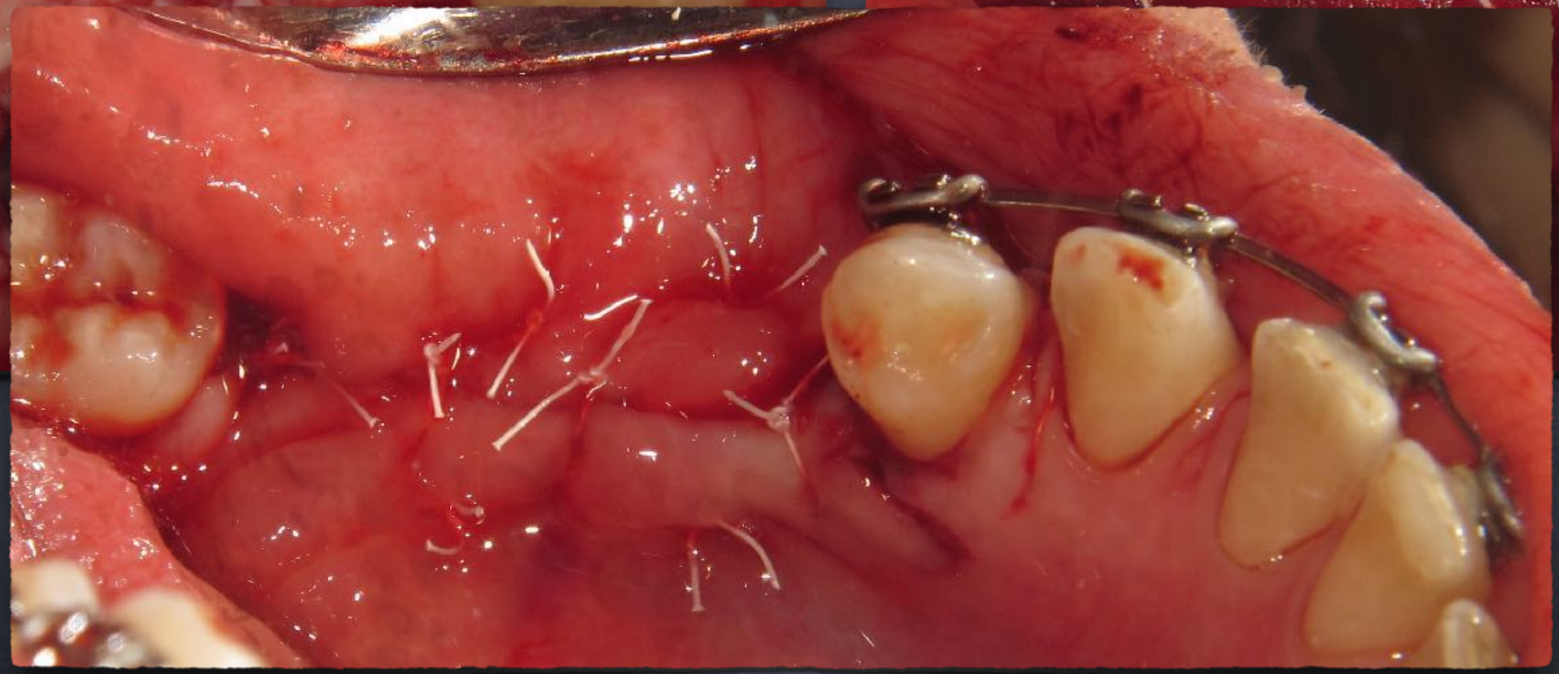
No significant medical history

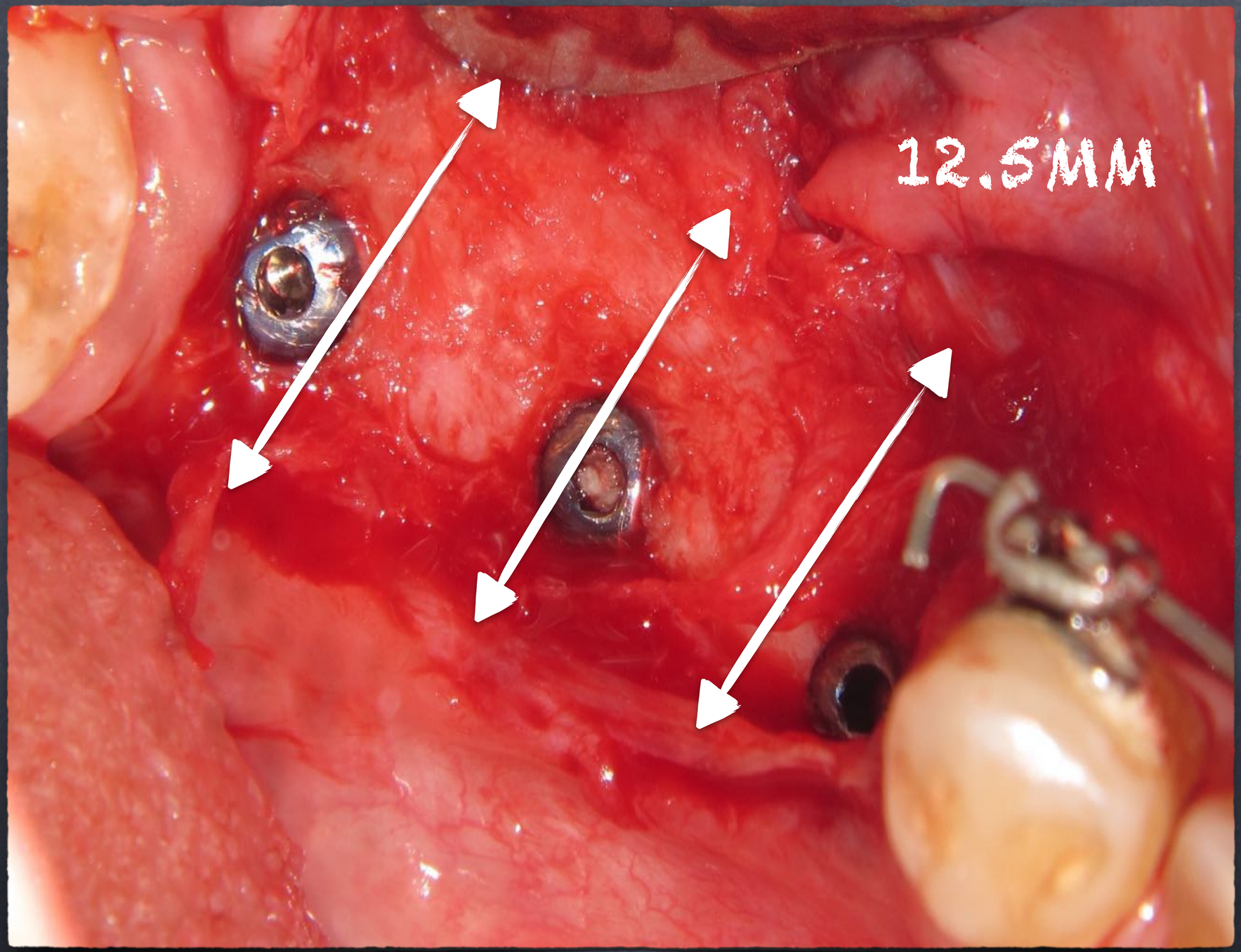
Several failed implants grafting attempts

“I can only eat soft food and soup”

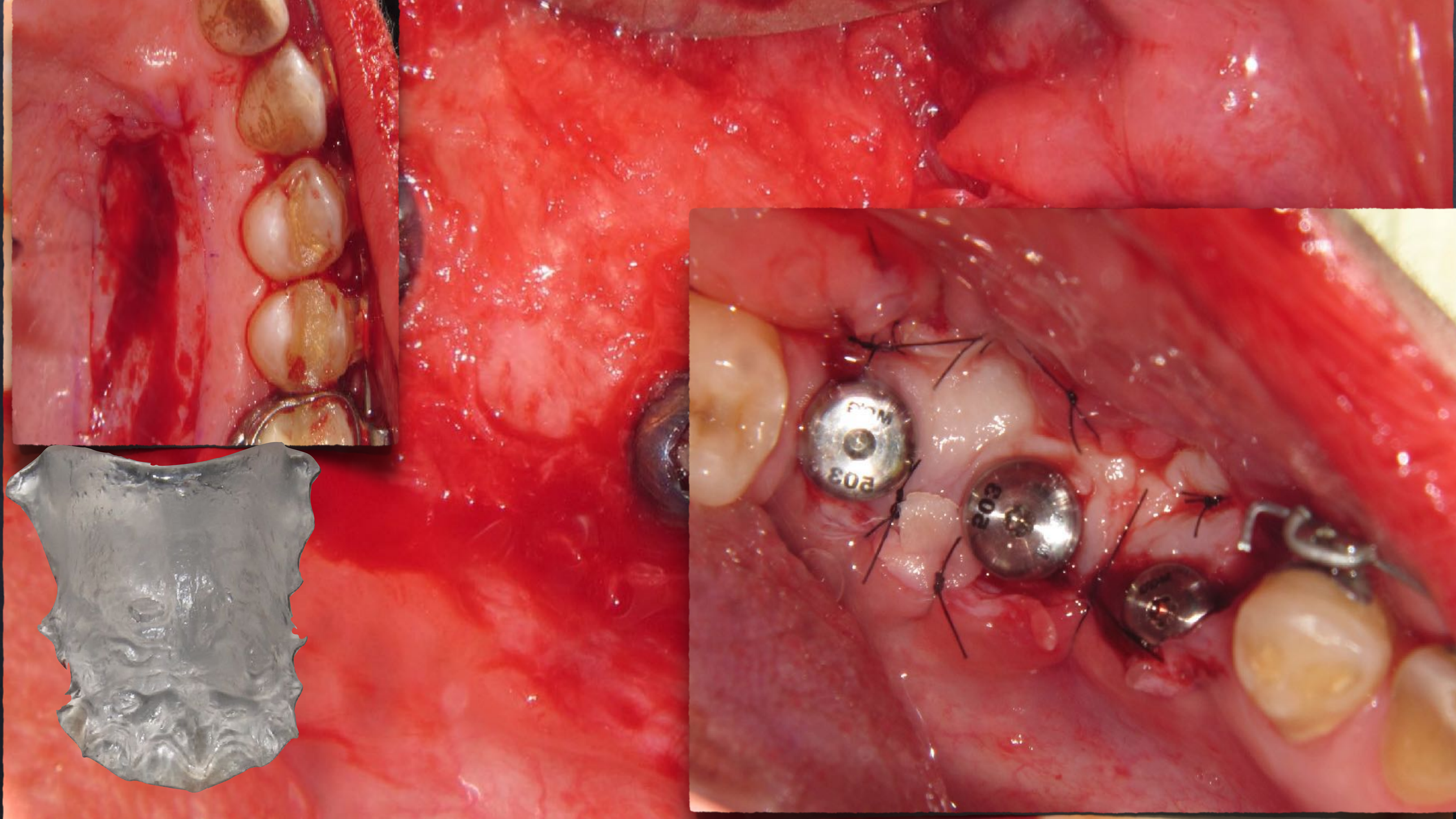


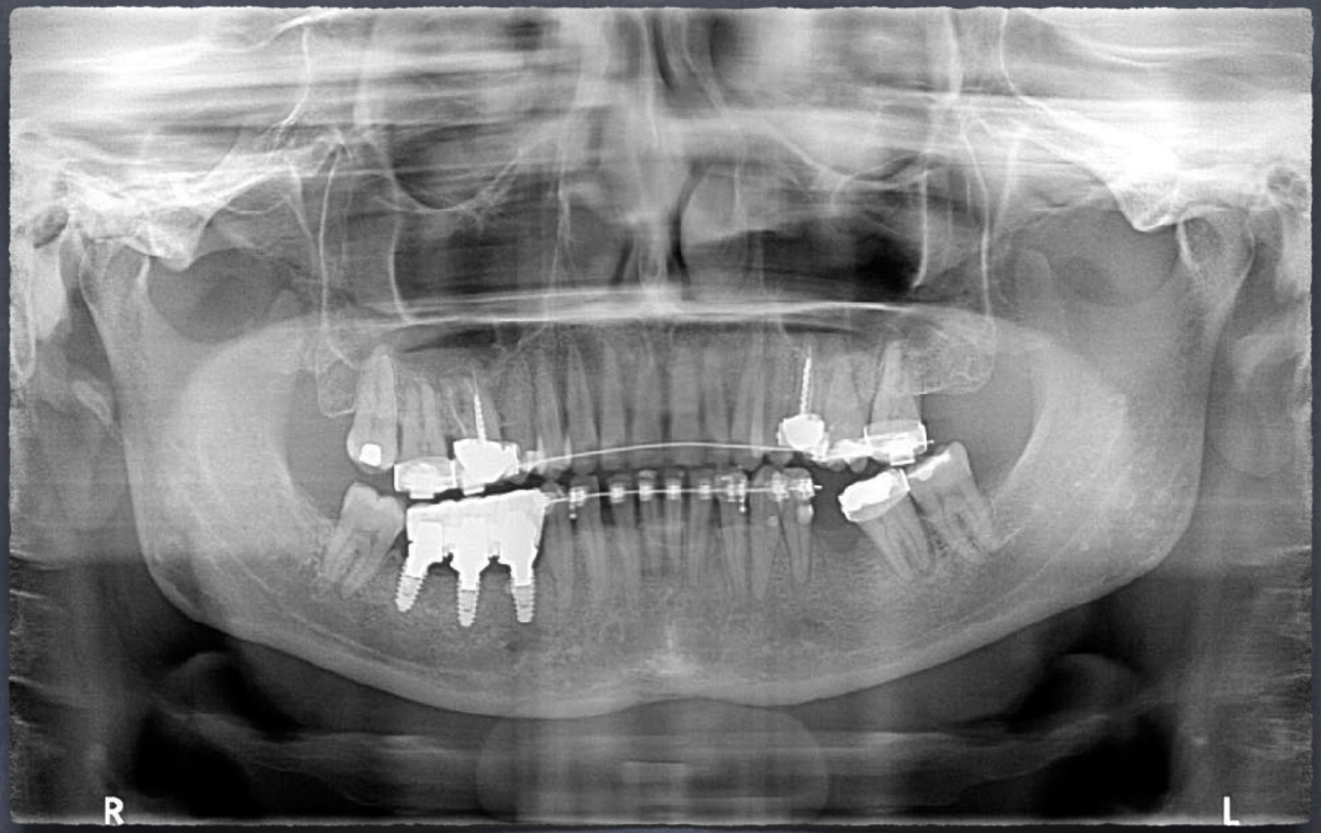





12.5MM

FGG



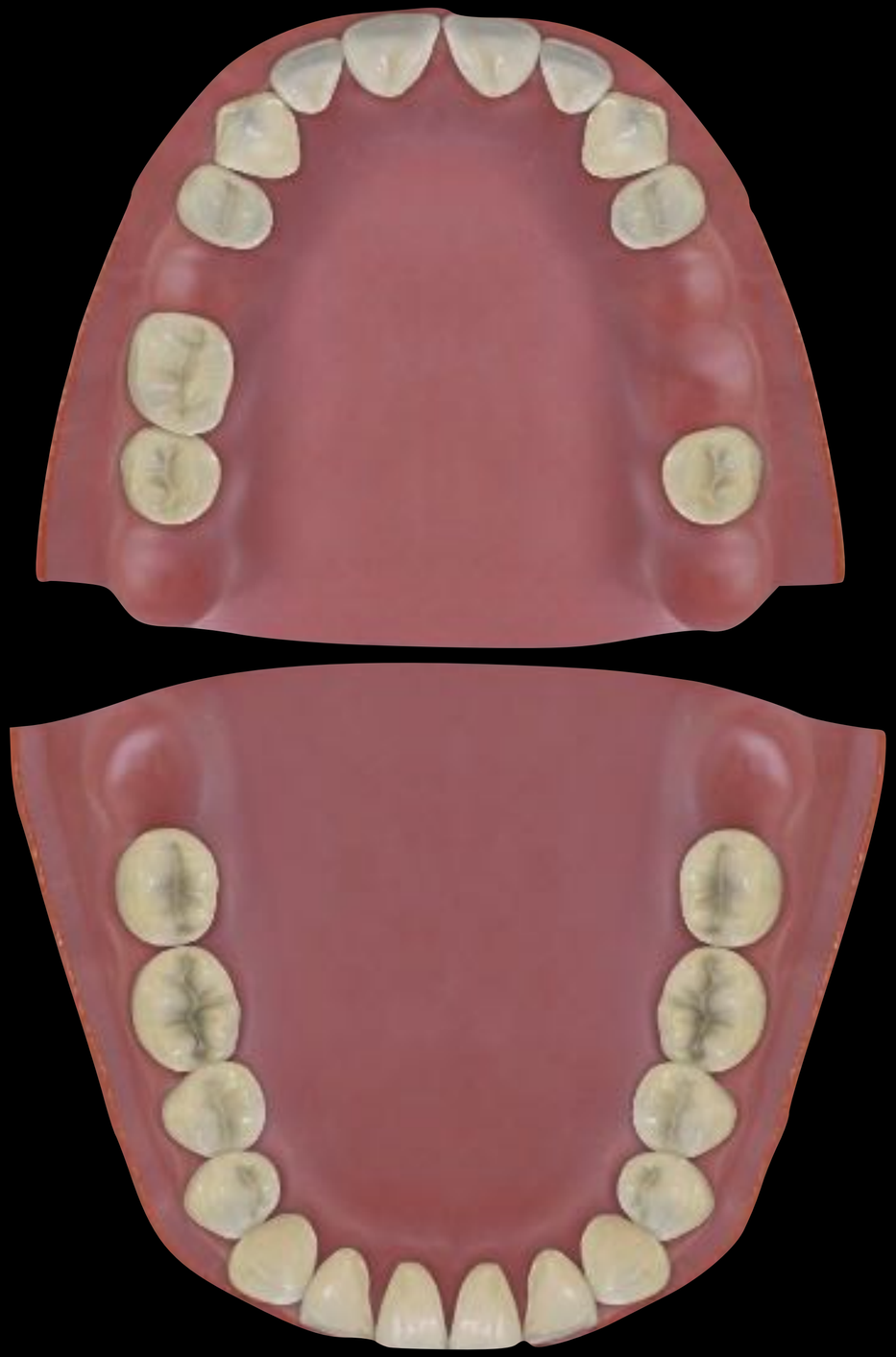

R
L

Tom

Firefighter

Desires quick solution

to fractured and missing teeth



Treatment Options

Removable Parital Denture

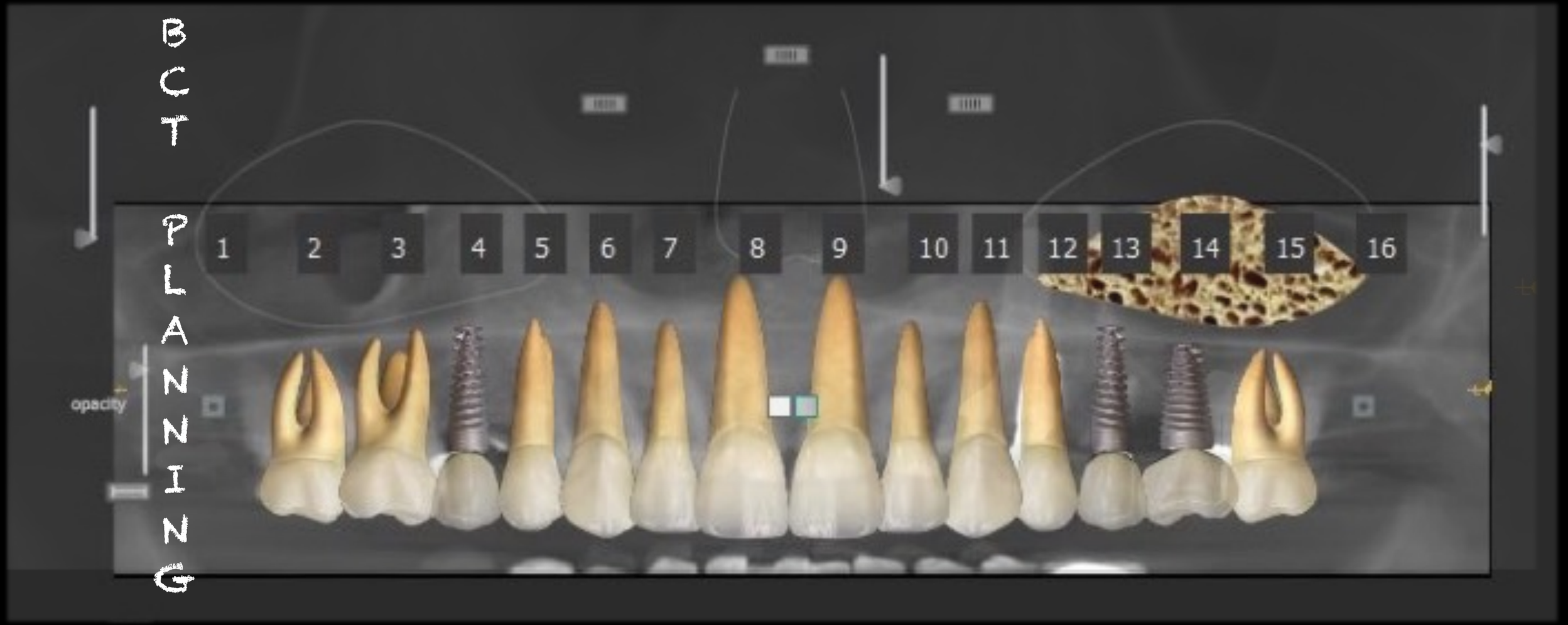
Fixed Parital Denture

Implants

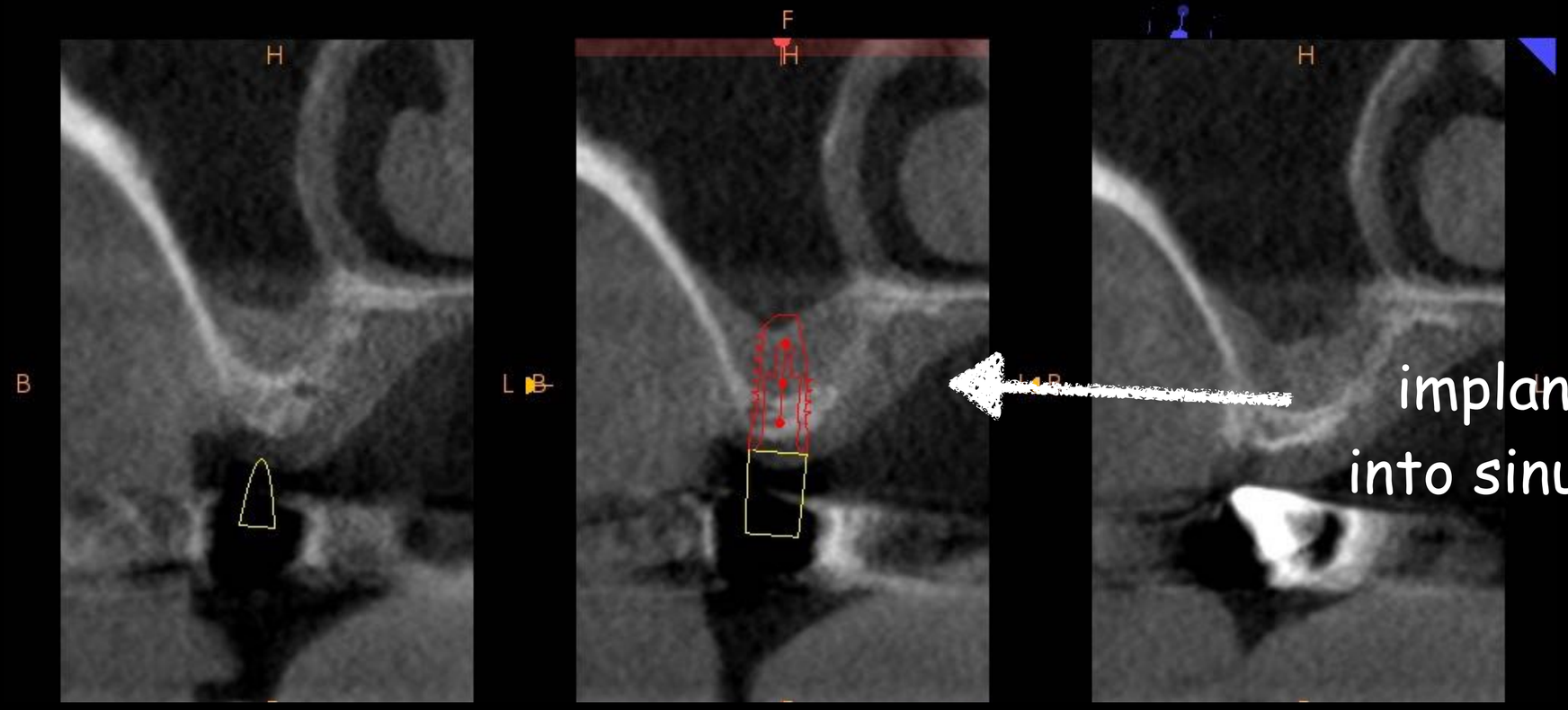
Treatment Plan	Time
•Ext's + Graft	4 months
•Sinus Augmentation UL	4-6 months
•Implants	3-4 months
•Guided tissue regenration	3-4 weeks
•Restorations	2-4 weeks

Estimated length of treatment = 10-14 months

CBCT PLANNING

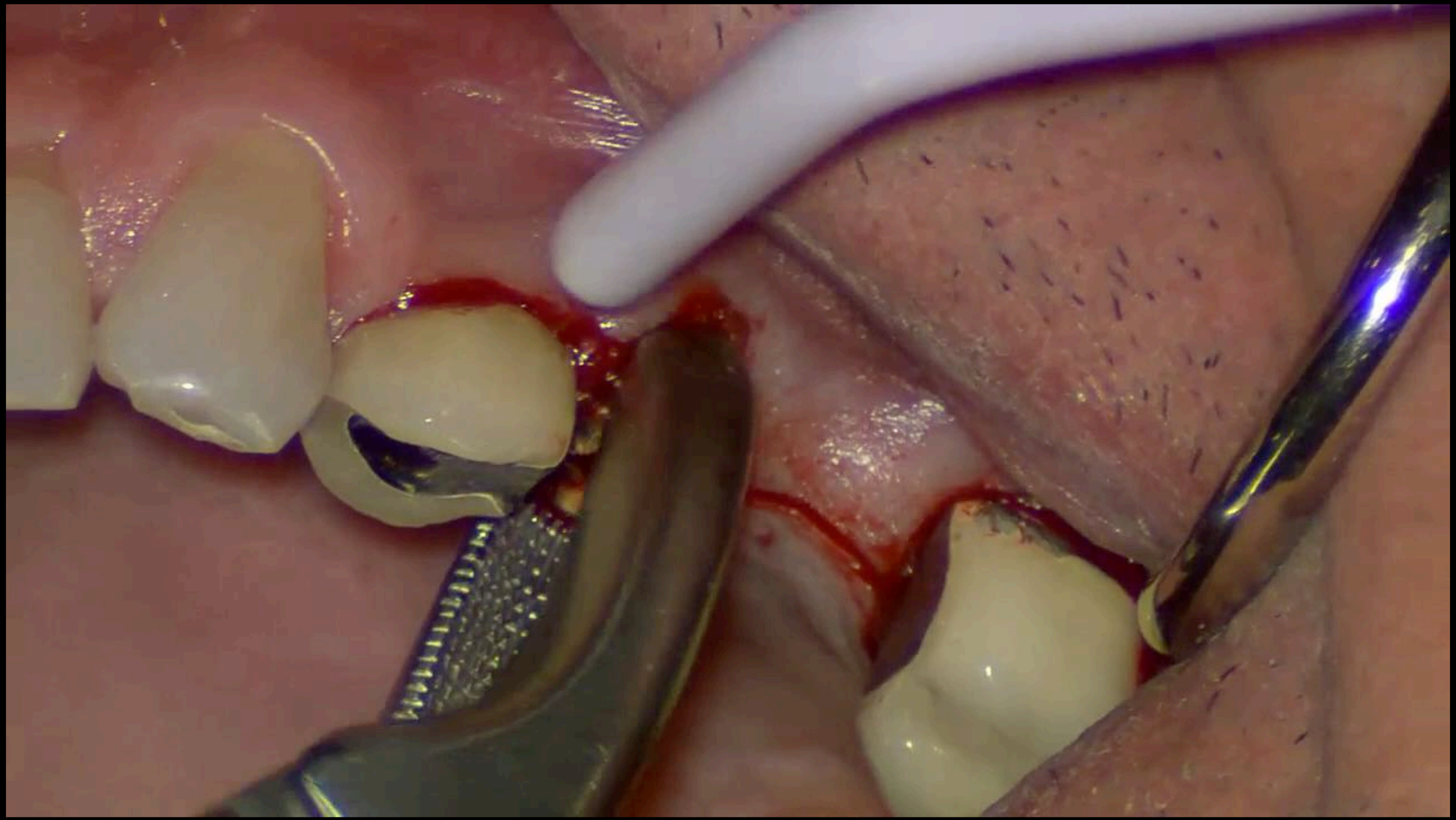


CBCT PLANNING

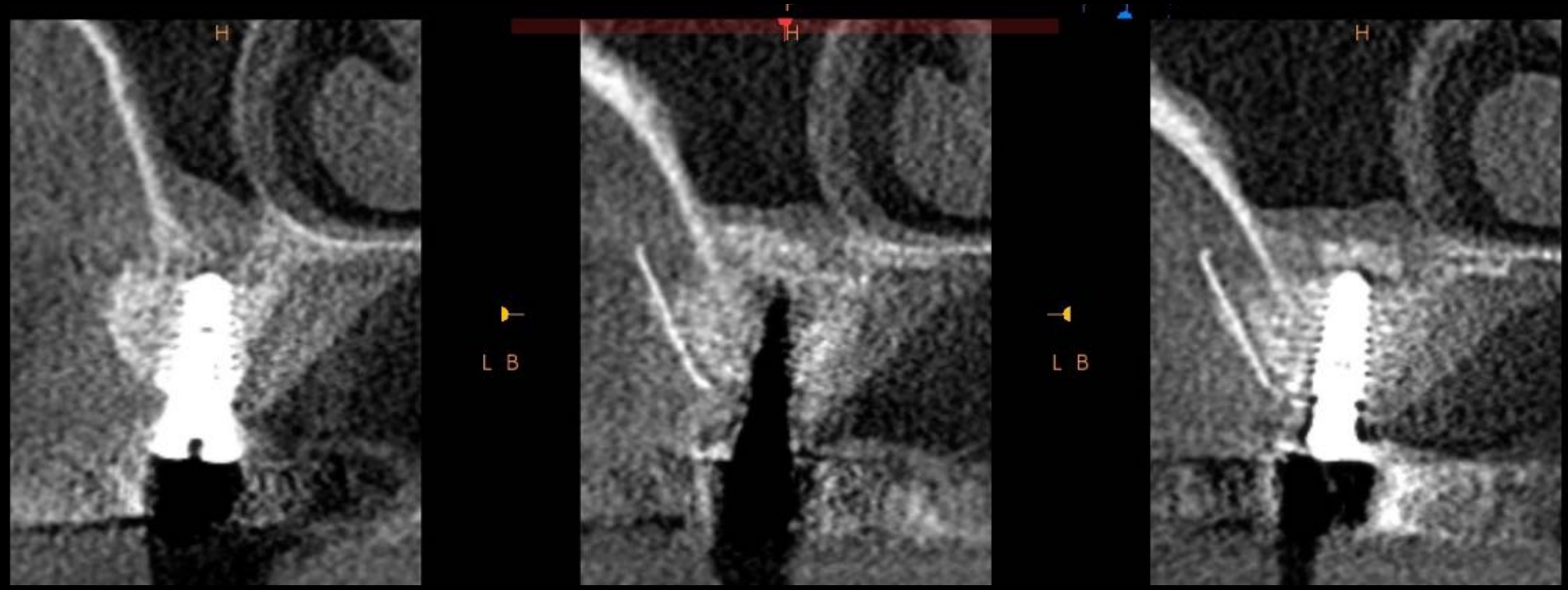


4 x 10
mock up

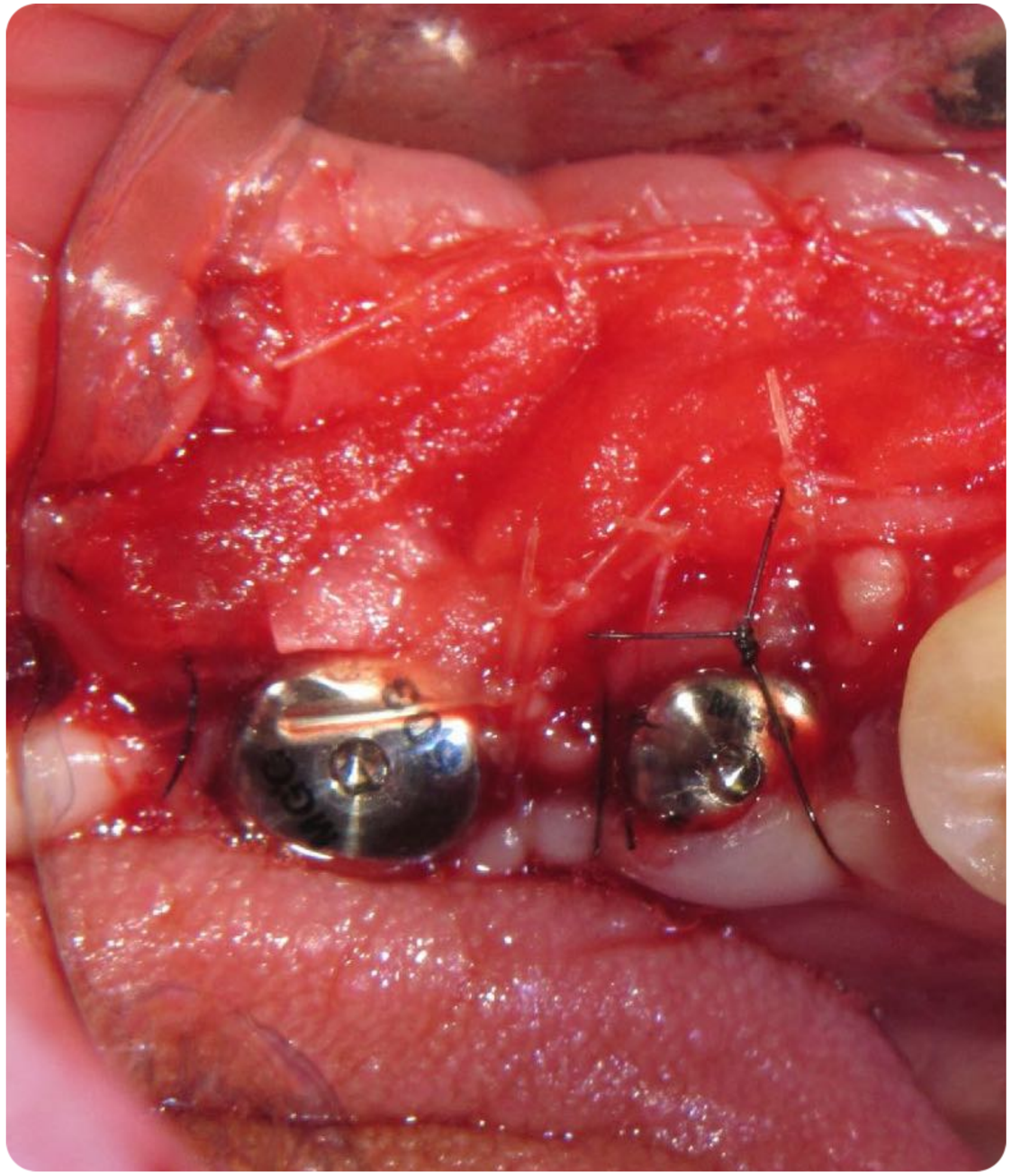
implant 7mm
into sinus cavity



Post op

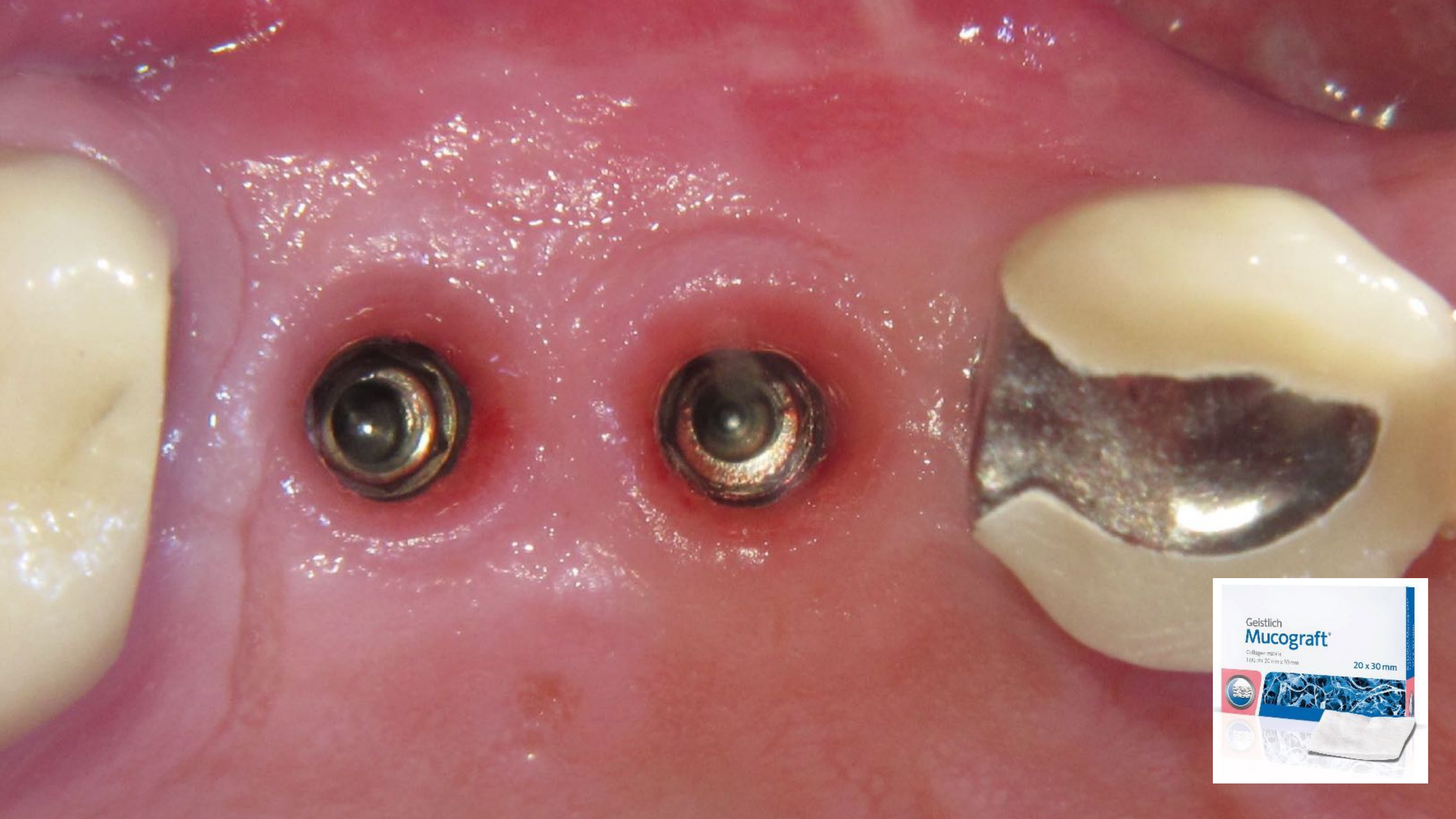


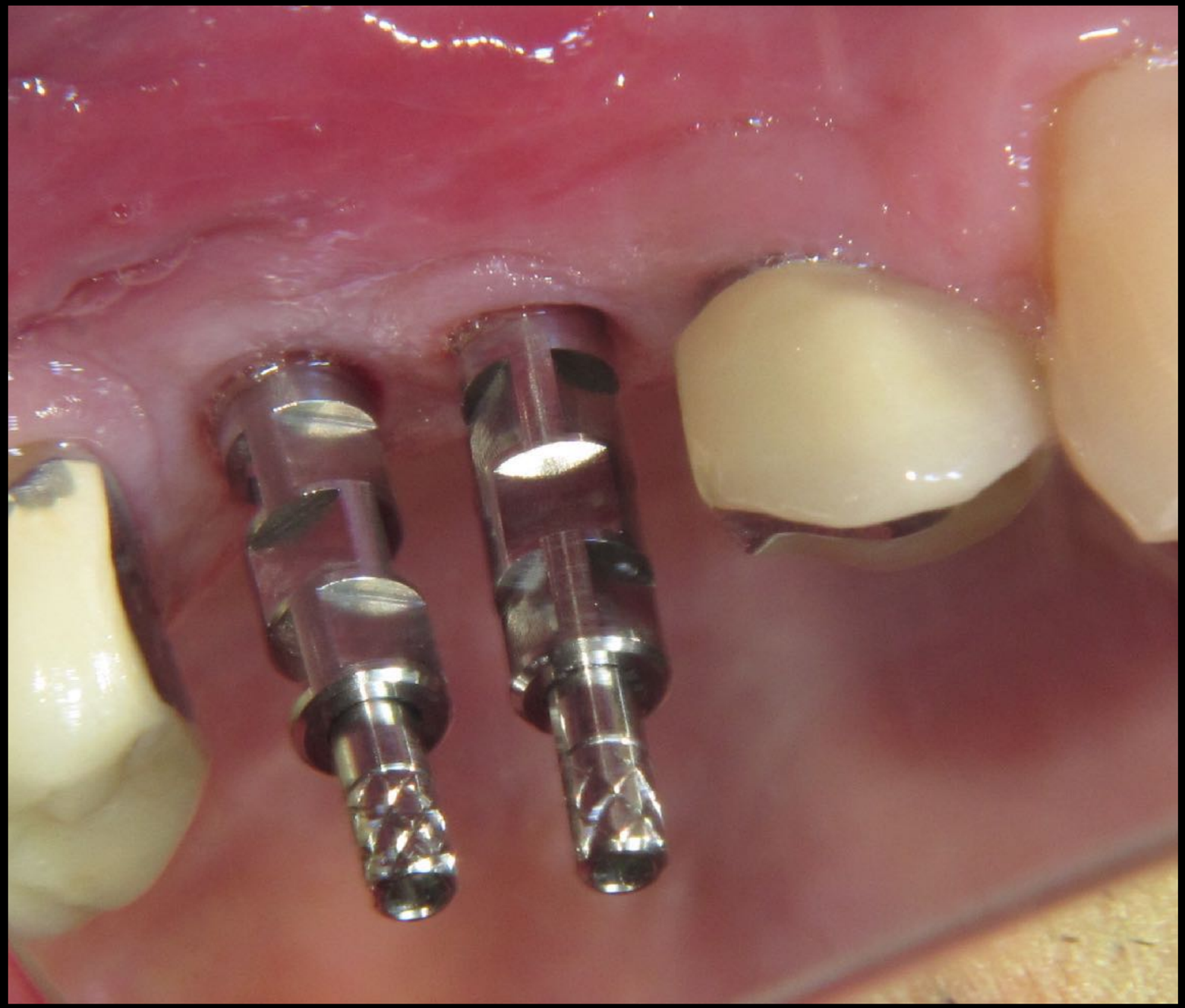

membrane
removal

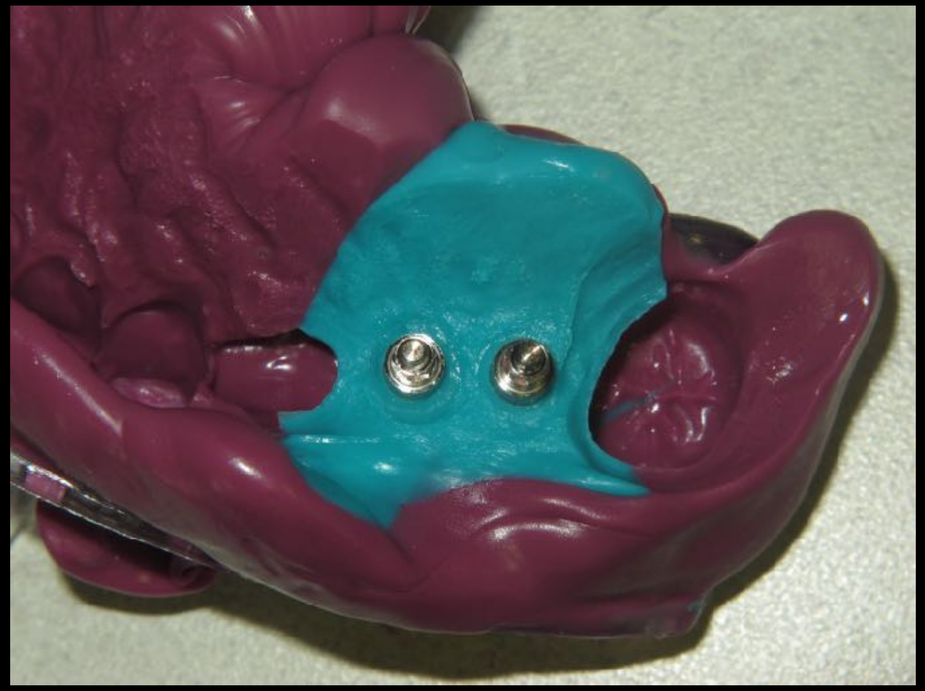



Geistlich
Mucograft®
20 x 30 mm

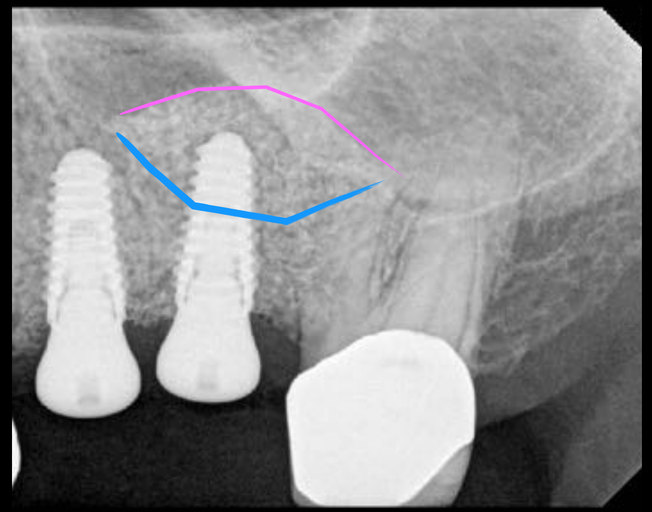

Fibrin Glue


Geistlich
Mucograft®
20 x 30 mm





16 week post op



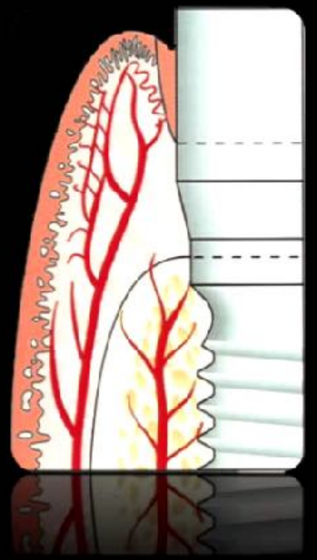
Natural Teeth vs Implants
Biological Comparisons

- Periodontal Ligament

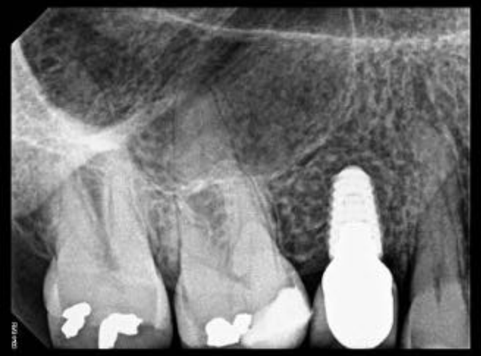
- Vascular Supply
very few vessels
were found in the connective tissue near
the transmucosal portion of the
implant. This limited blood supply makes the
peri-implant tissues less resilient to both mechanical
and microbiological insults.

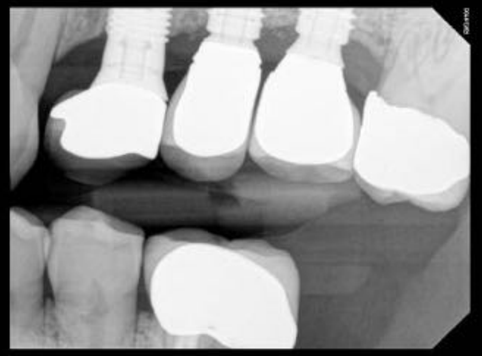
- Connective Tissue

- Junctional Epithelium



6 month post op





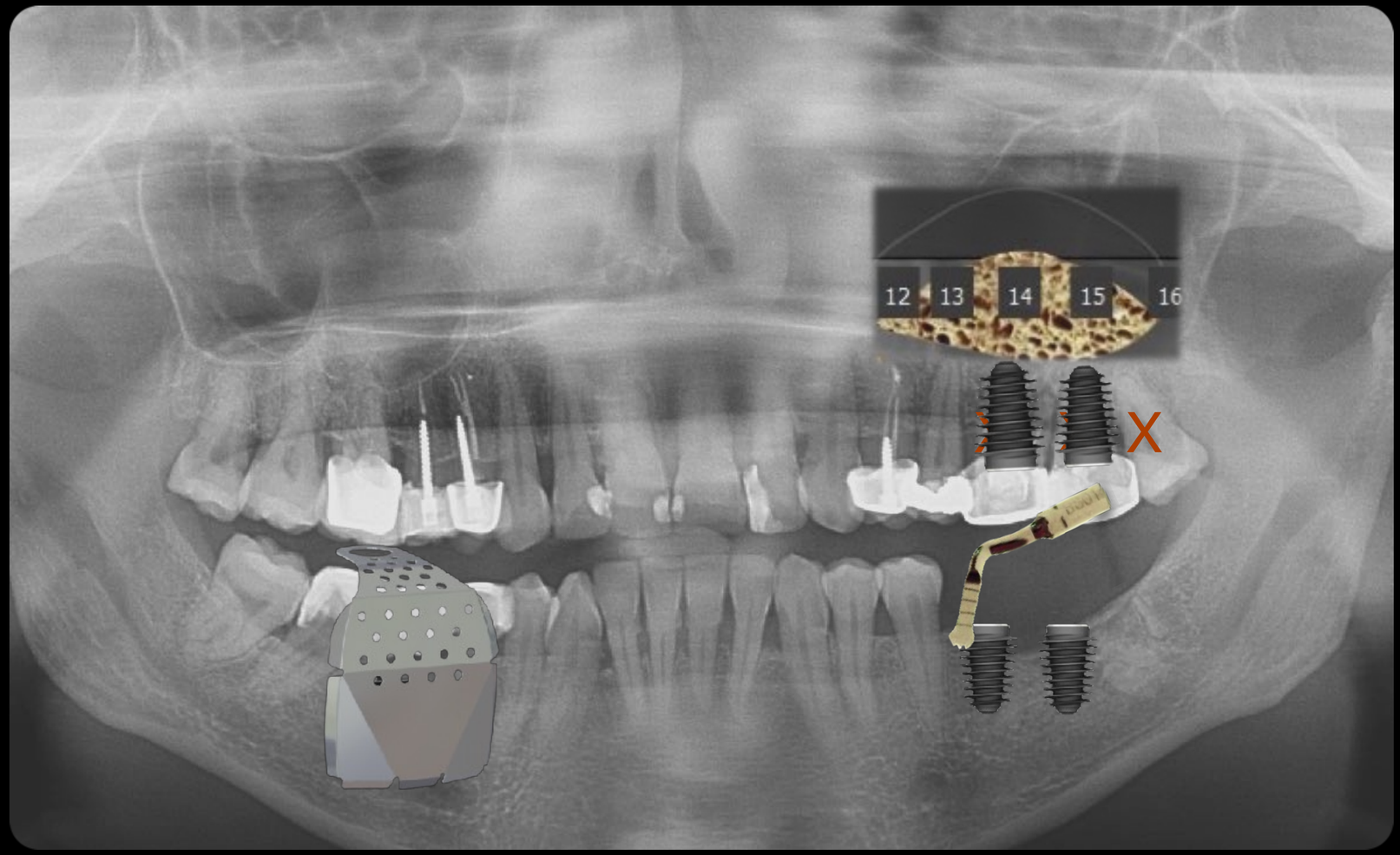
Zana

Very unhappy with her smile

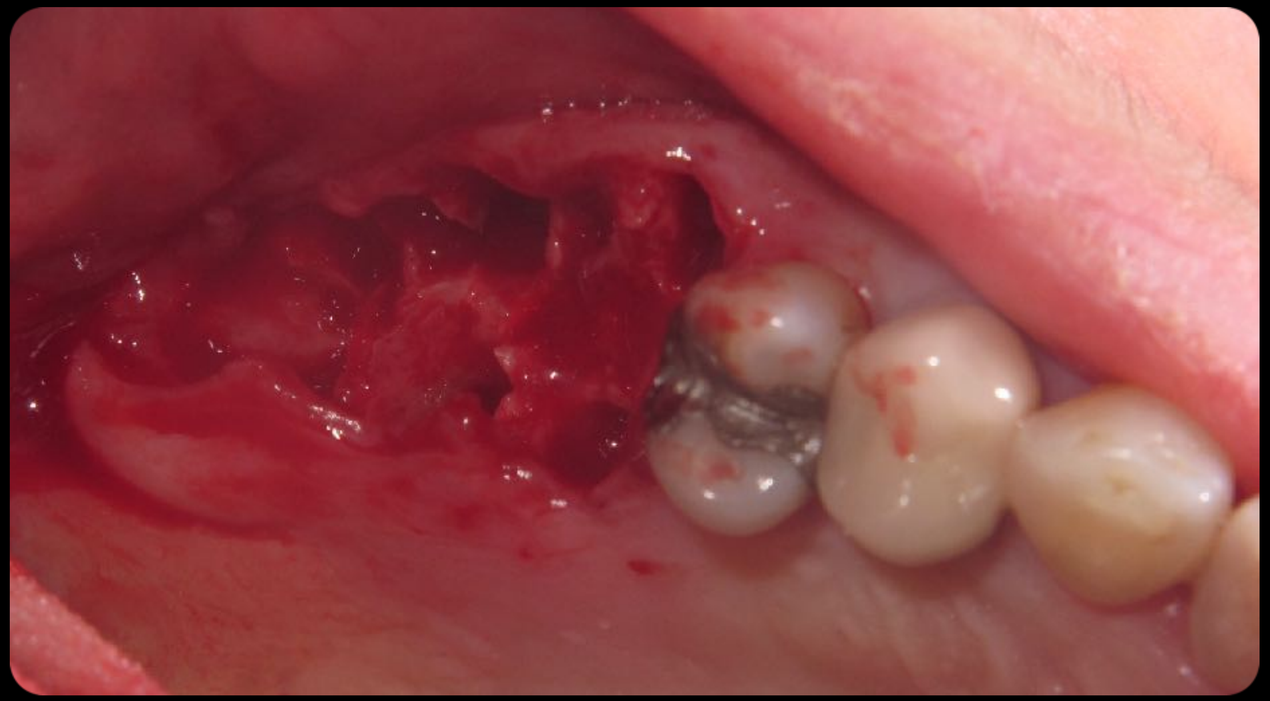
Loose and painful teeth

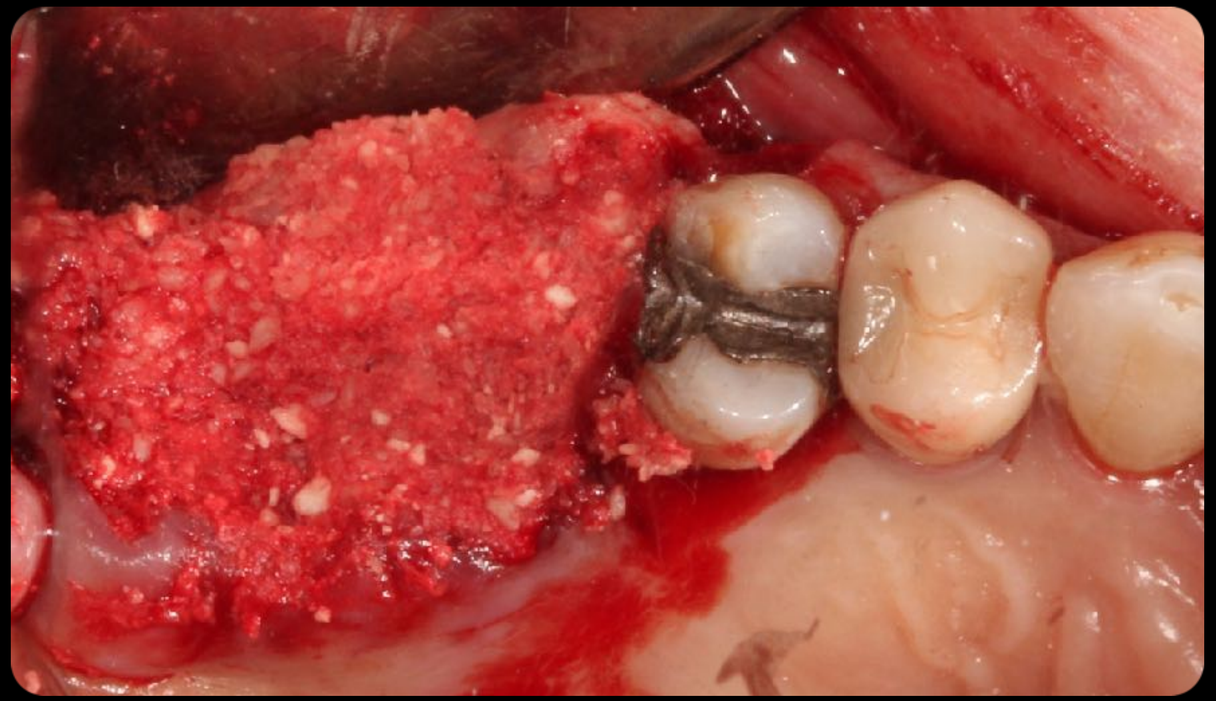
Building up food under her fixed partial denture

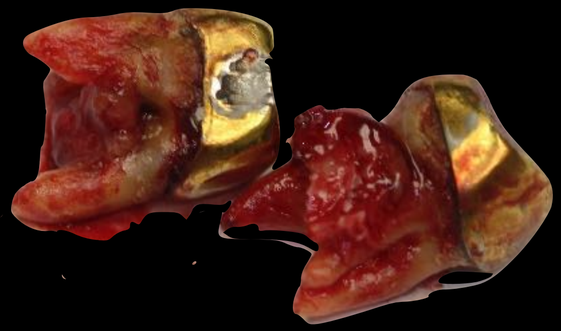
Treatment Plan	Time
•Ext #14,#15#16	1 visit
•Dental Caries	3 visits
•Perio S/R	2 visits
•Crowns functional/ cosemtic	3 visits
•UL Sinus Augmentation	2 visits
•GBR #30	2 visits
•Implants #14, #15, #18, #19,#30	2 visits



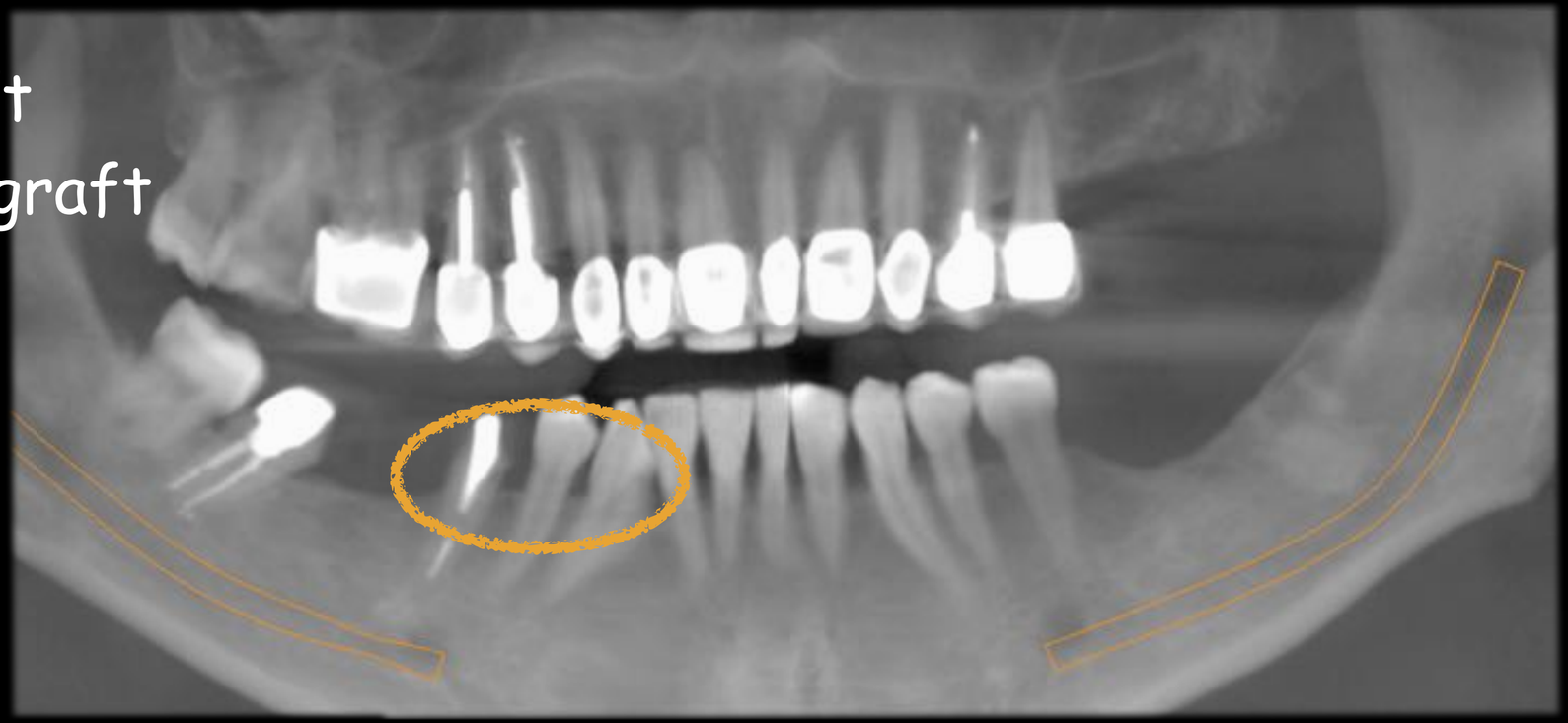
Estimated length of treatment =
15 visits 1.5 years

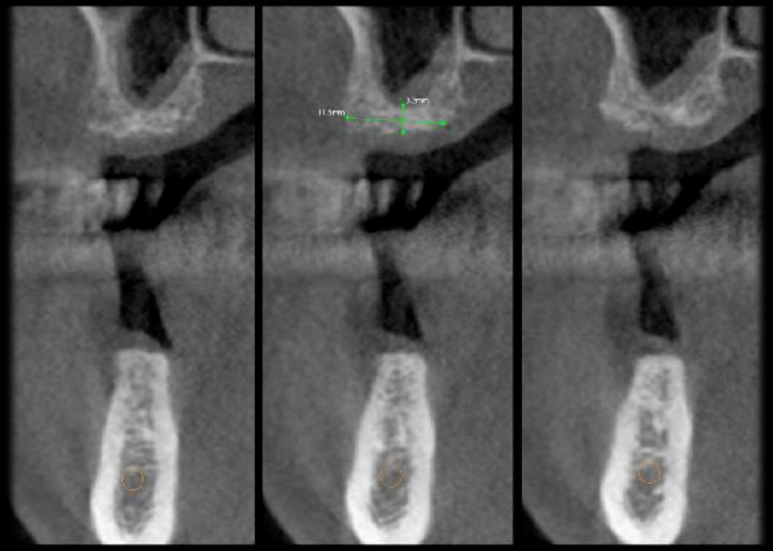


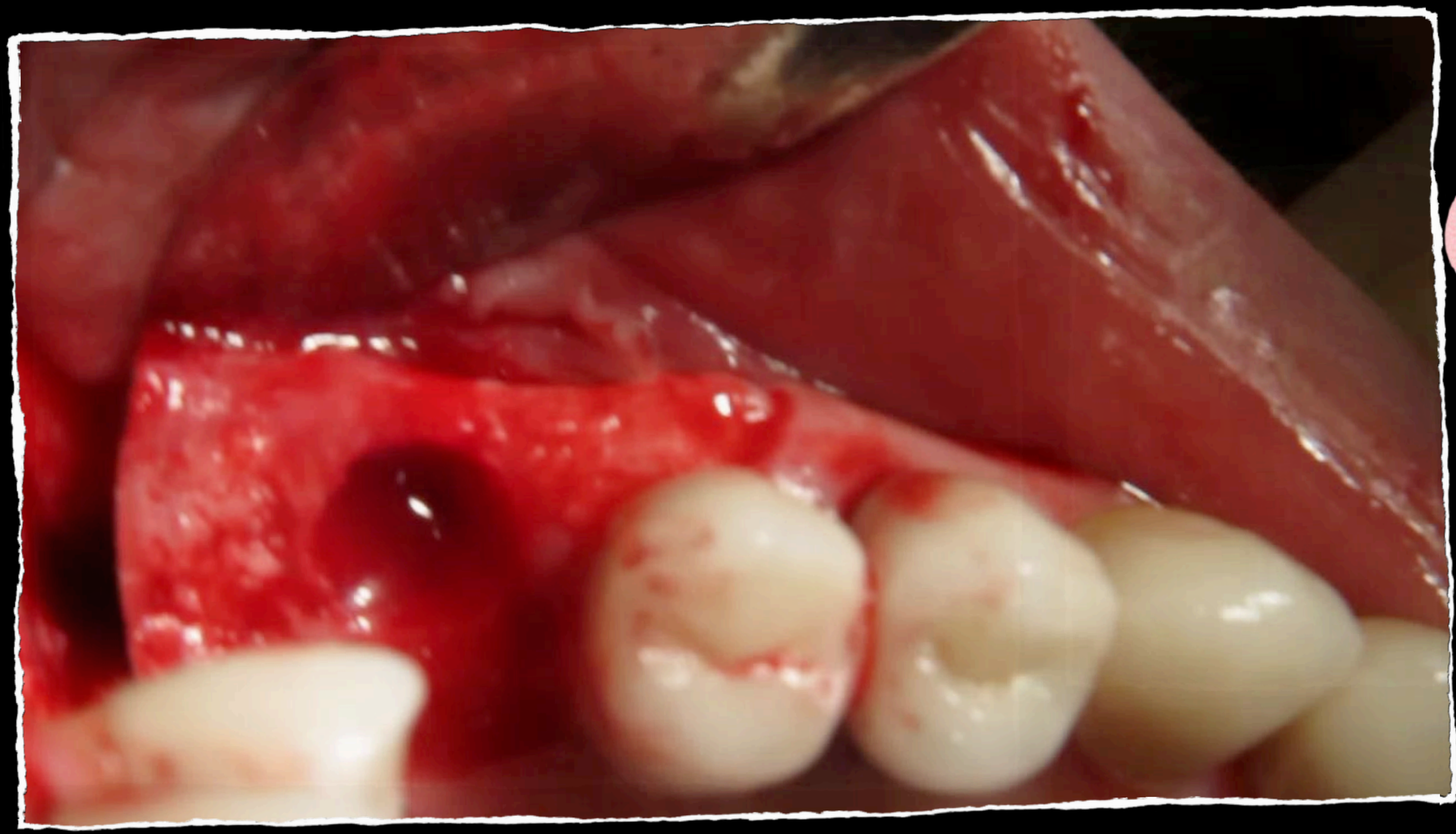


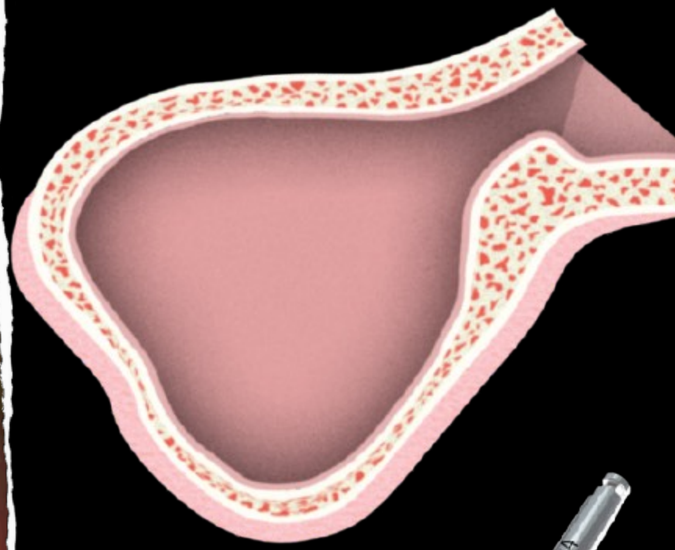


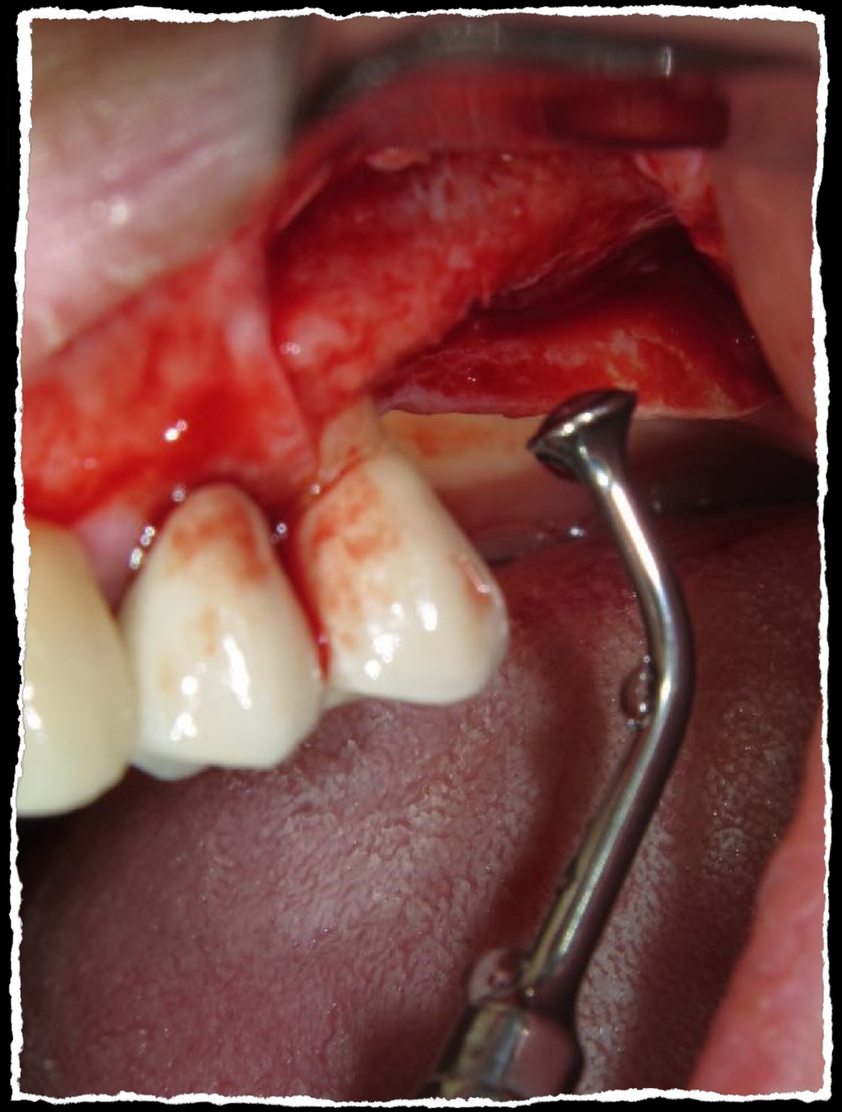
Upper Left
6 weeks post graft



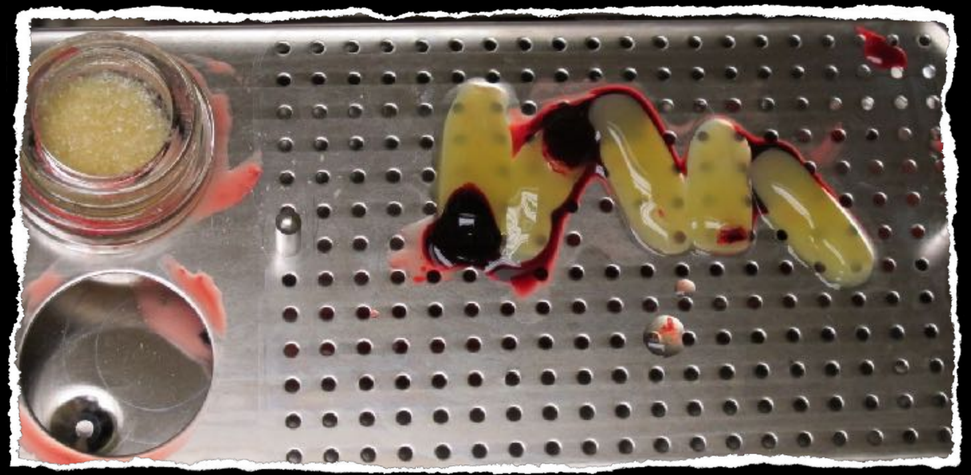


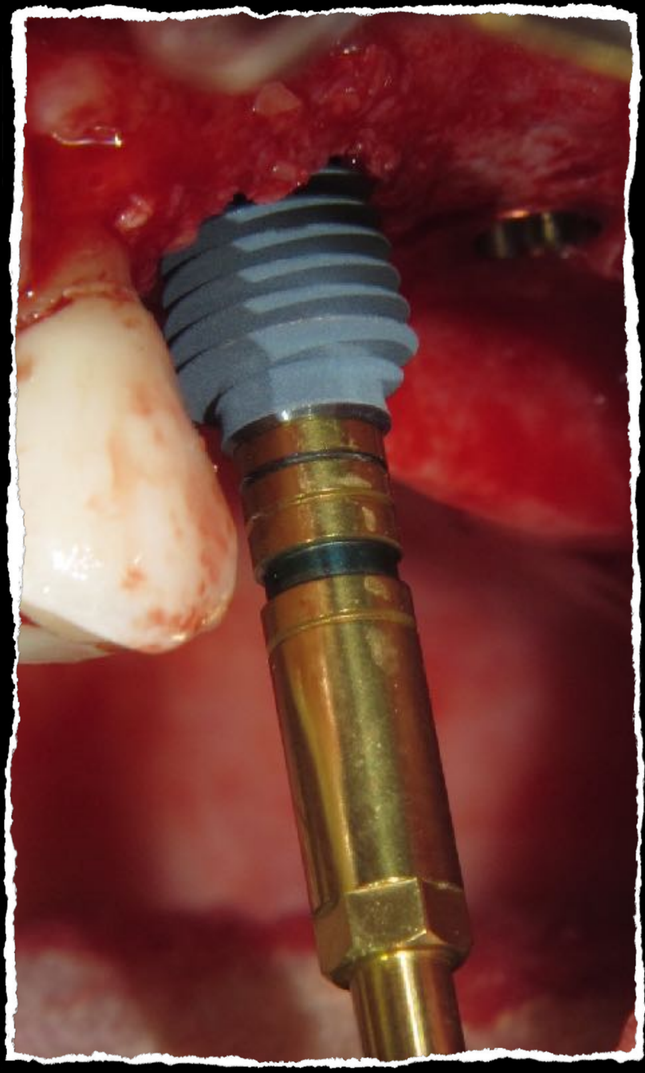


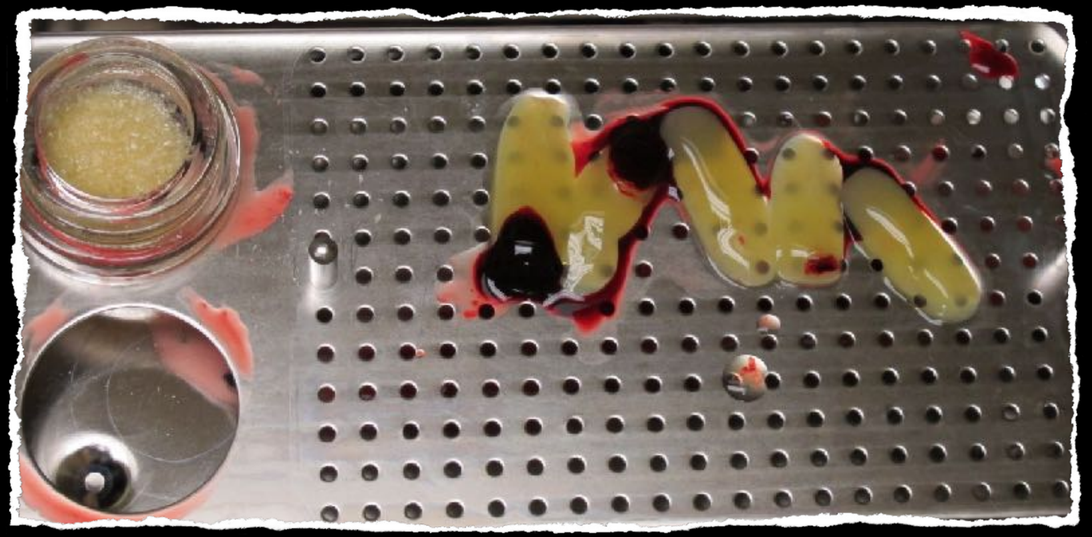




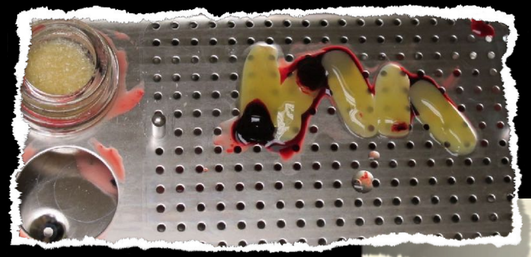
A-PRF™
Platelet Rich Fibrin





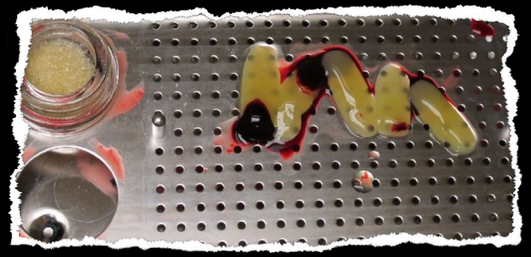



A-PRF™
Platelet Rich Fibrin
i-PRF™
A-PRF™
10 ml
STERILE R
9 ml

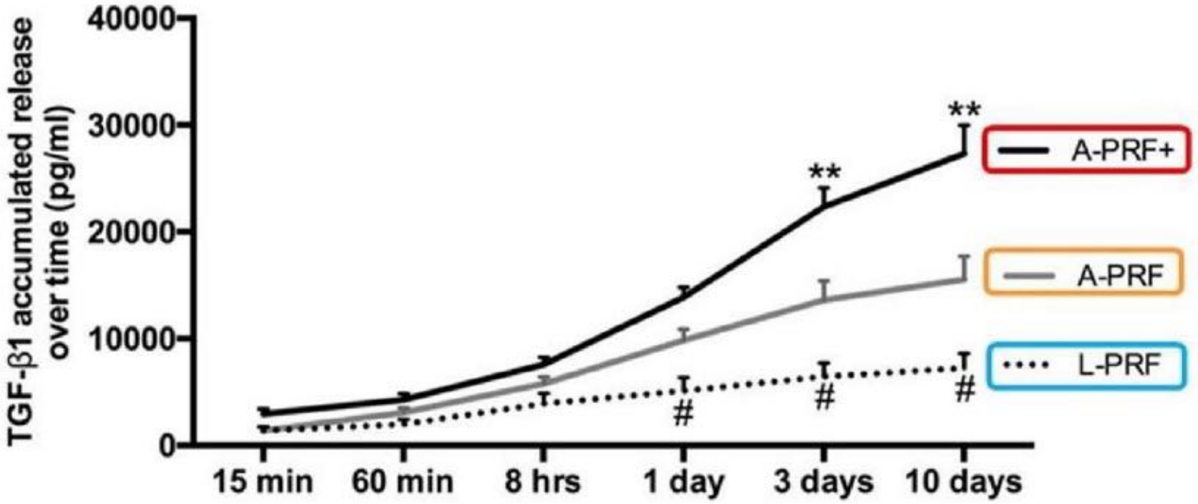


Platelet Rich Fibrin

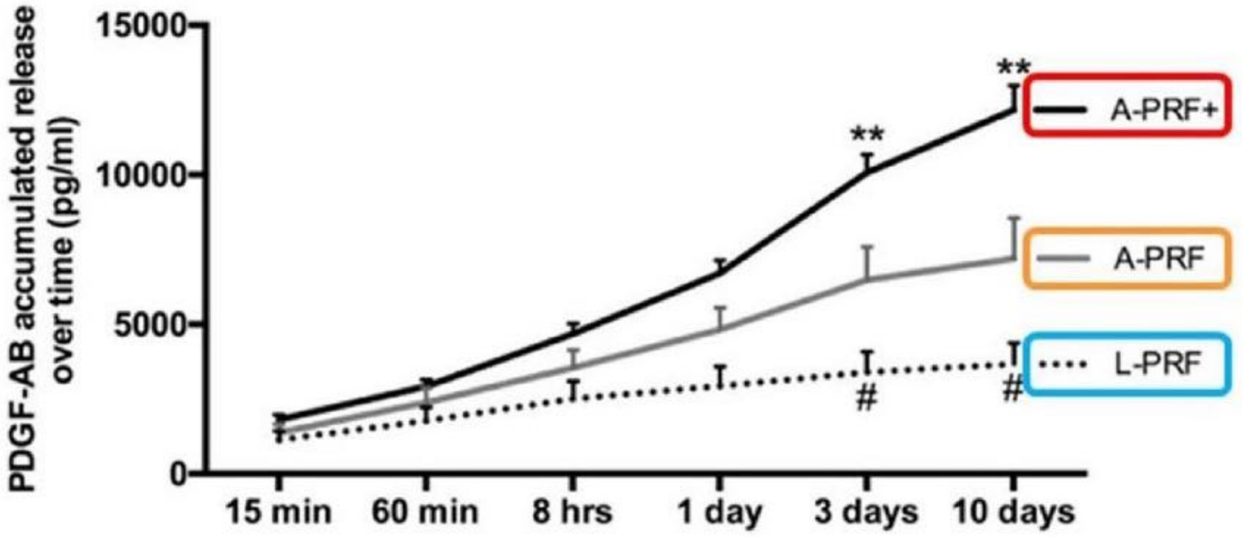
Video courtesy of Dr Howard Gluckman

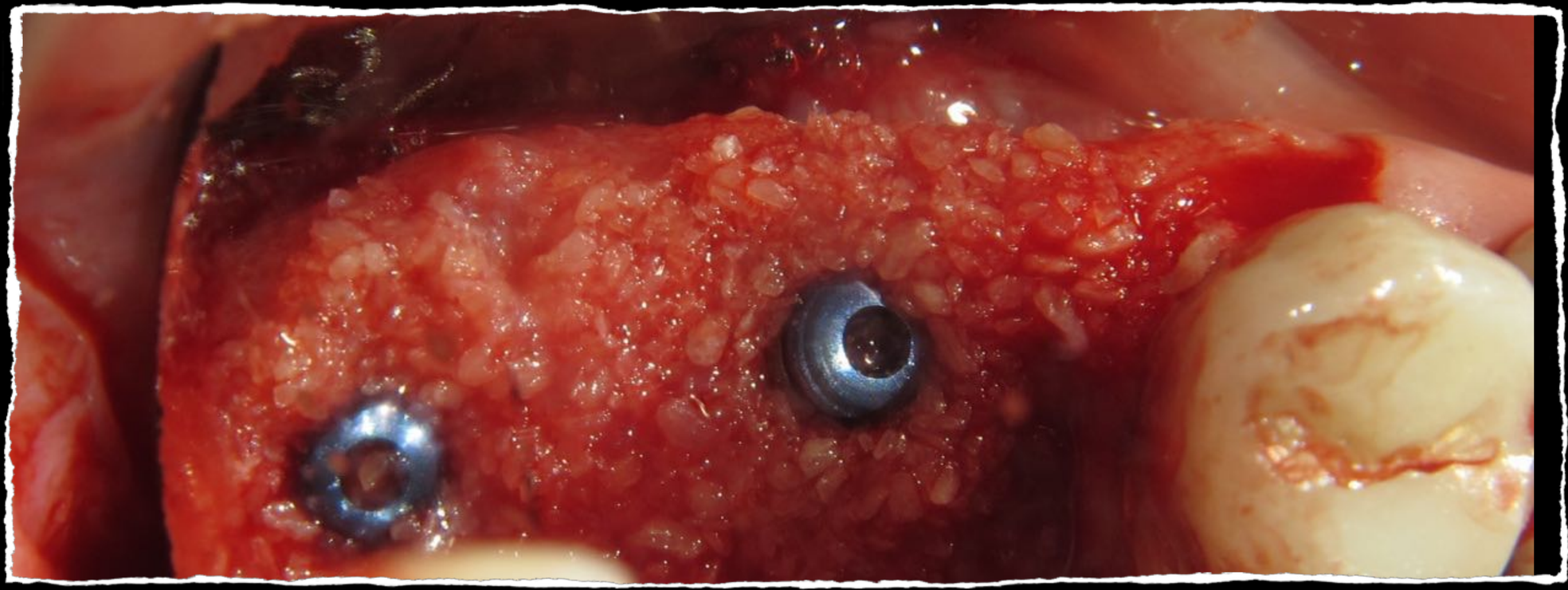


(B) TGF-β1 - sum



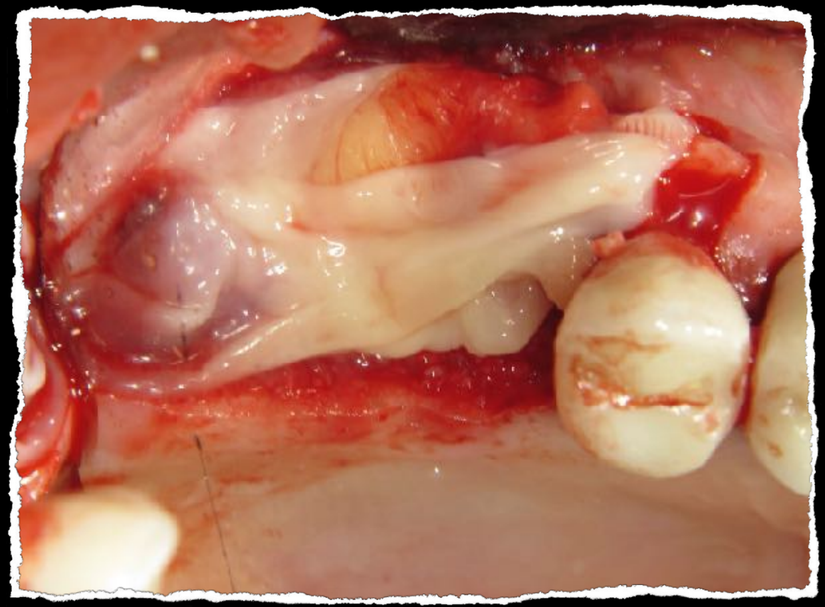
(D) PDGF-AB - sum

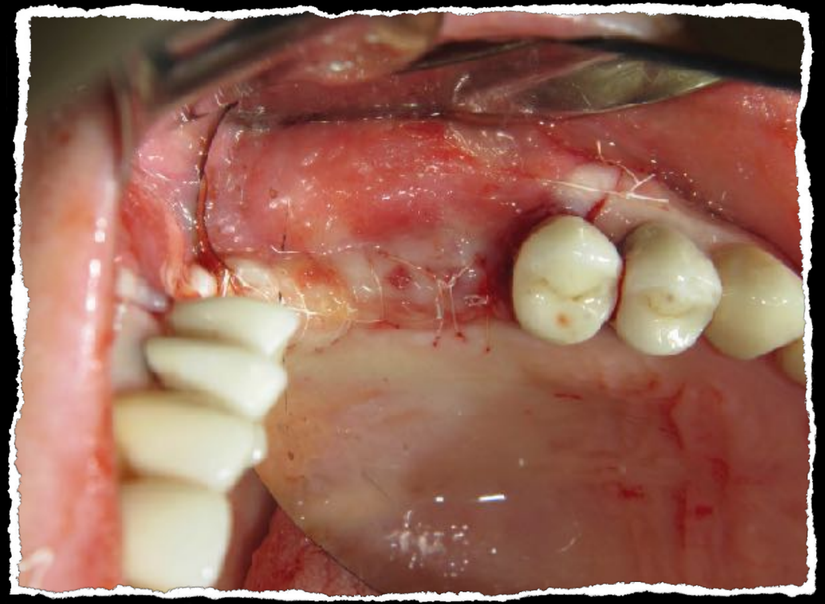




A-PRF

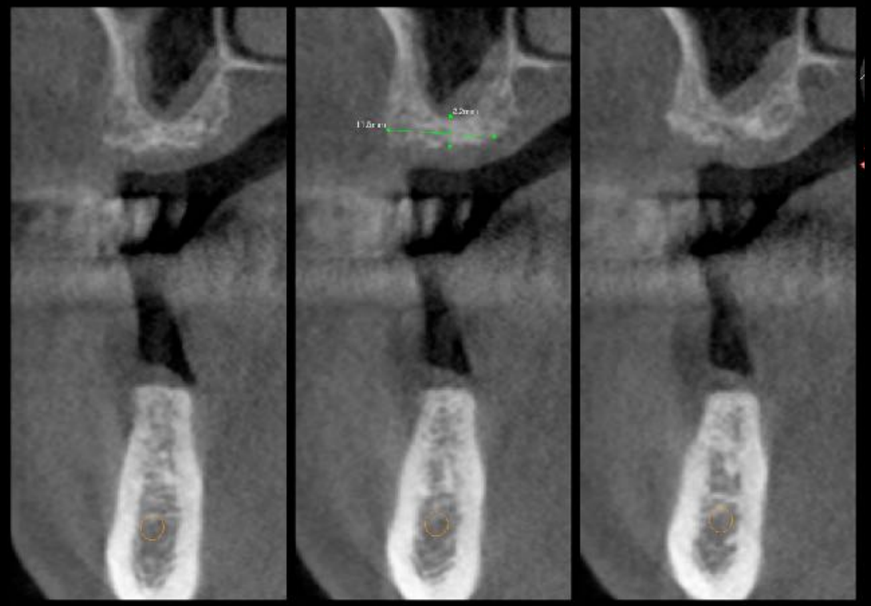
2 WEEKS
POST HEALING

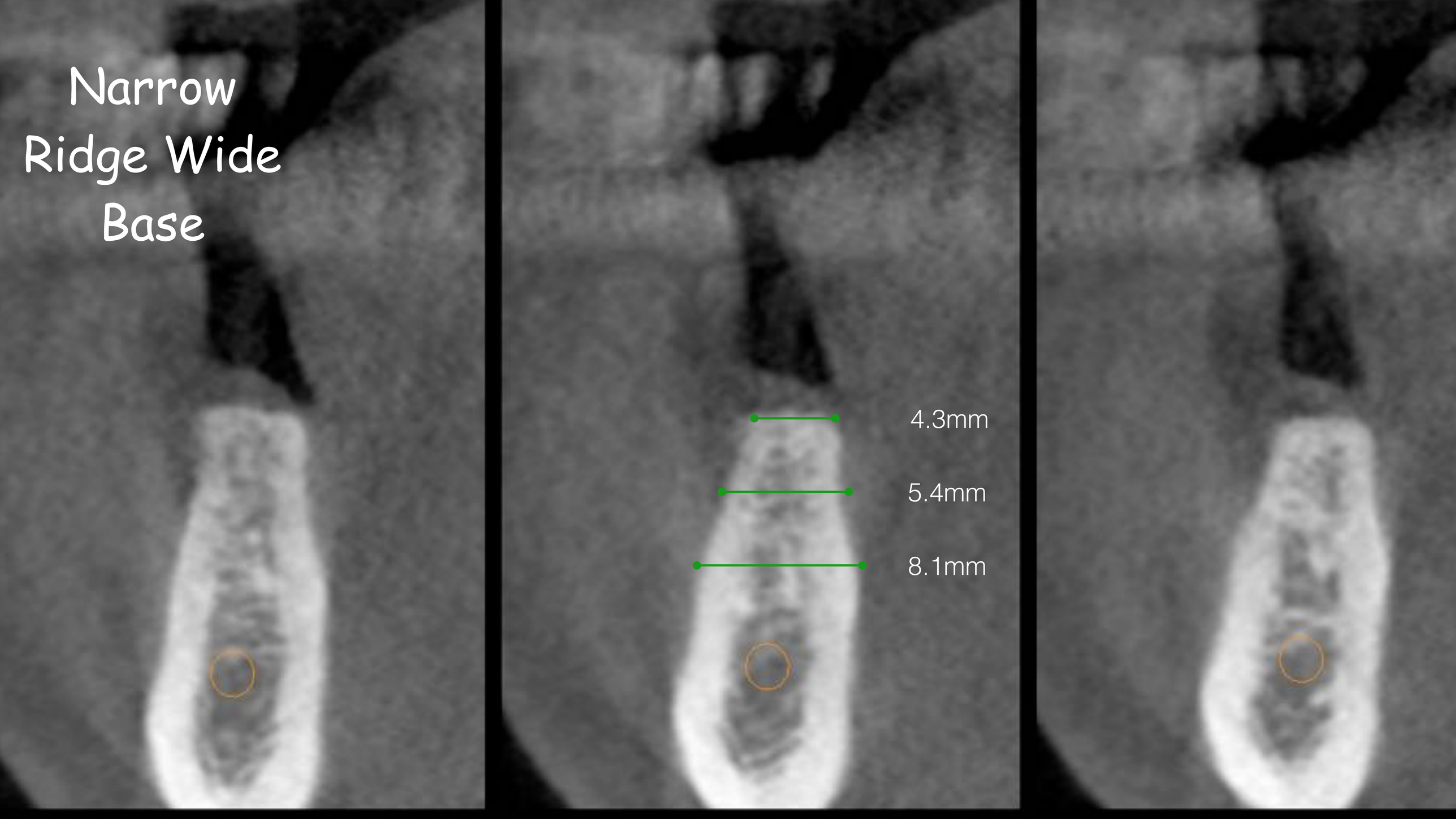




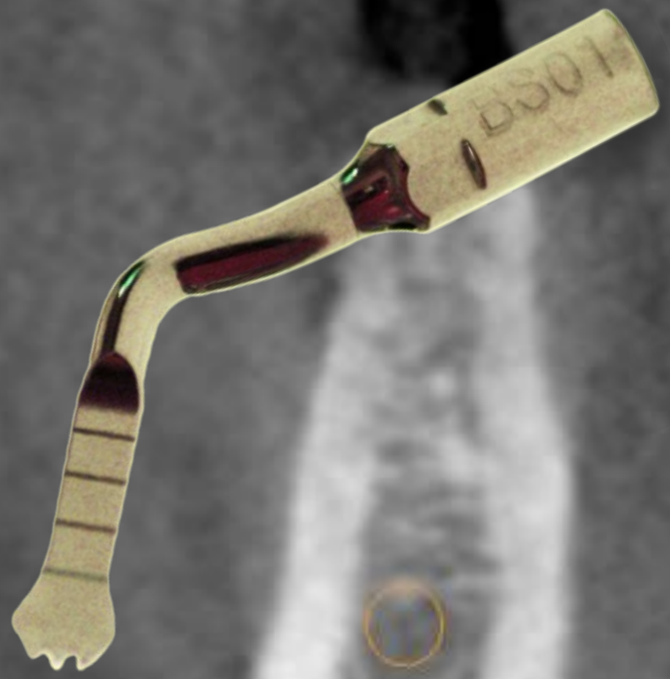
Lower left

Narrow Ridge Wide Base

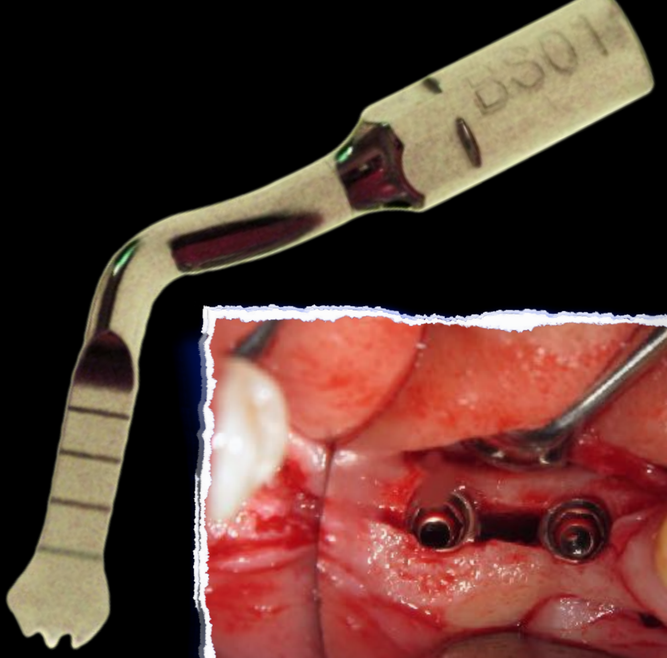


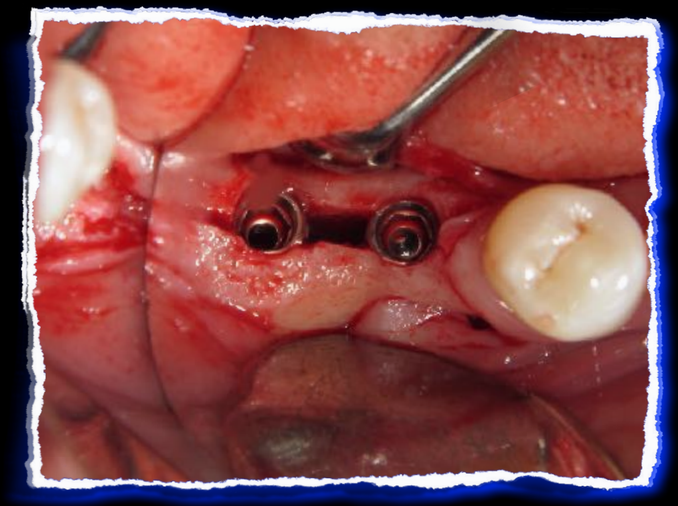

Narrow
Ridge Wide
Base
4.3mm
5.4mm
8.1mm

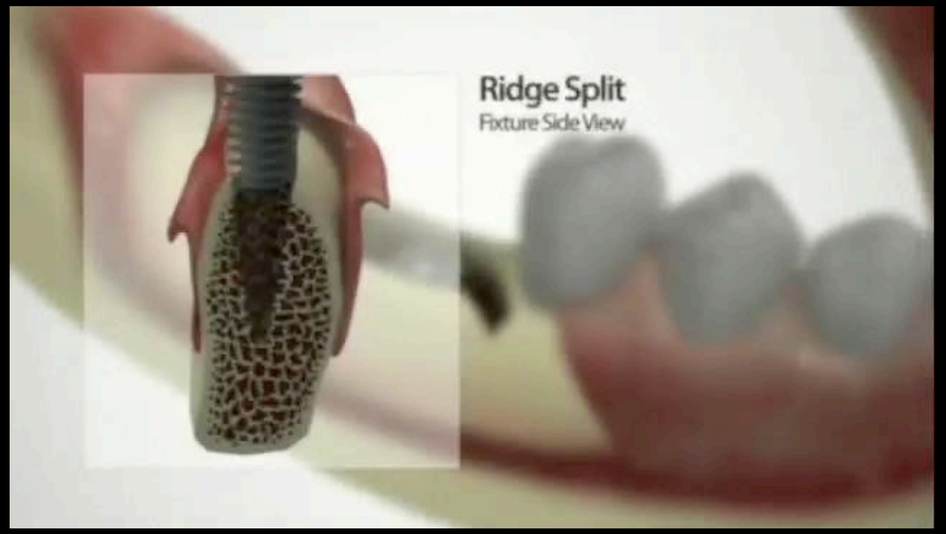
Narrow Ridge Wide Base

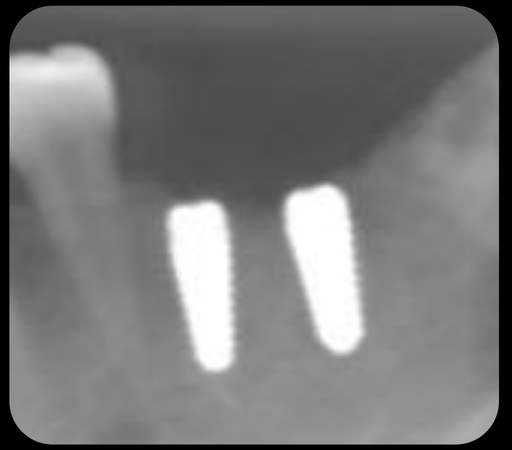


Ridge expansion



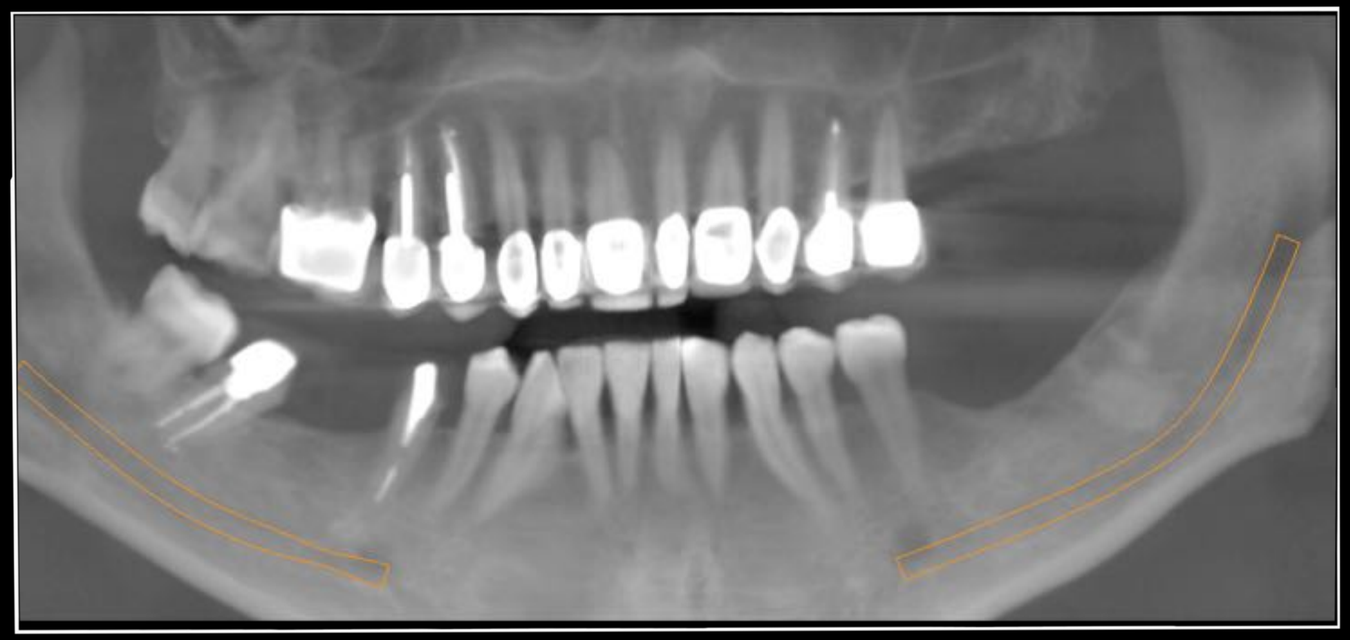


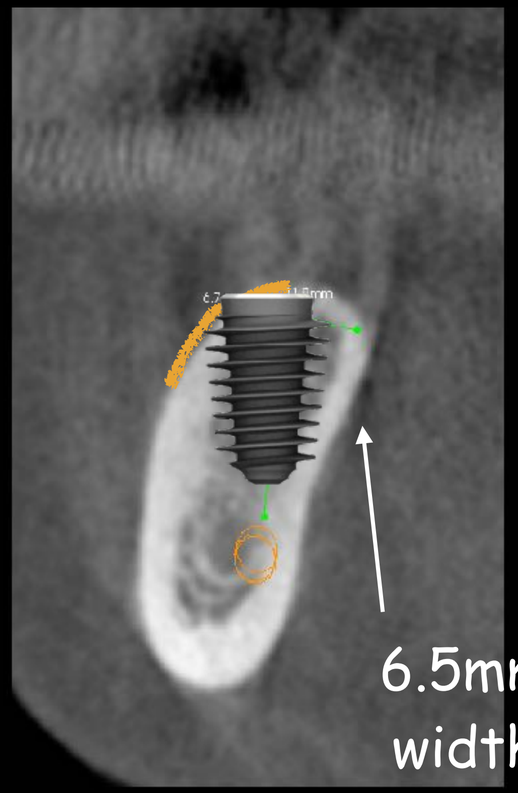


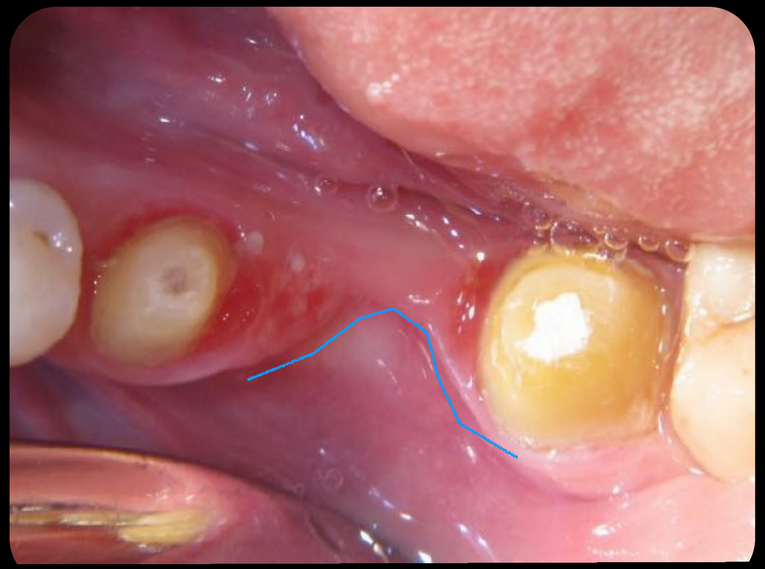


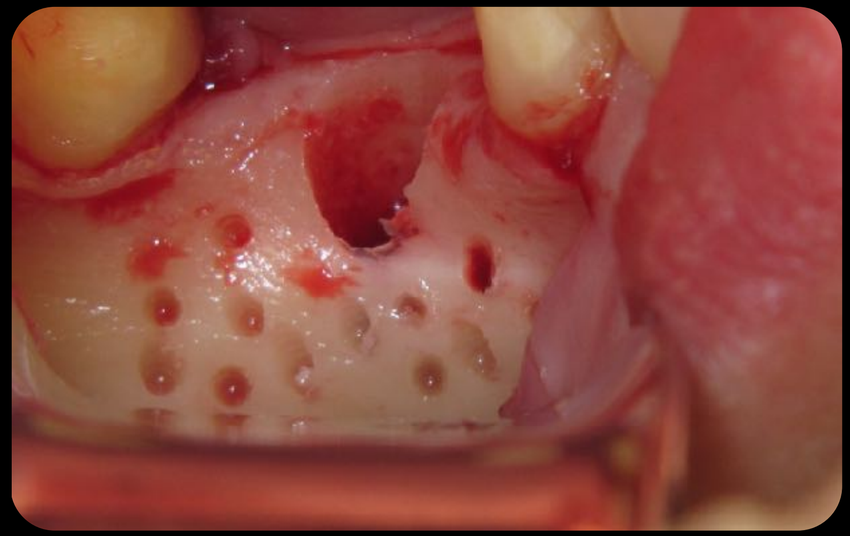
Lower Right

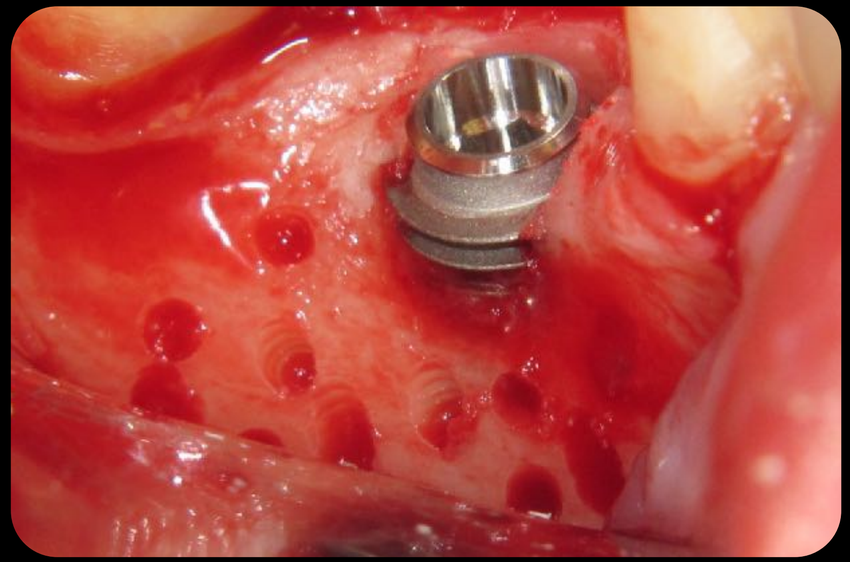
Lingualized position of crest



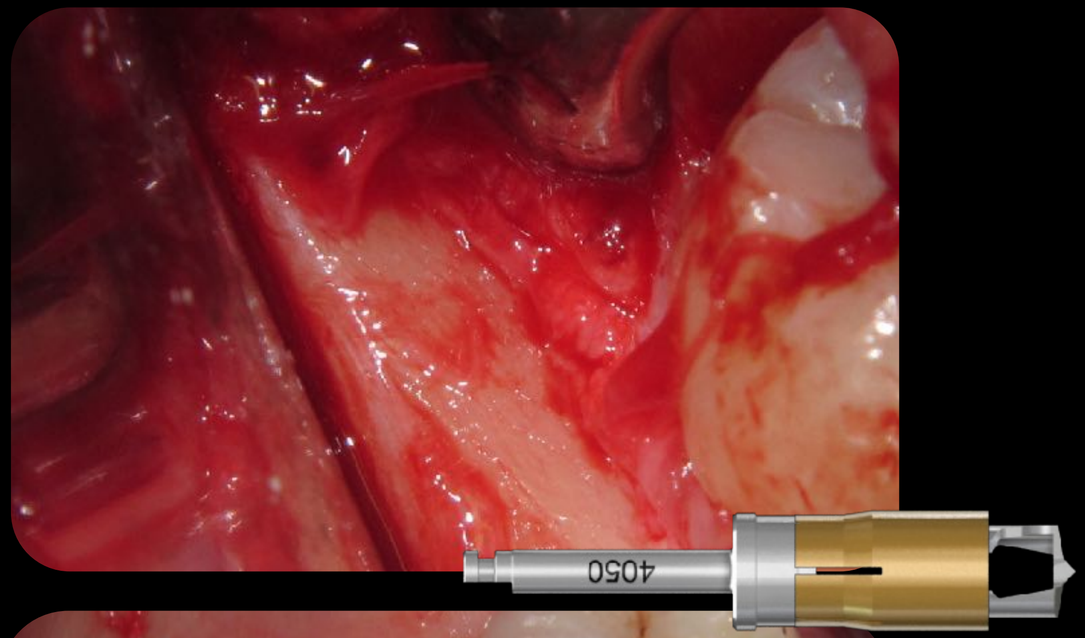


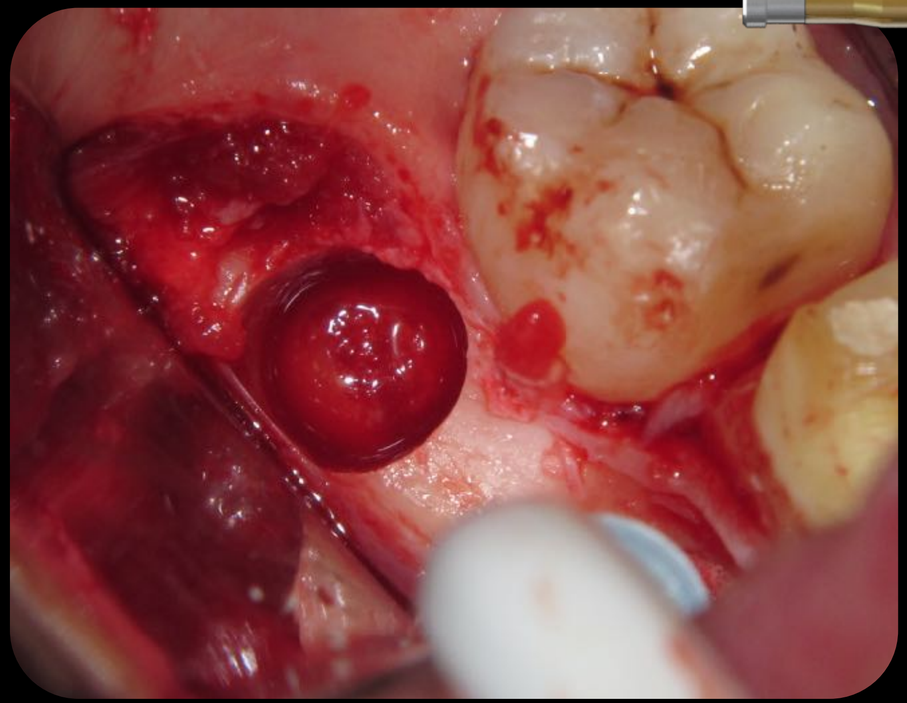


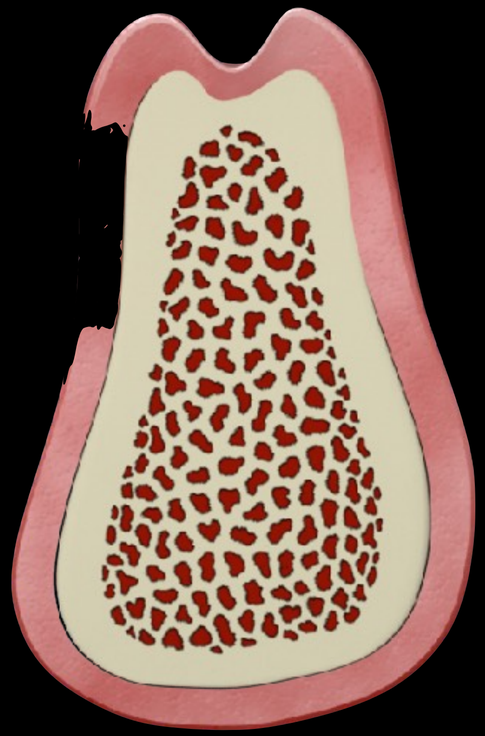




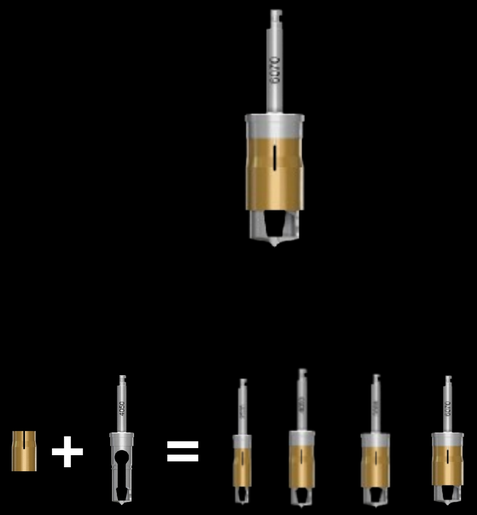
Harvesting & Particulating autogenous bone

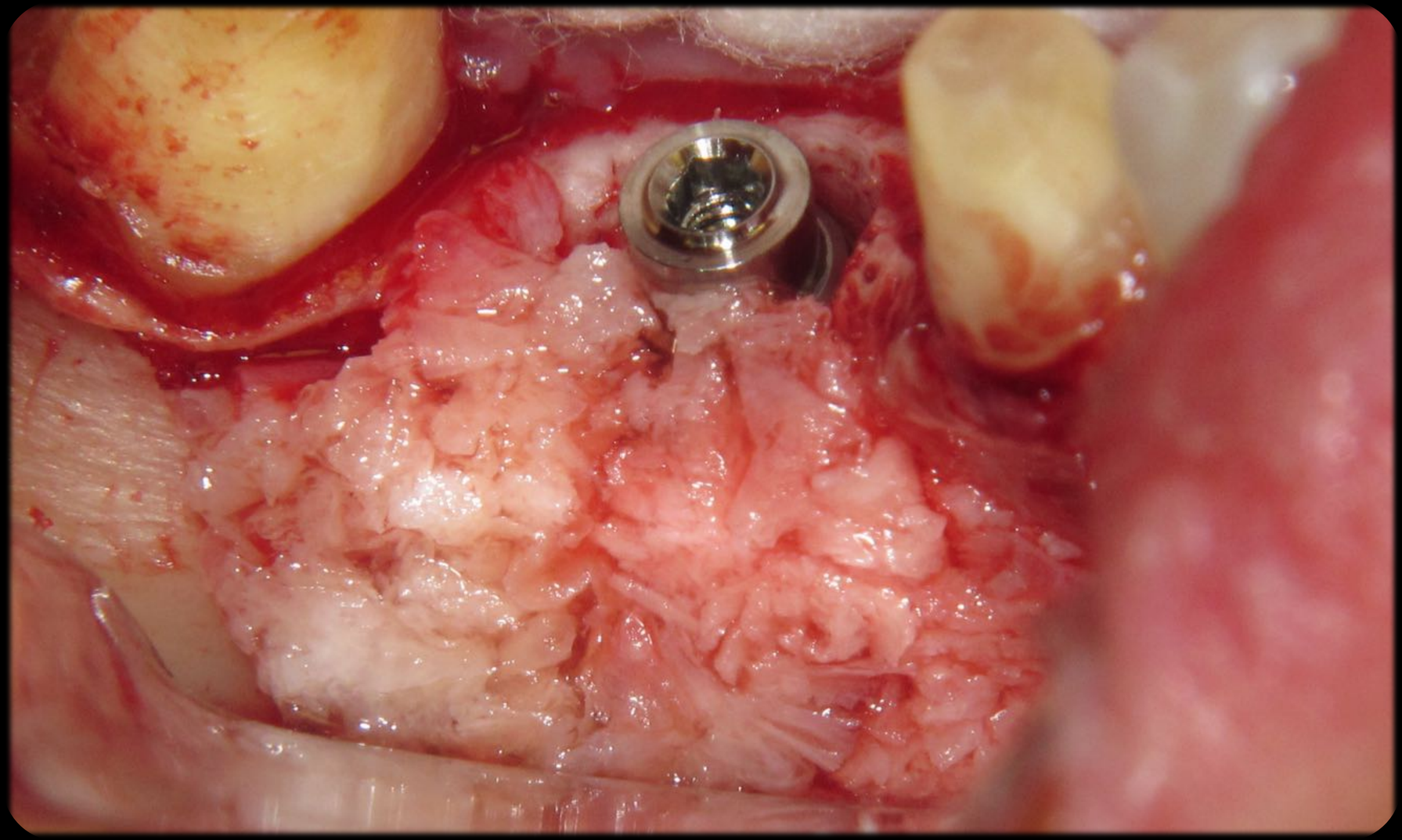




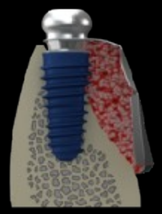


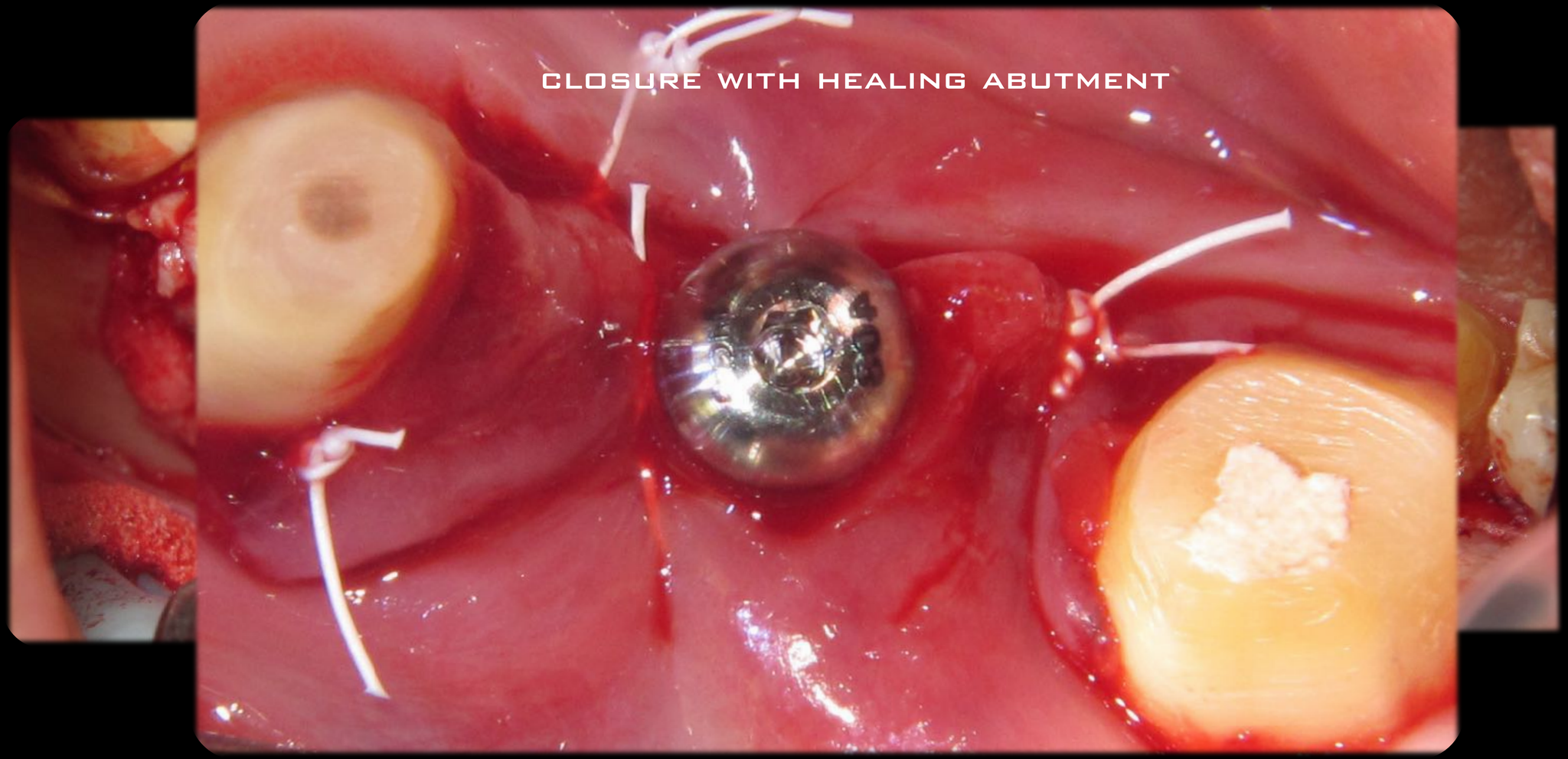
Auto-Max





i-Gen





CLOSURE WITH HEALING ABUTMENT

3.5 month post op

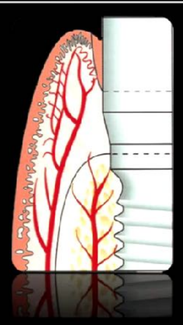
Natural Teeth vs Implants
Biological Comparisons

- Periodontal Ligament

- Vascular Supply
very few vessels
were found in the connective tissue near
the transmucosal portion of the
implant. This limited blood supply makes the
peri-implant tissues less resilient to both mechanical
and microbiological insults.

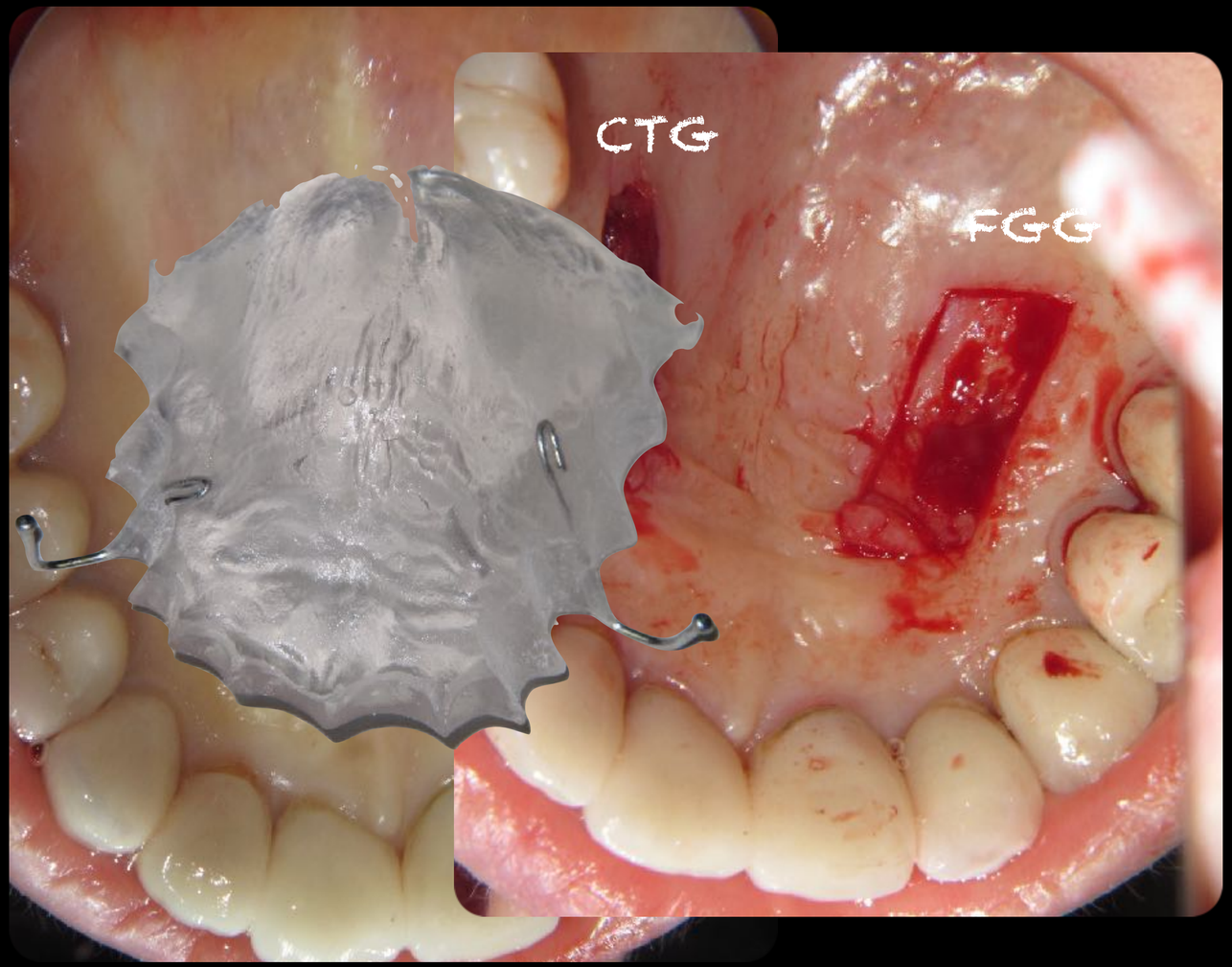
- Connective Tissue

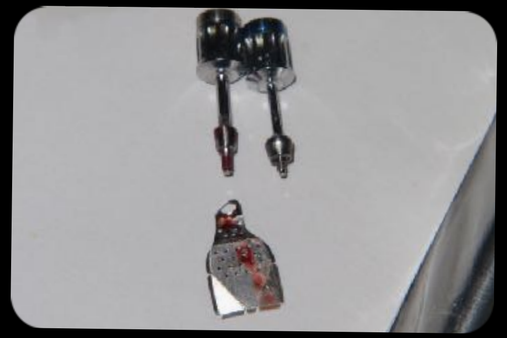
- Junctional Epithelium

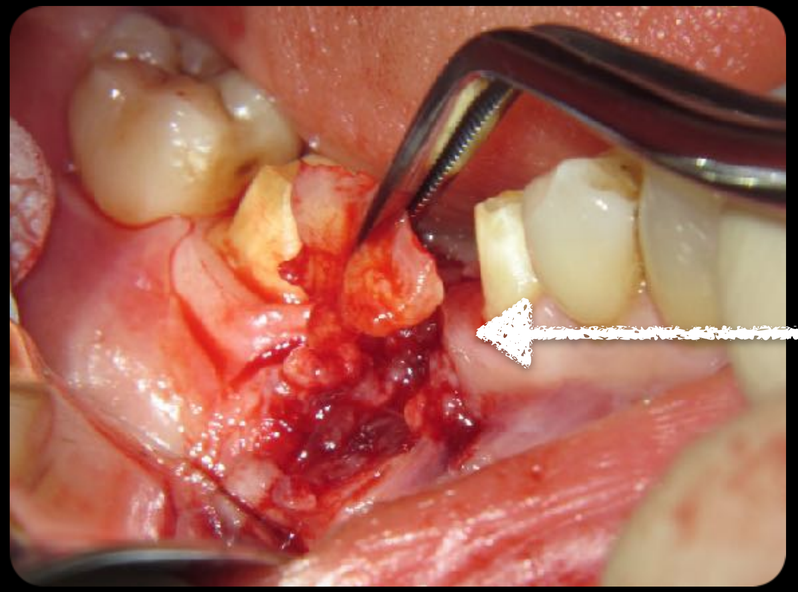


Improving the soft tissues

Palatal Harvest



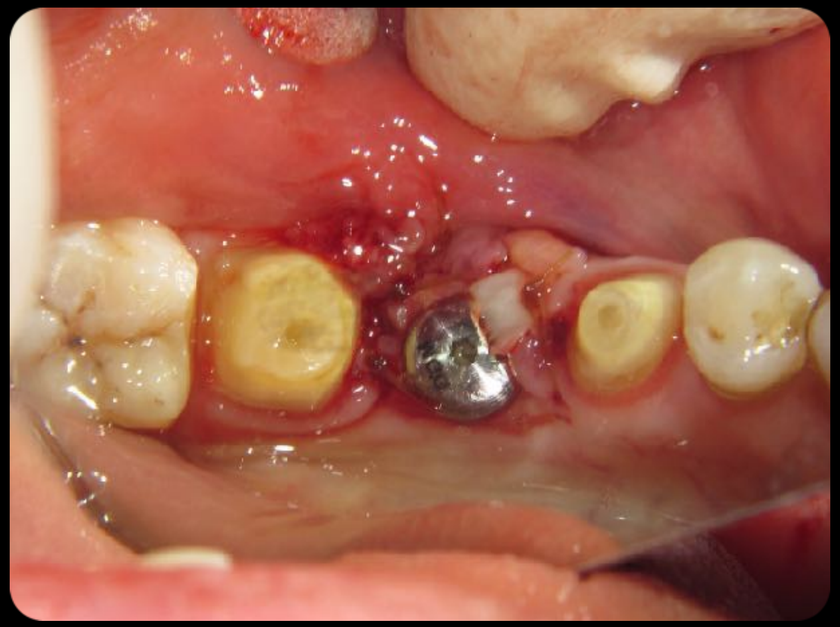





CTG
FGG

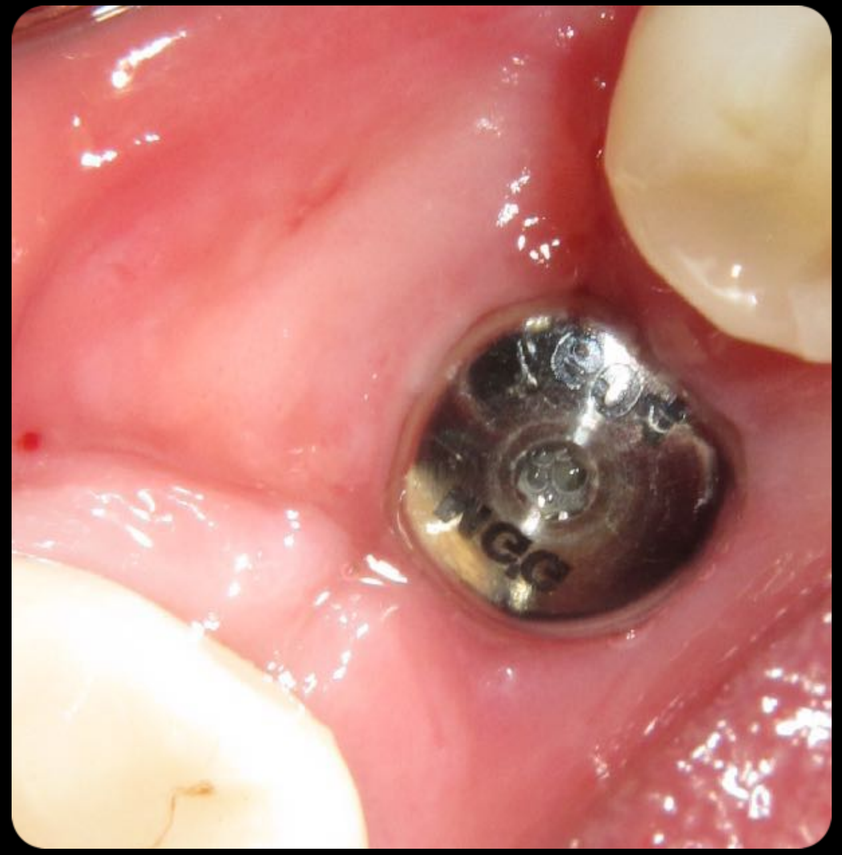
GGF

CTG



4 weeks

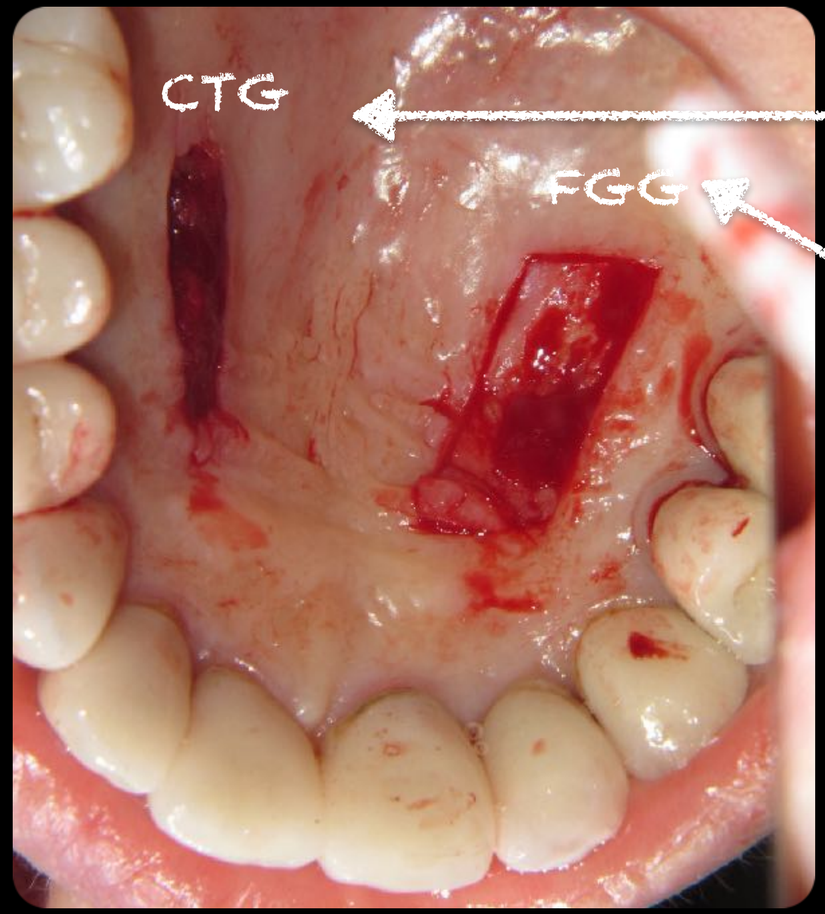
2 weeks



22 weeks

Pain scale 1-10

Palatal Guard

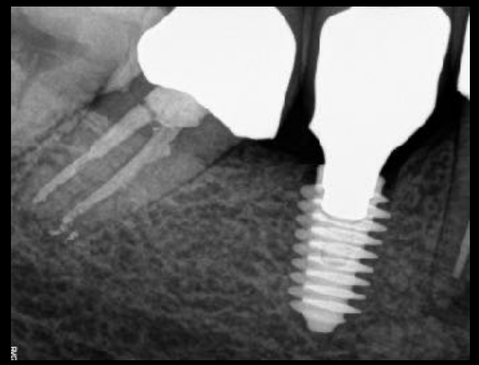


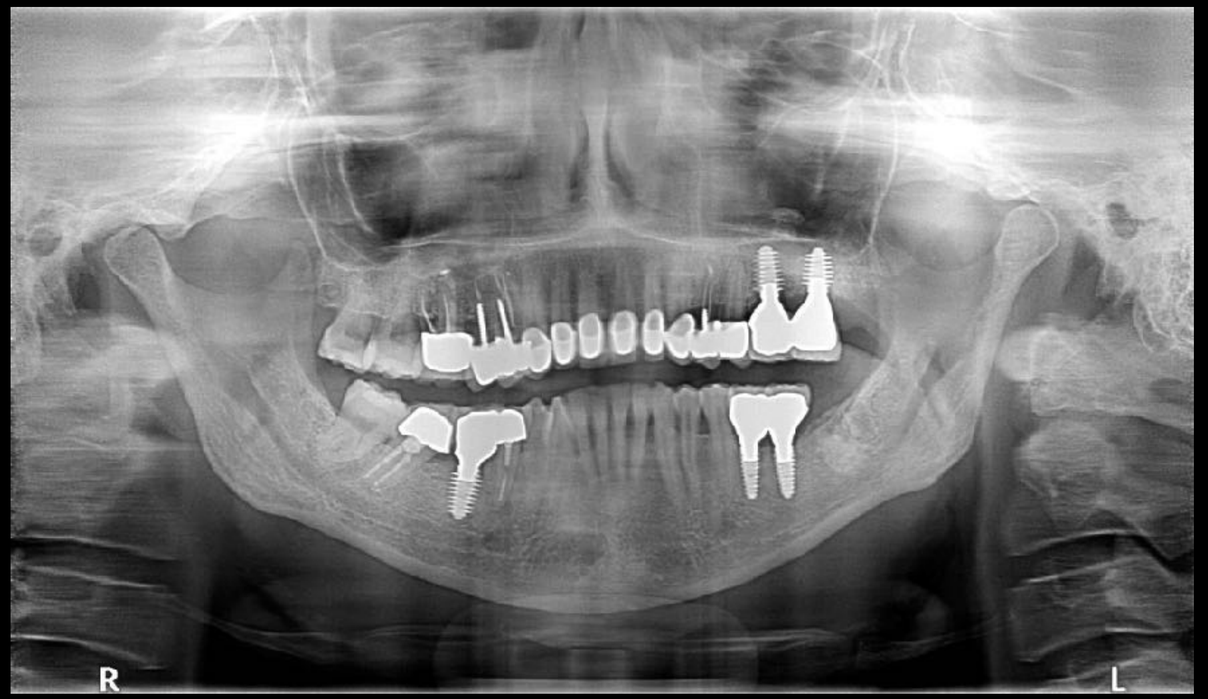
4

2

NO SUTURES

2 YR Post Op





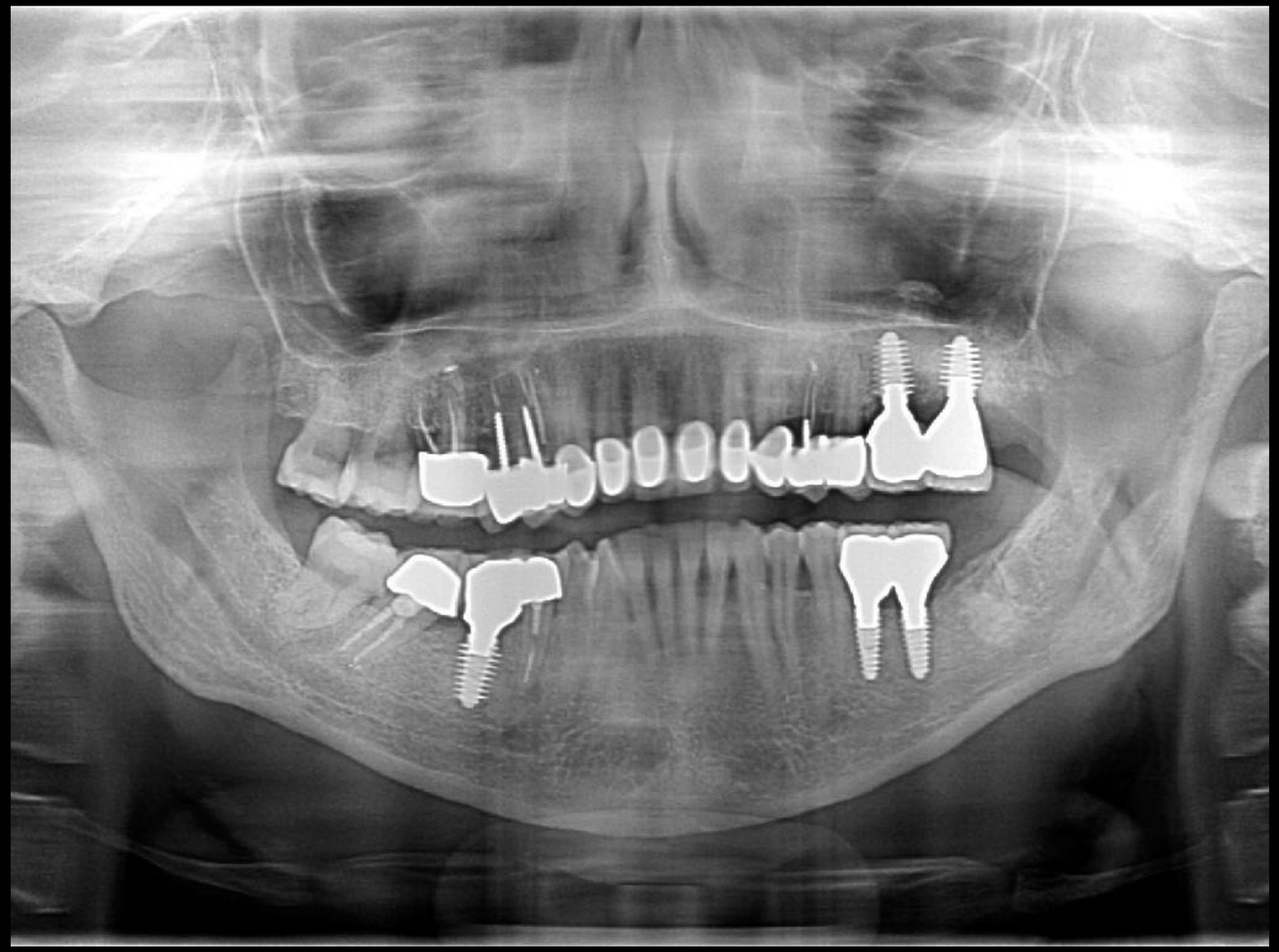
After

Before

After

4 Year Follow up

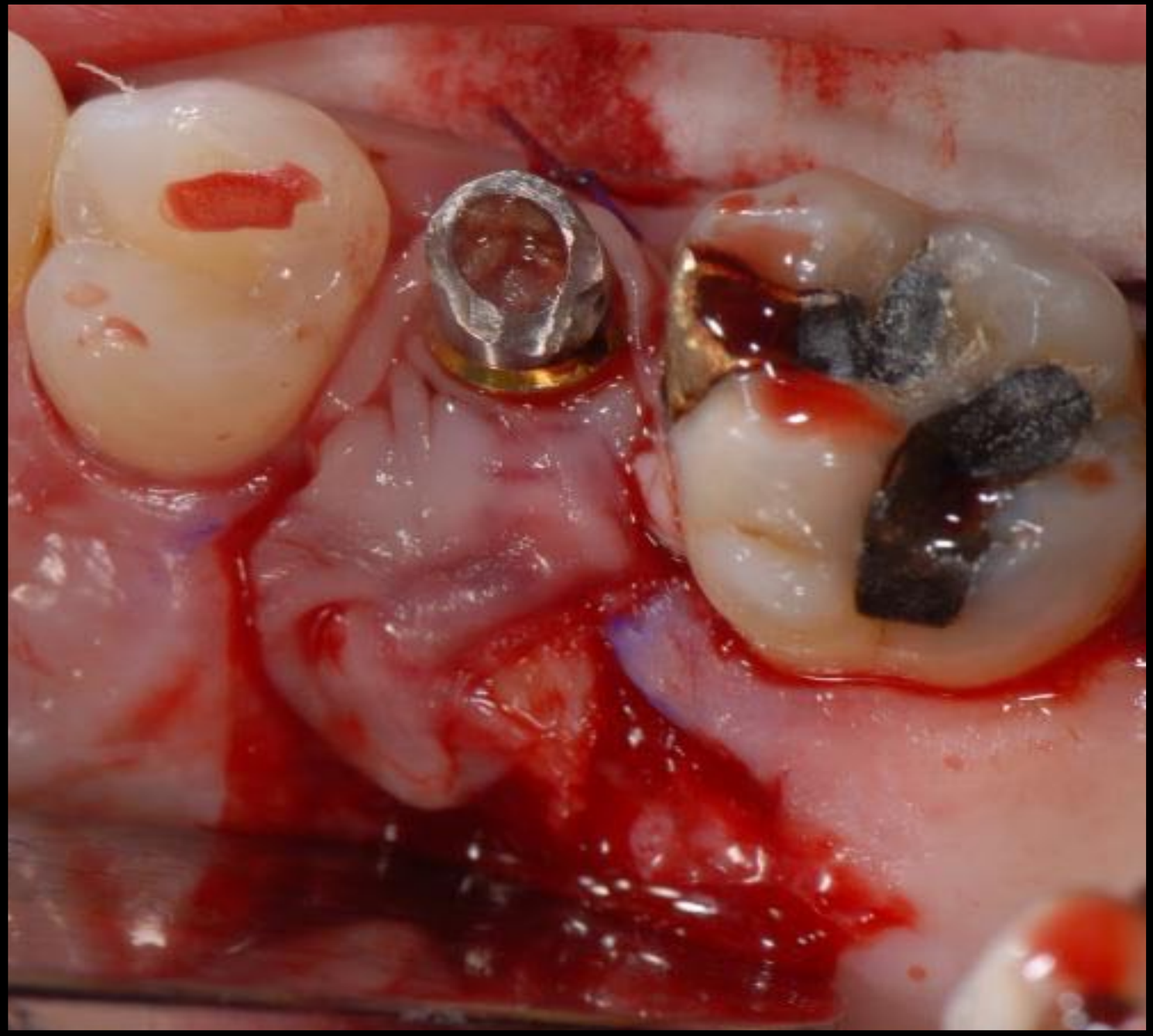
Treatment Plan	Time
•Ext #14,#15#16	1 visit
•Dental Caries	3 visits
•Perio S/R	2 visits
•Crowns functional/cosemtic	3 visits
•UL Sinus Augmentation	2 visits
•GBR #30	2 visits
•Implants #14, #15, #18, #19,#30	2 visits



Estimated length of treatment =
15 visits 1.5 years

Actual length of treatment =
6 visits 5.5 months

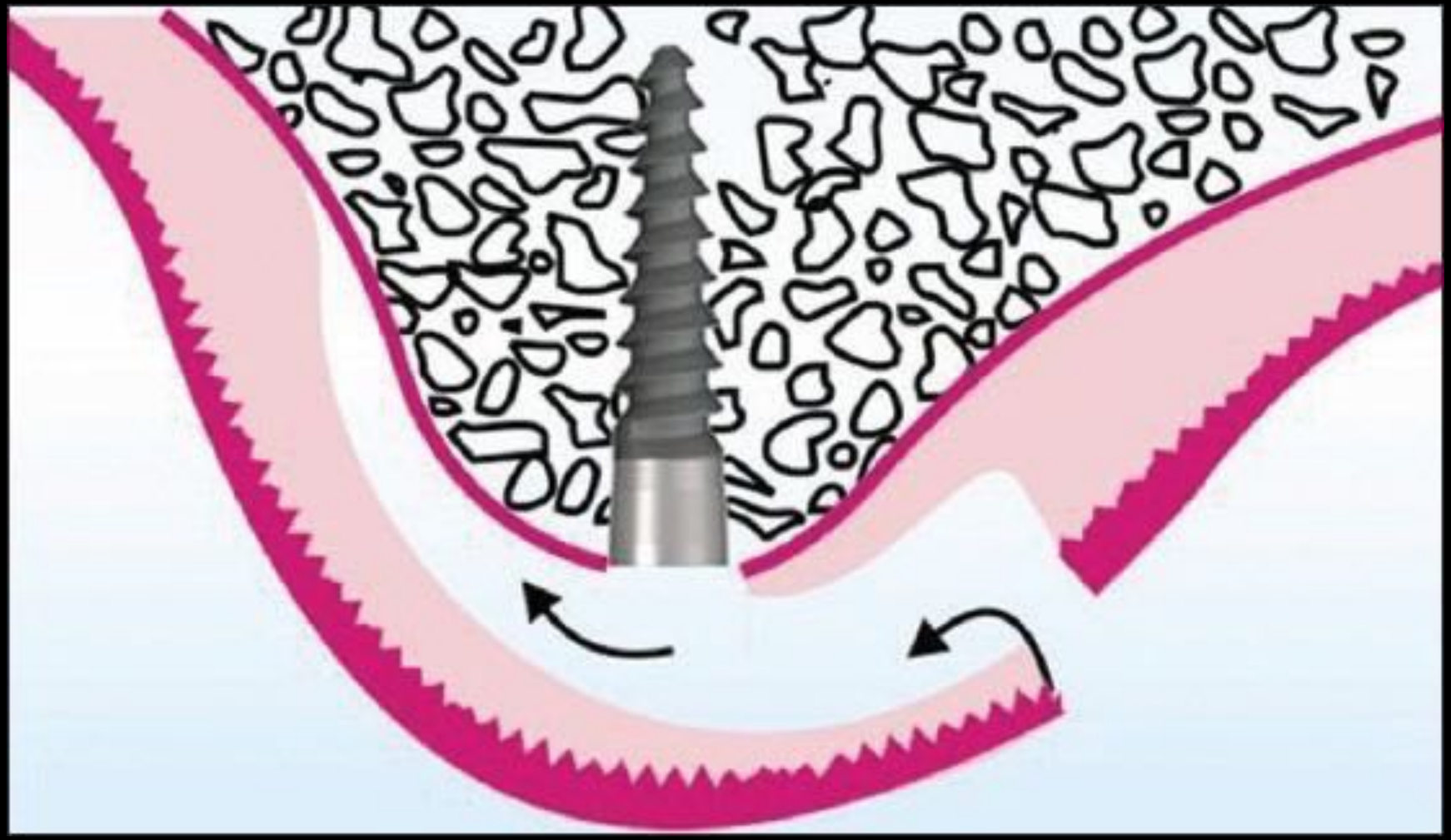
Sliding Flap



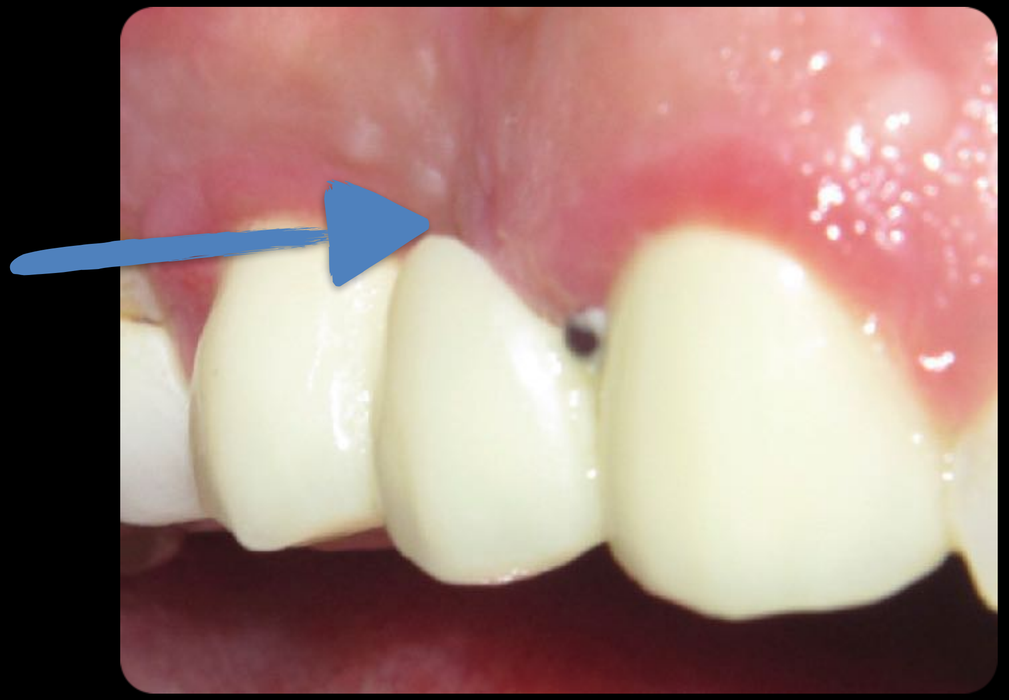

7 Day post op

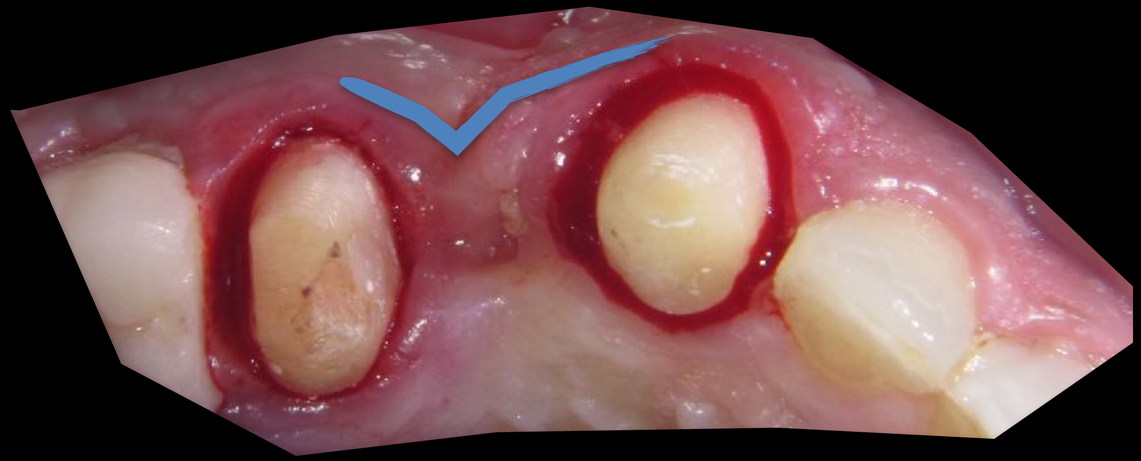

1 year post op

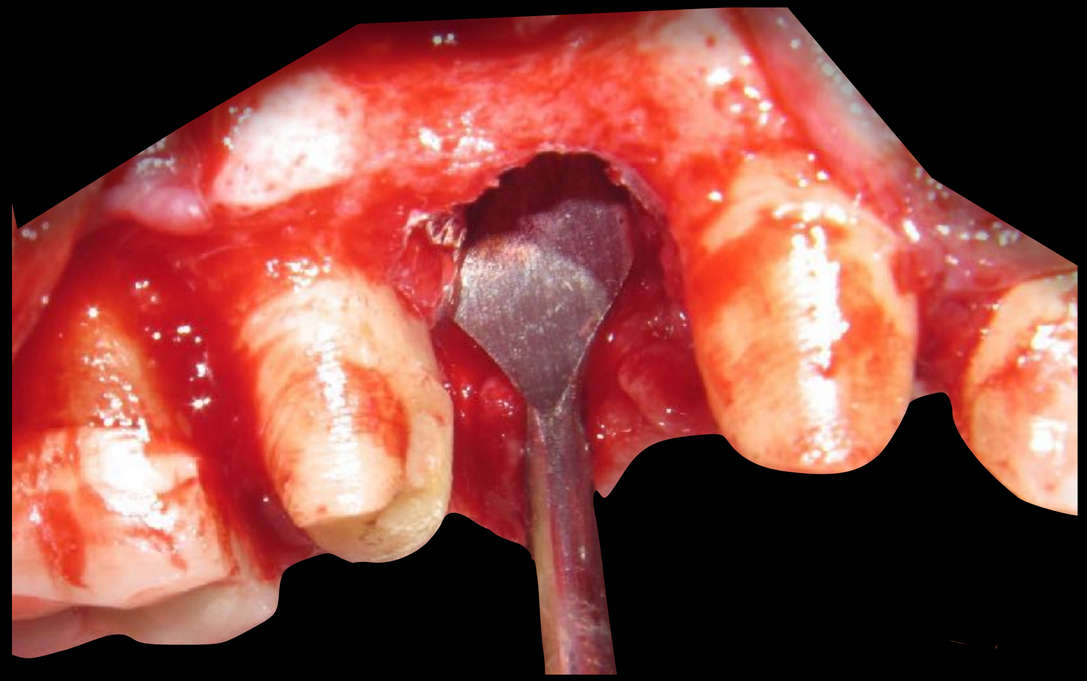
Roll Flap

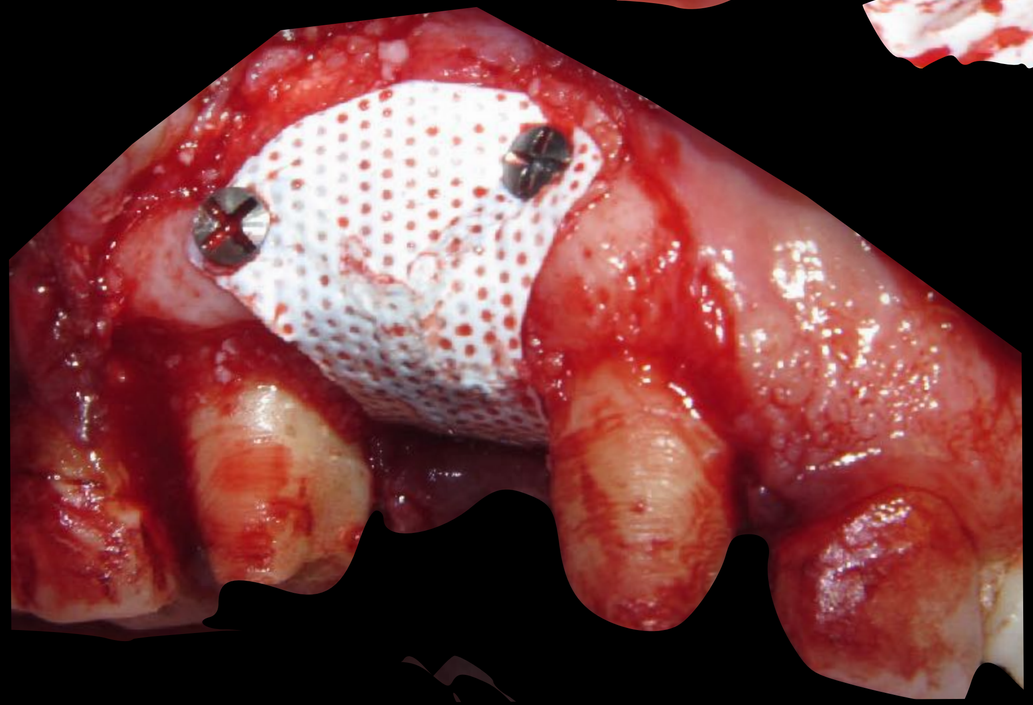


Intial

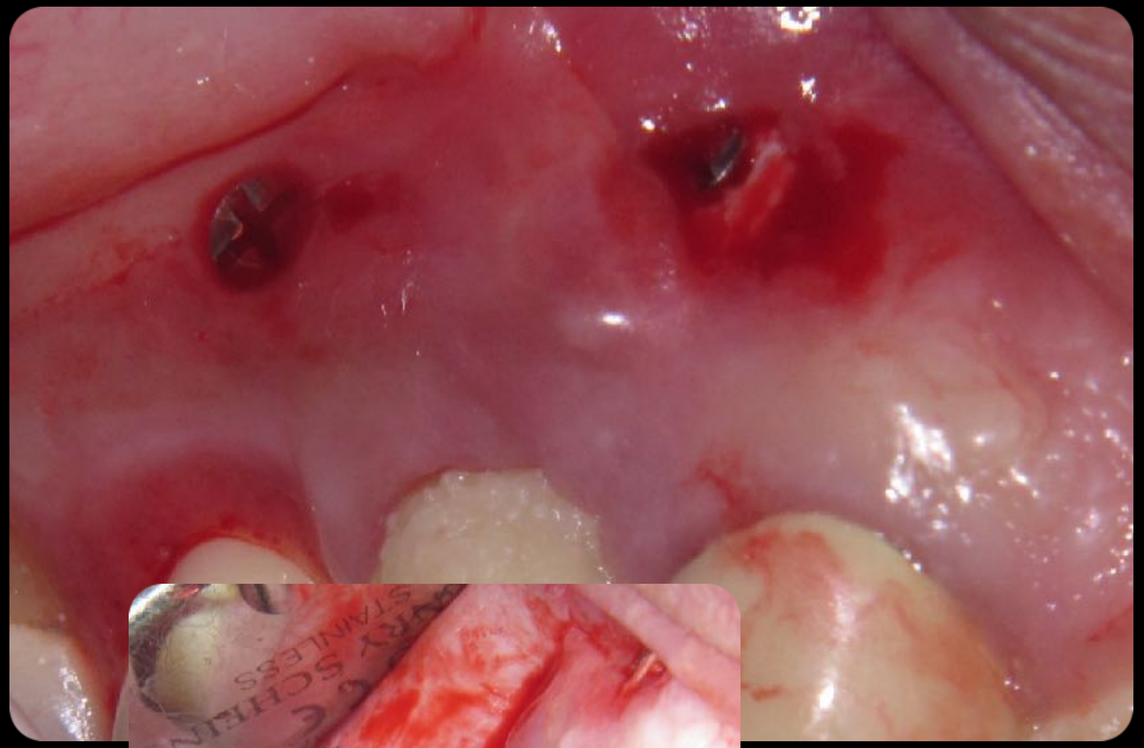


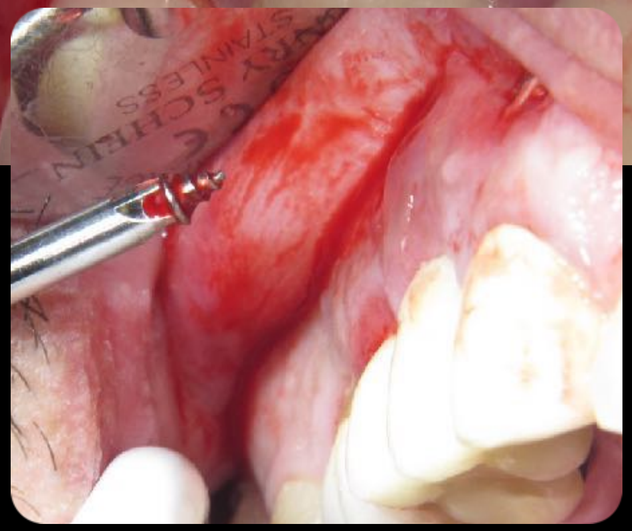


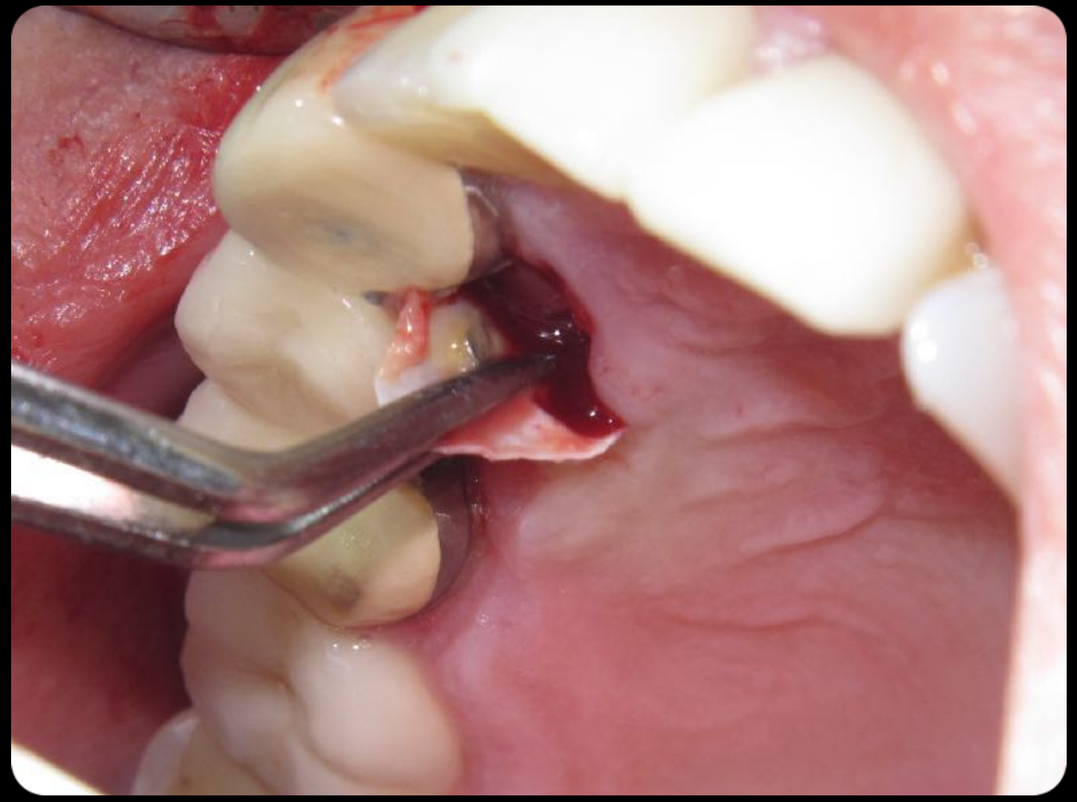


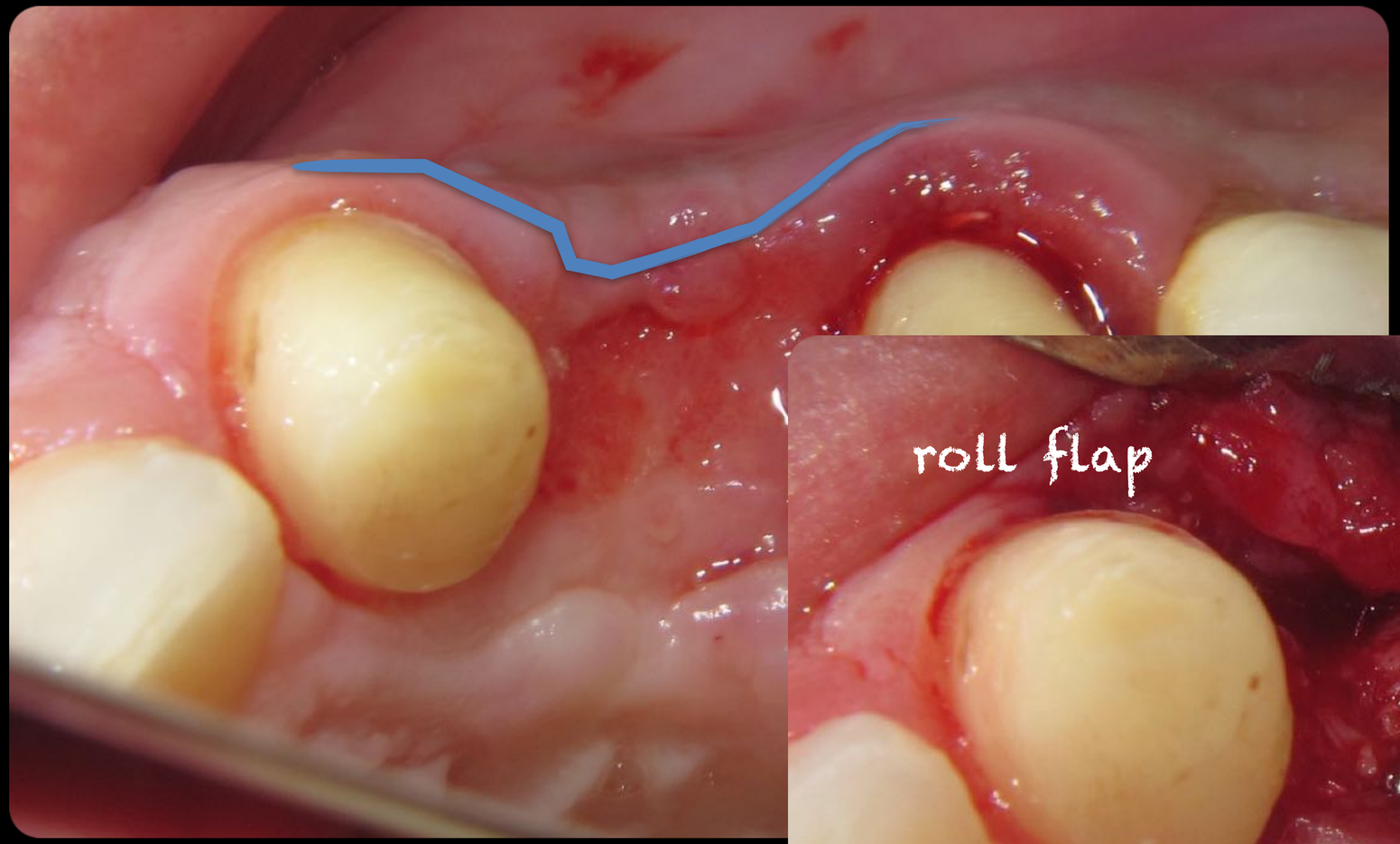


4 months post op

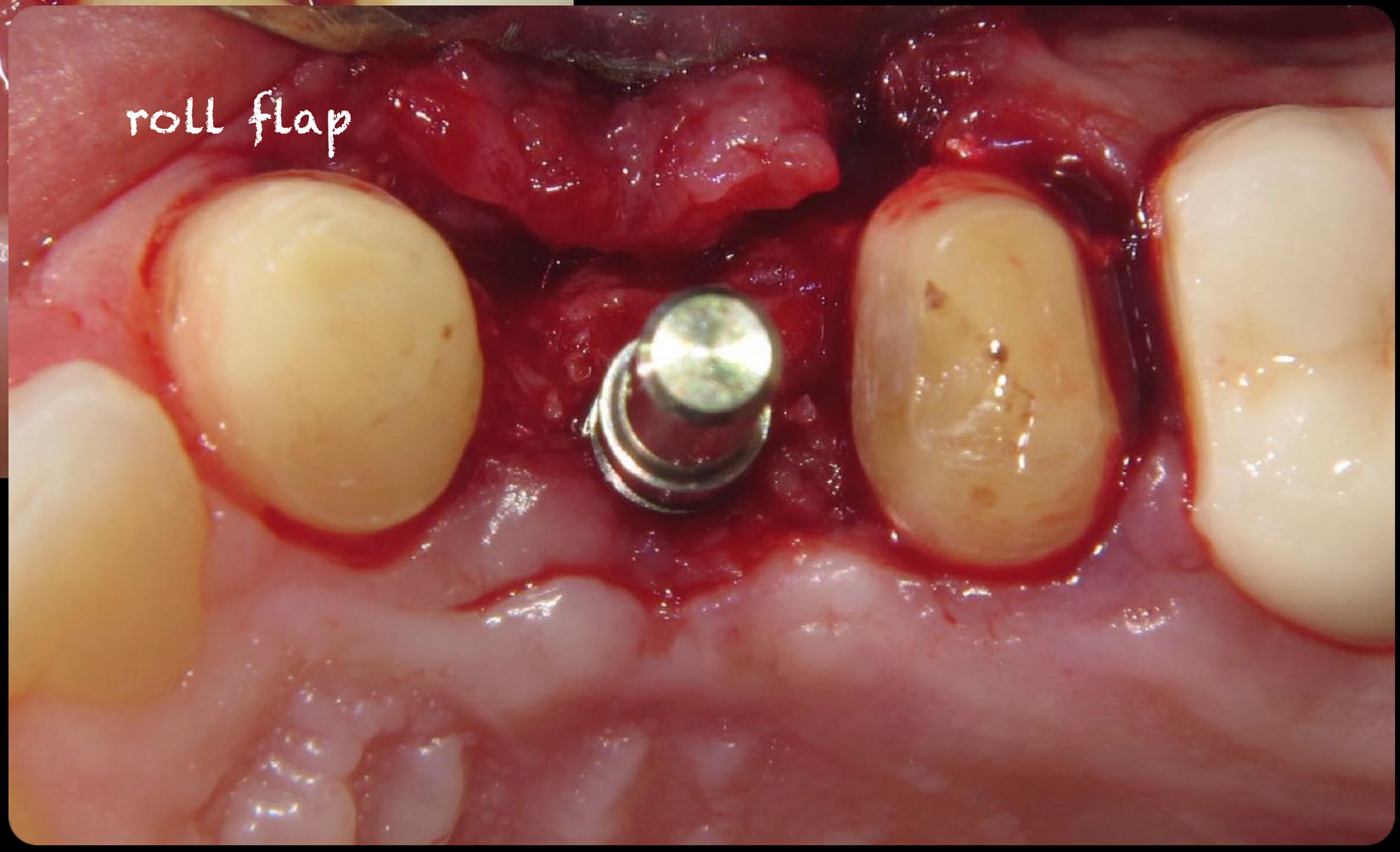




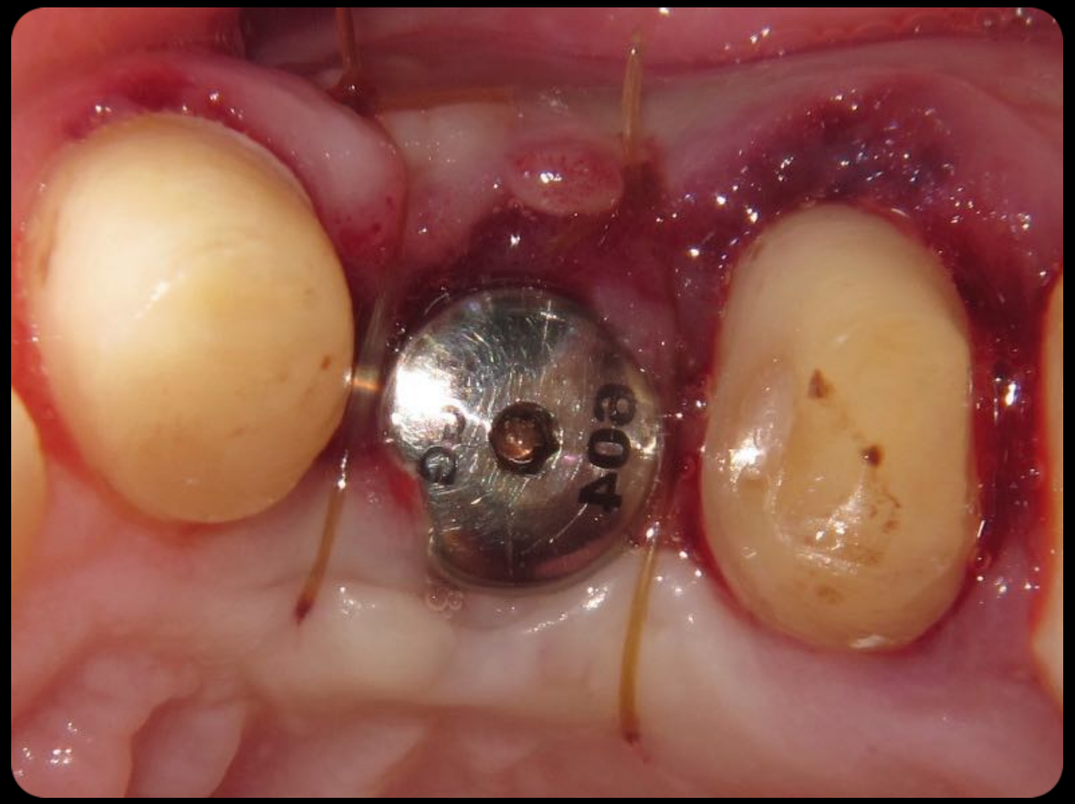




5 month post op



Roll Flap

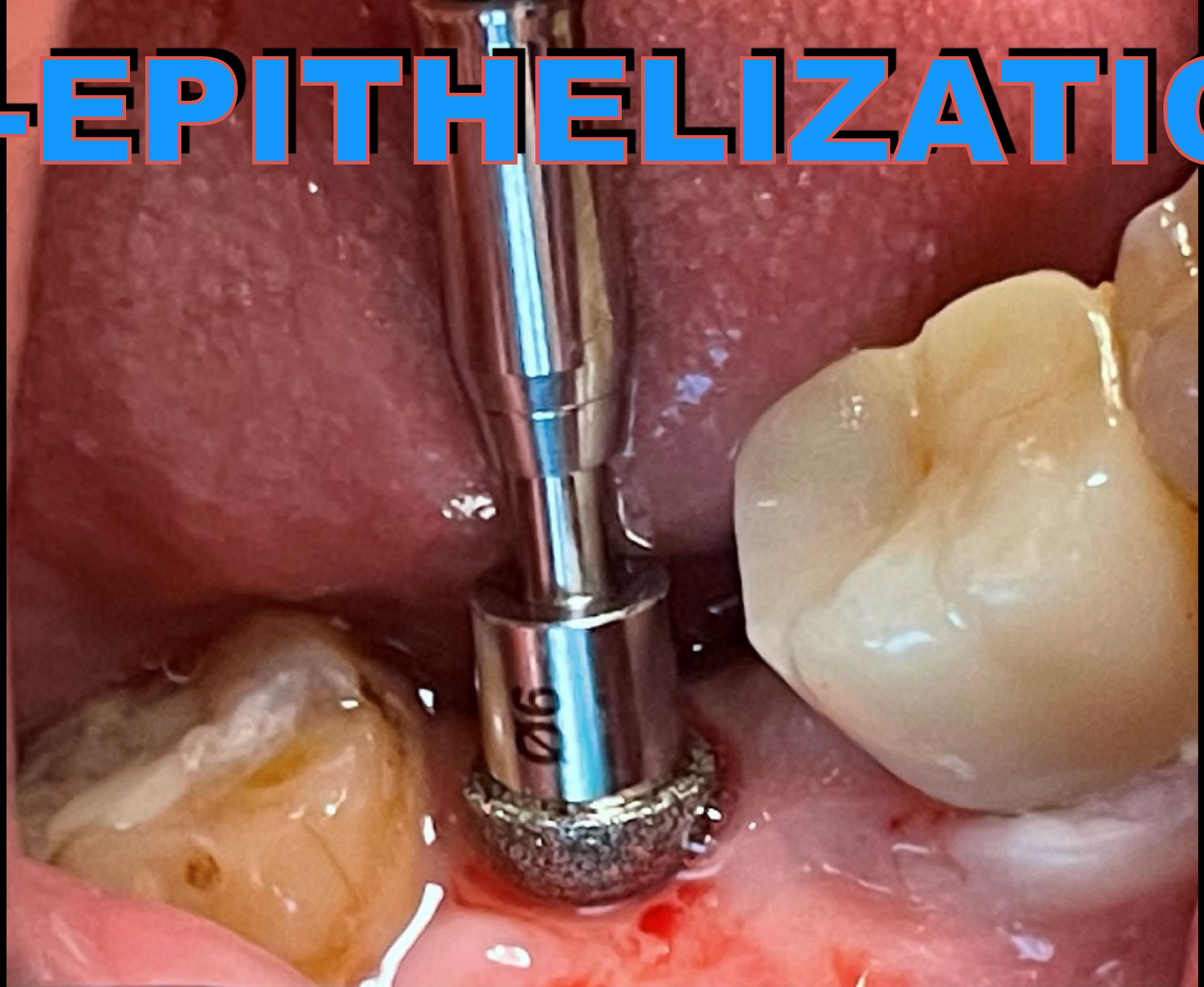


Initial

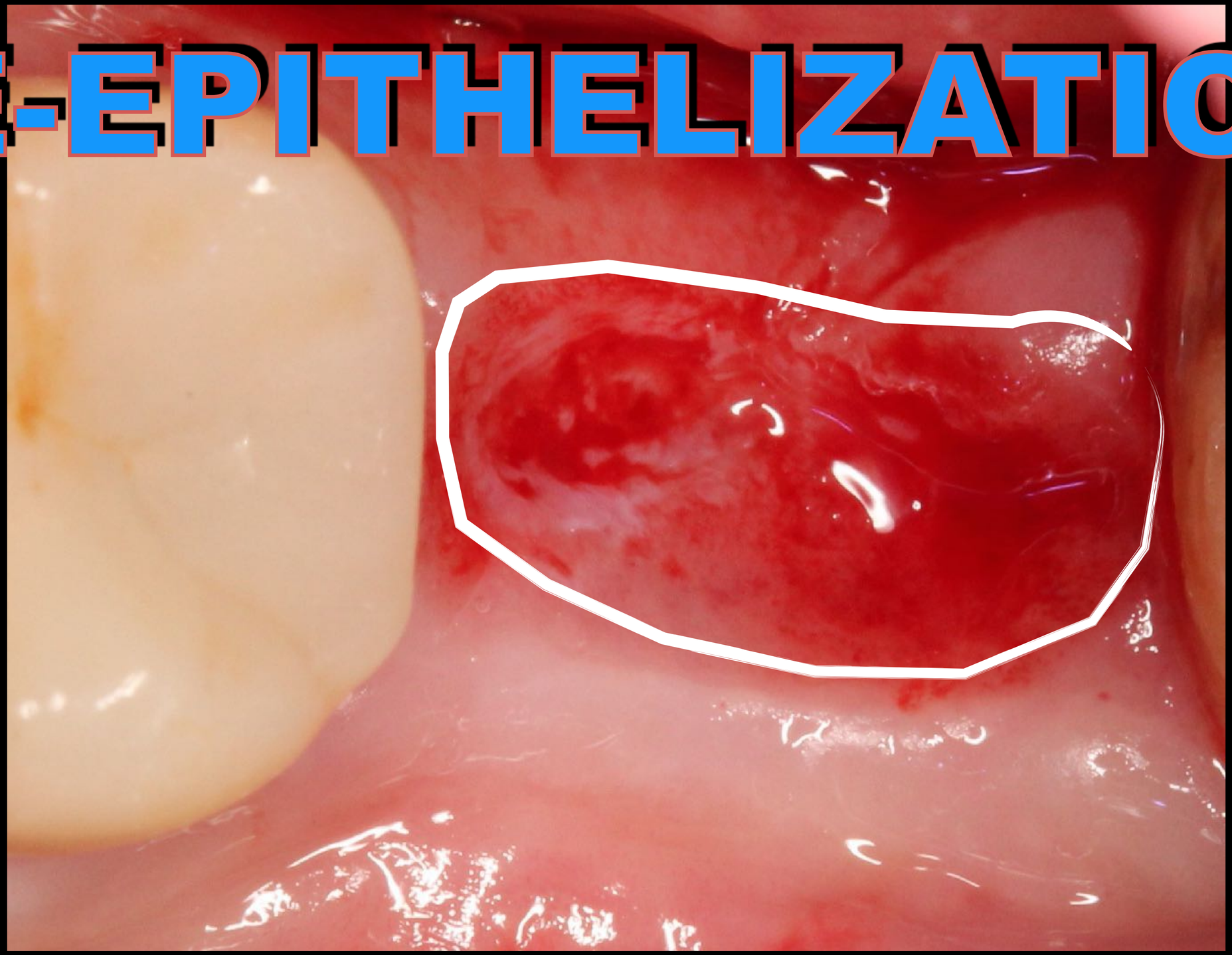
2 year post op

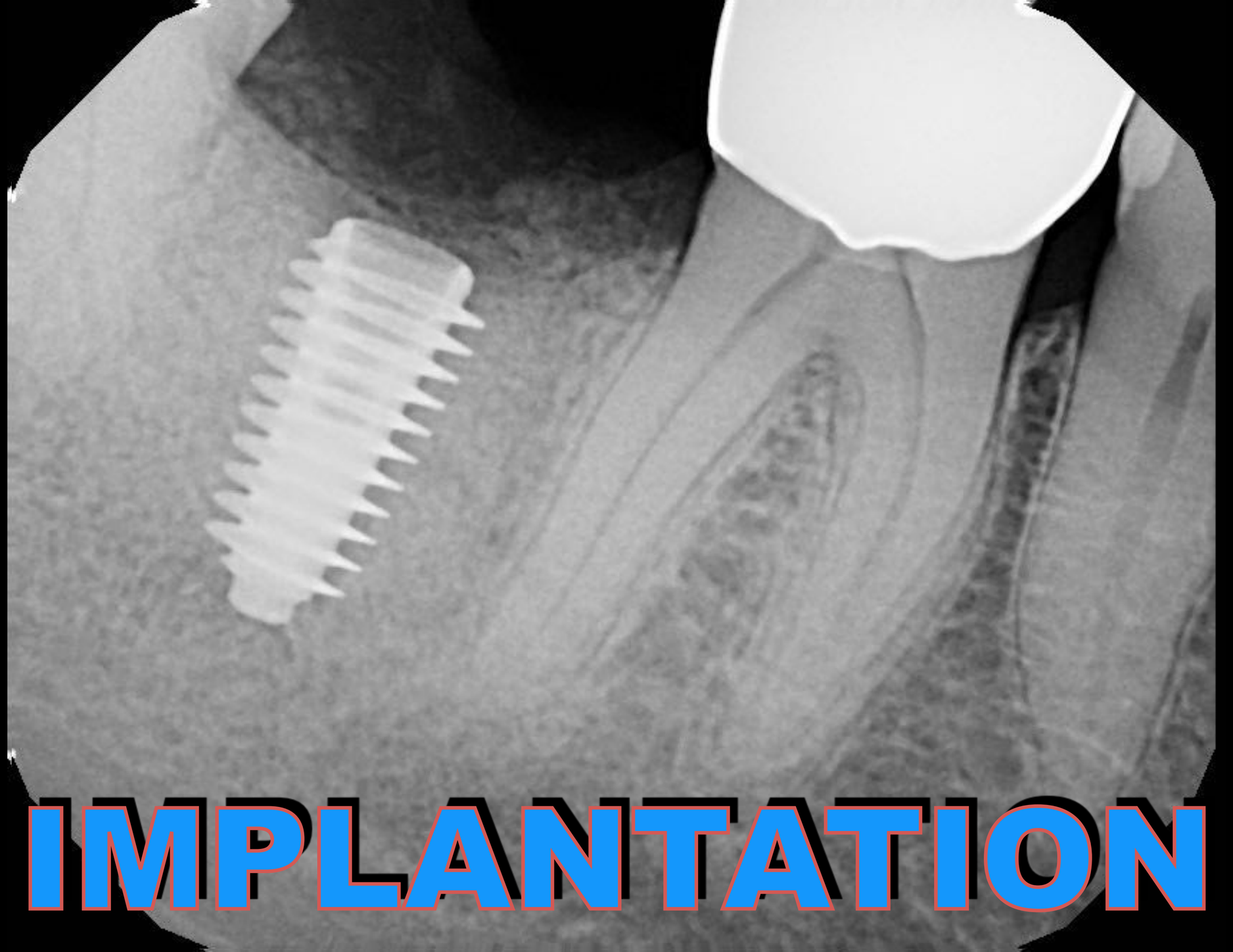
DE-EPITHELIZATION

DE-EPITHELIZATION

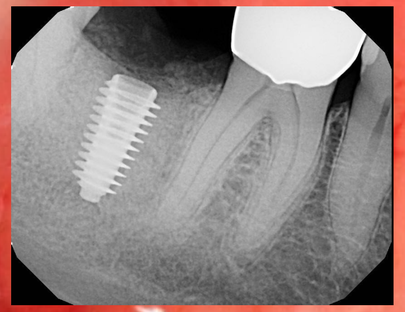


DE-EPITHELIZATION

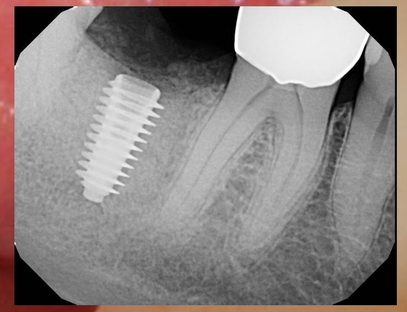




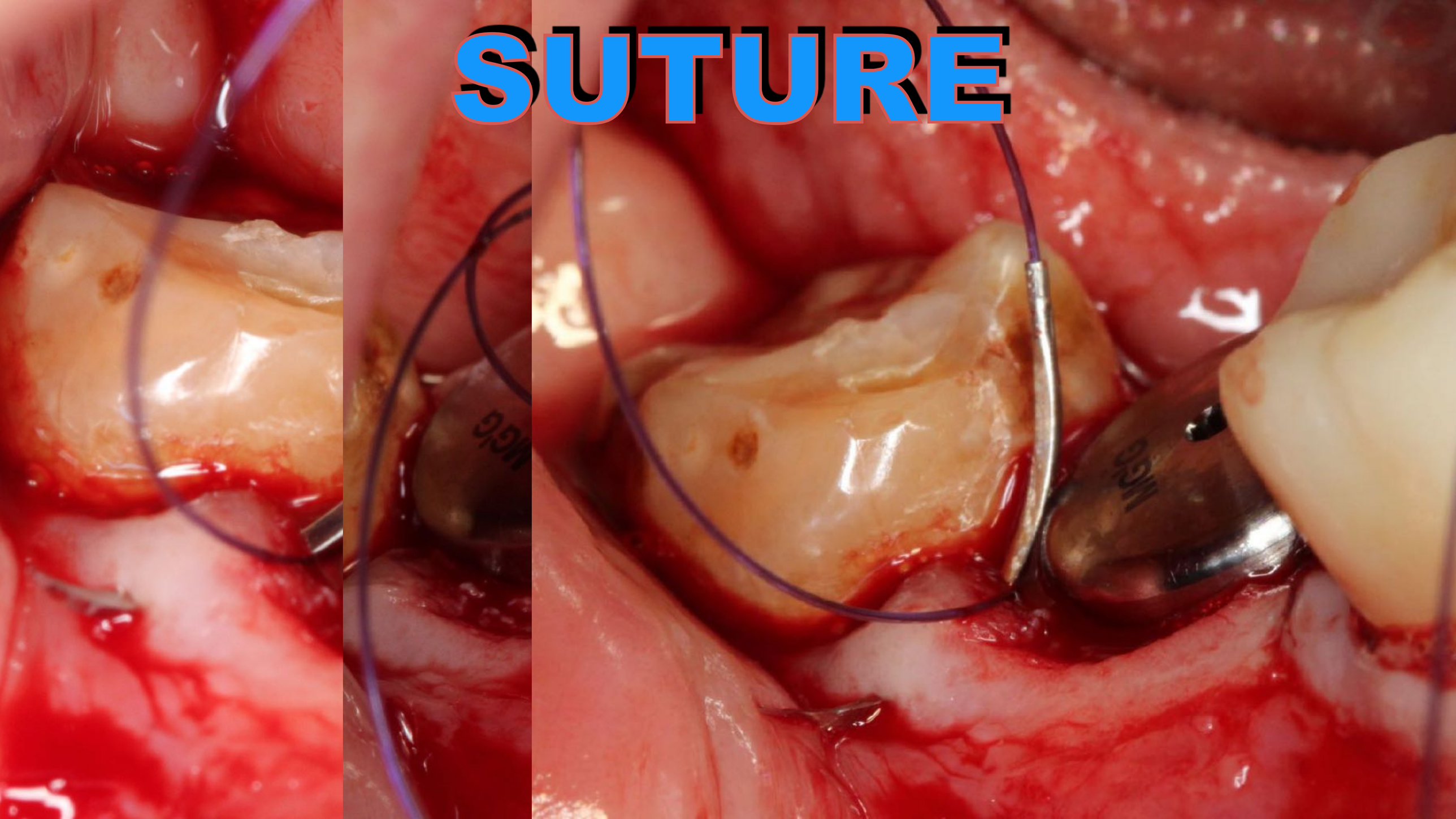
IMPLANTATION



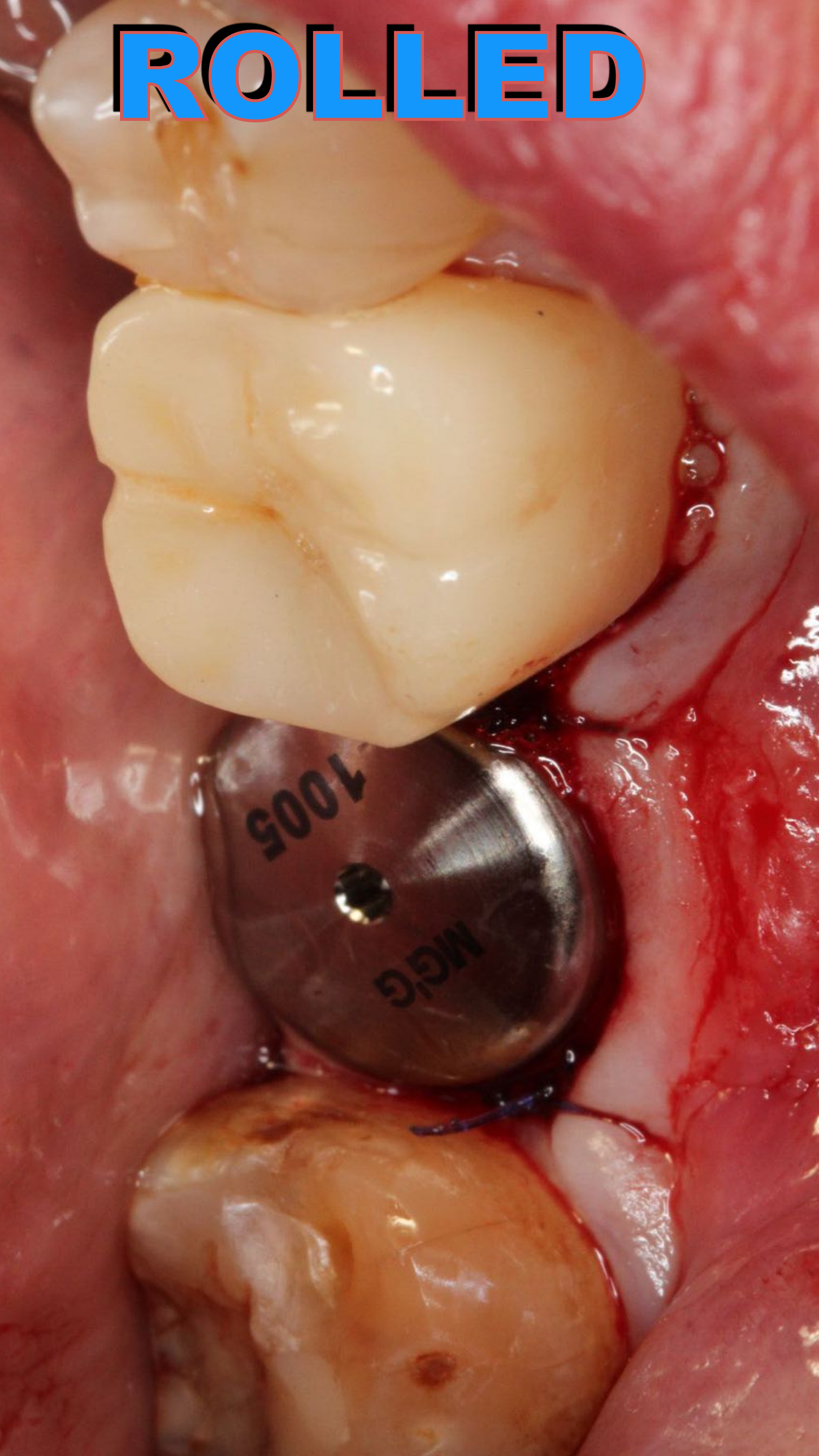
TUCK & ROLL

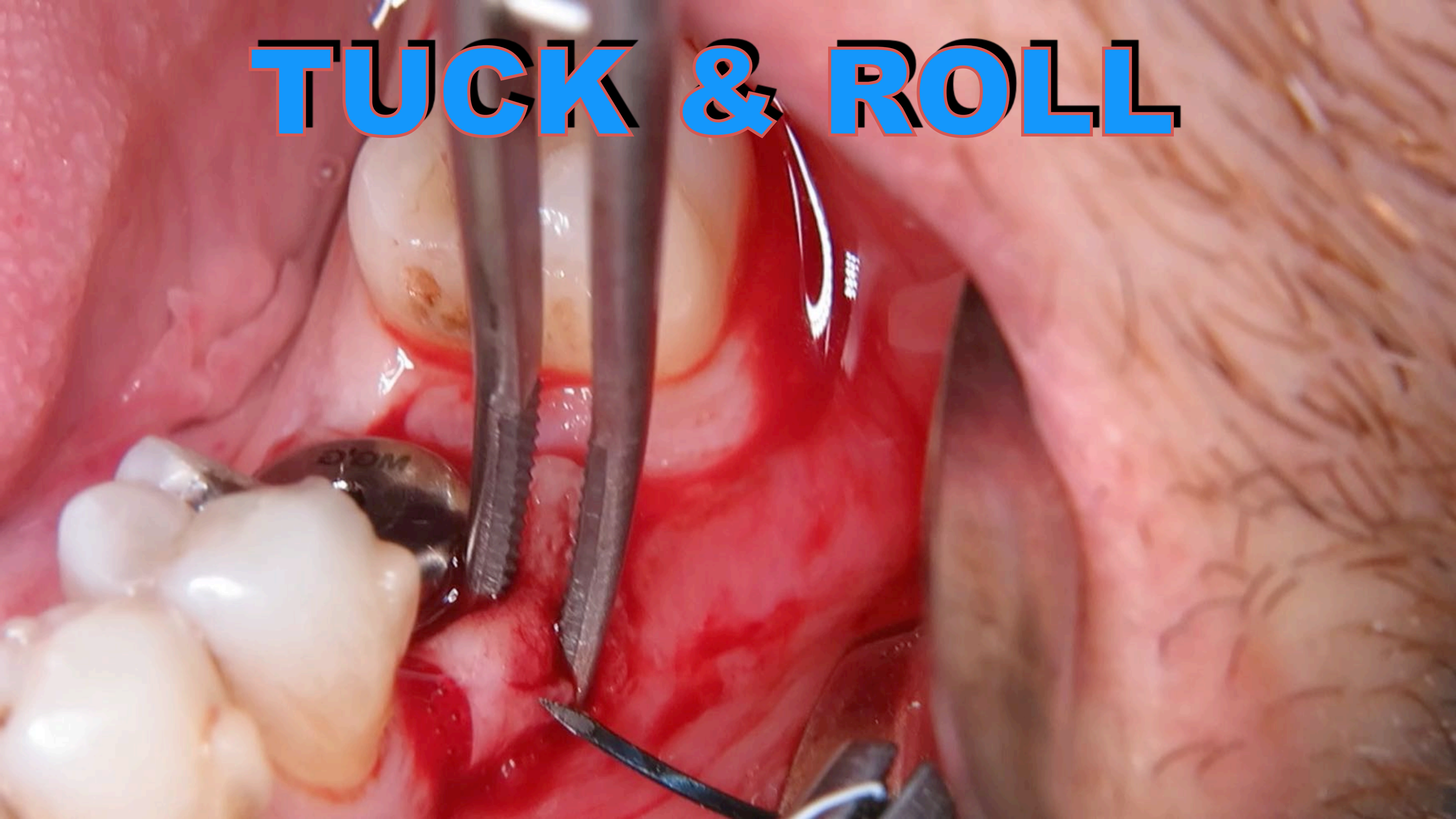


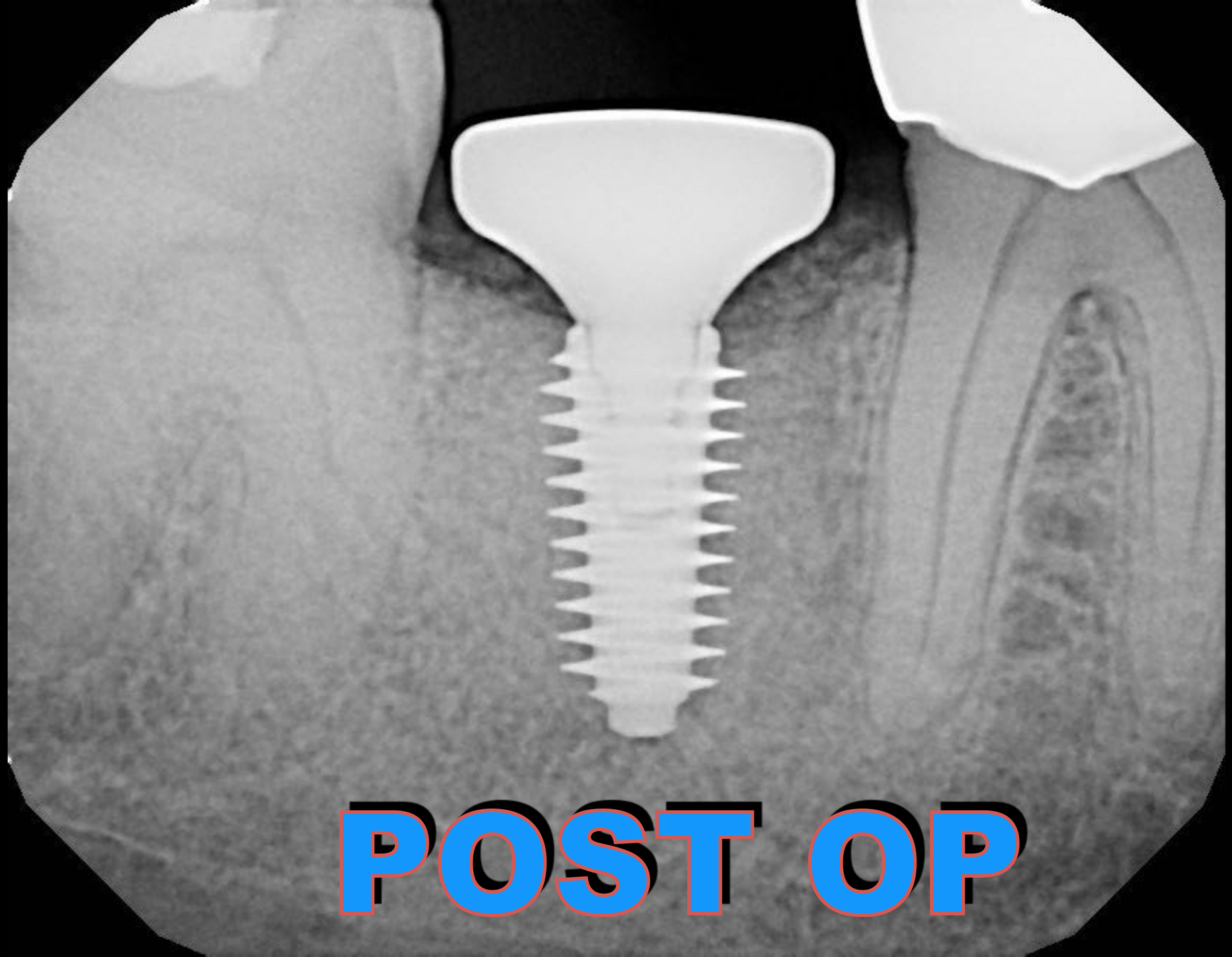
SUTURE




ROLLED


ROLLED
1005
MG6

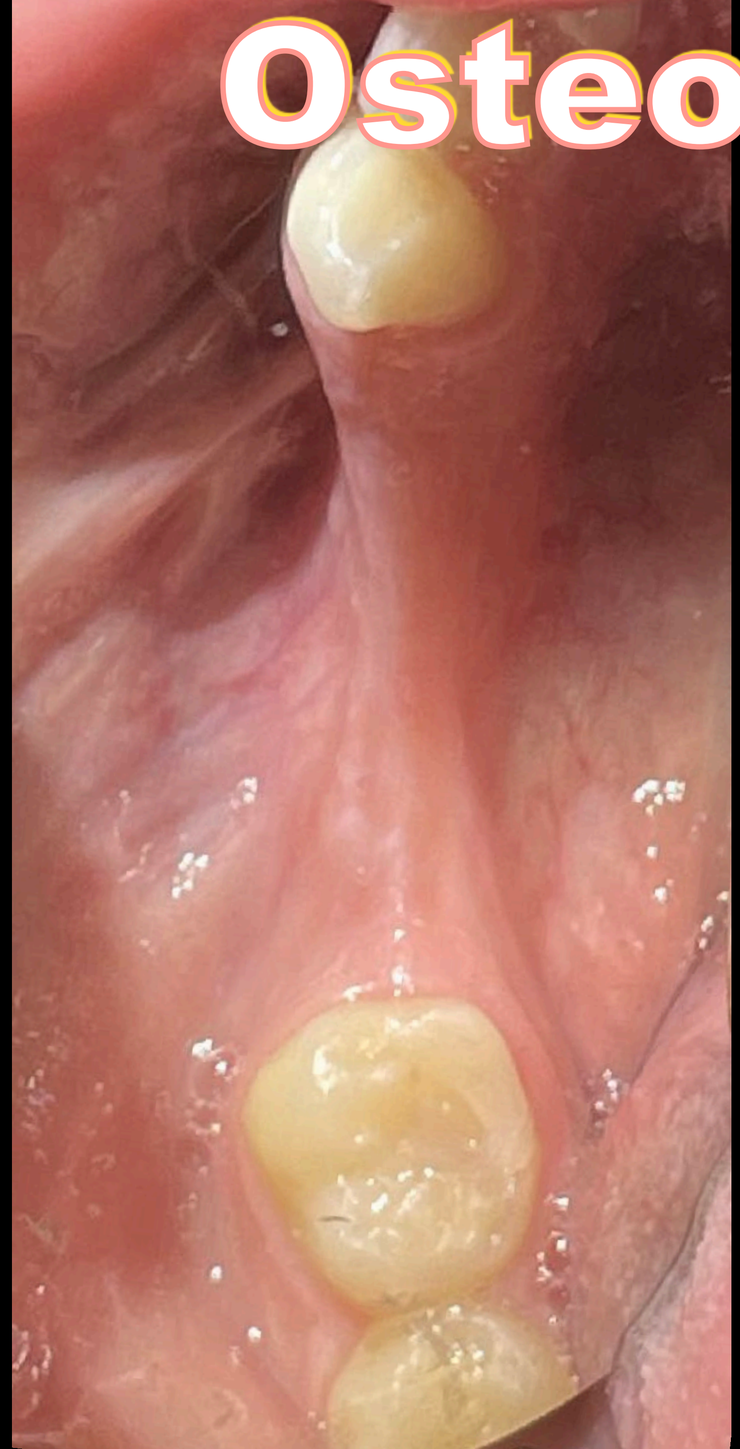

TUCK & ROLL


POST OP

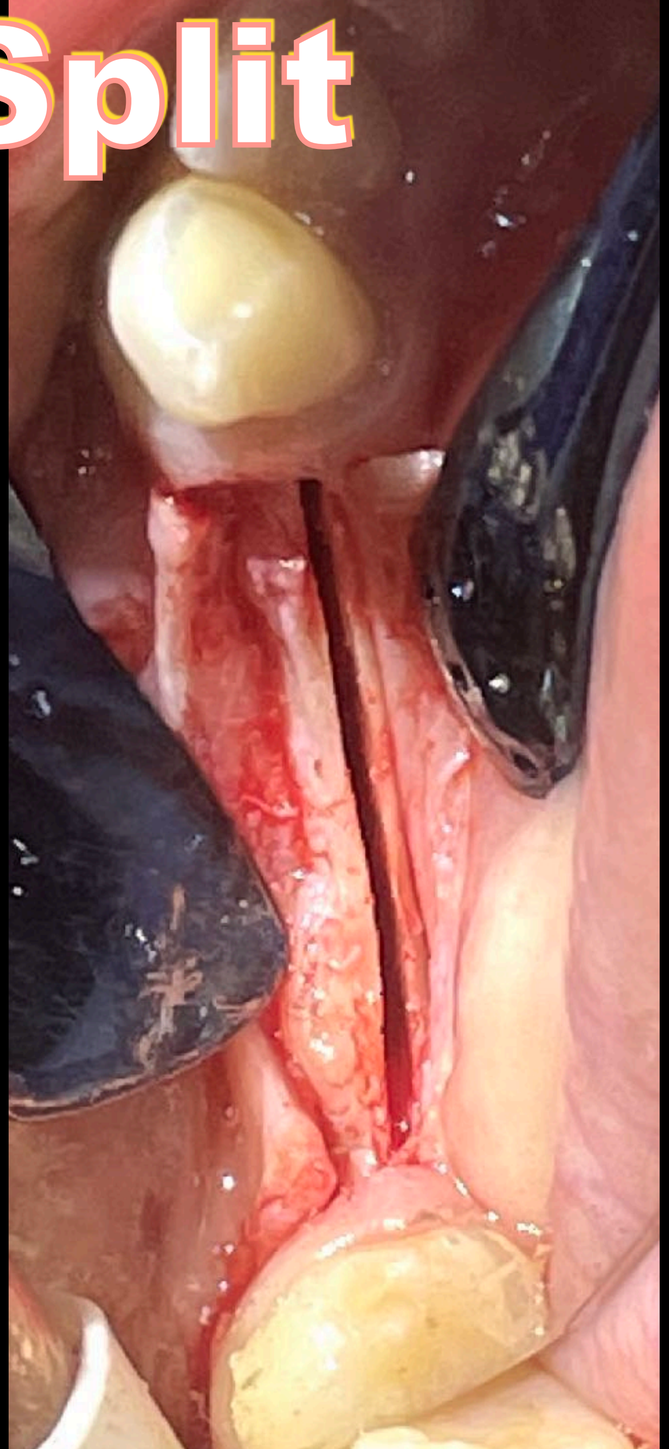

2 WEEK POST OP

Hard/Soft Tissue Regeneration

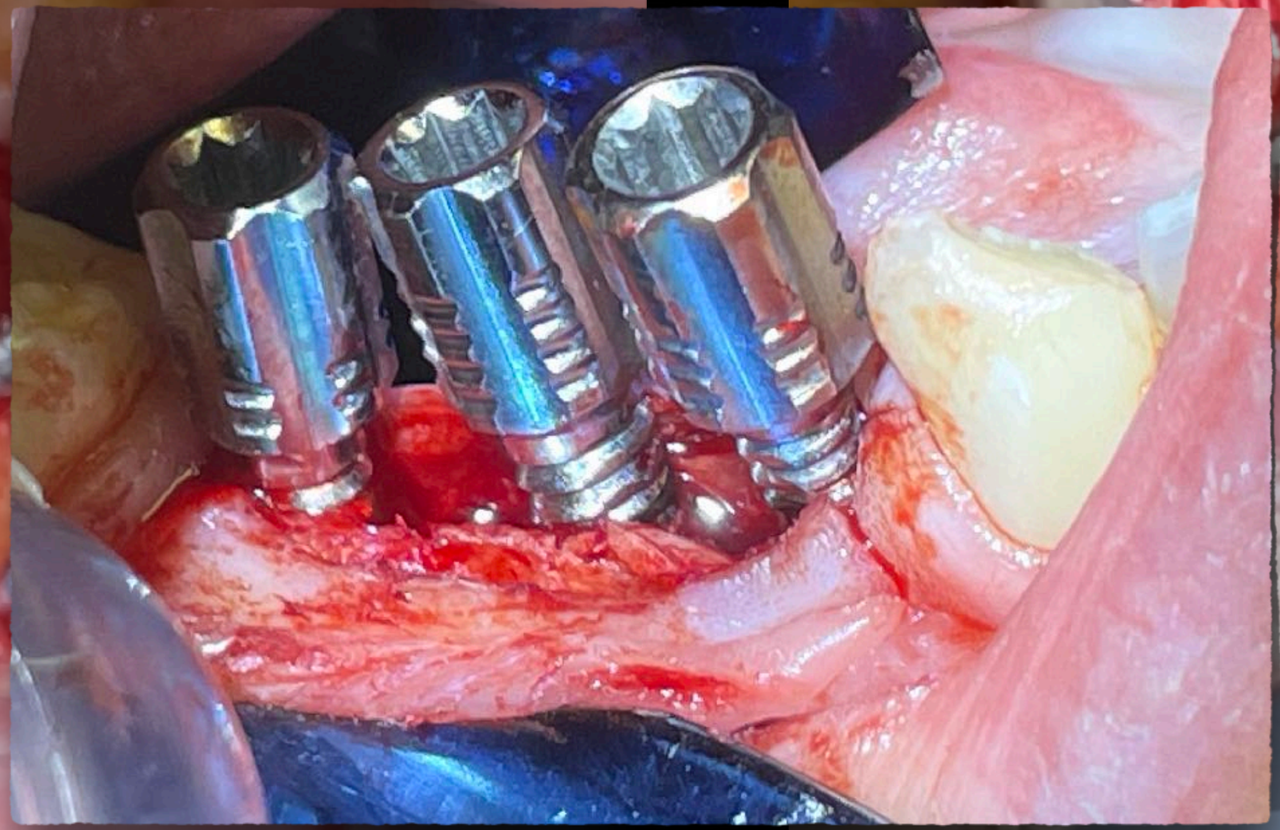
Osteoperiosteal Split



Osteoperiosteal Split



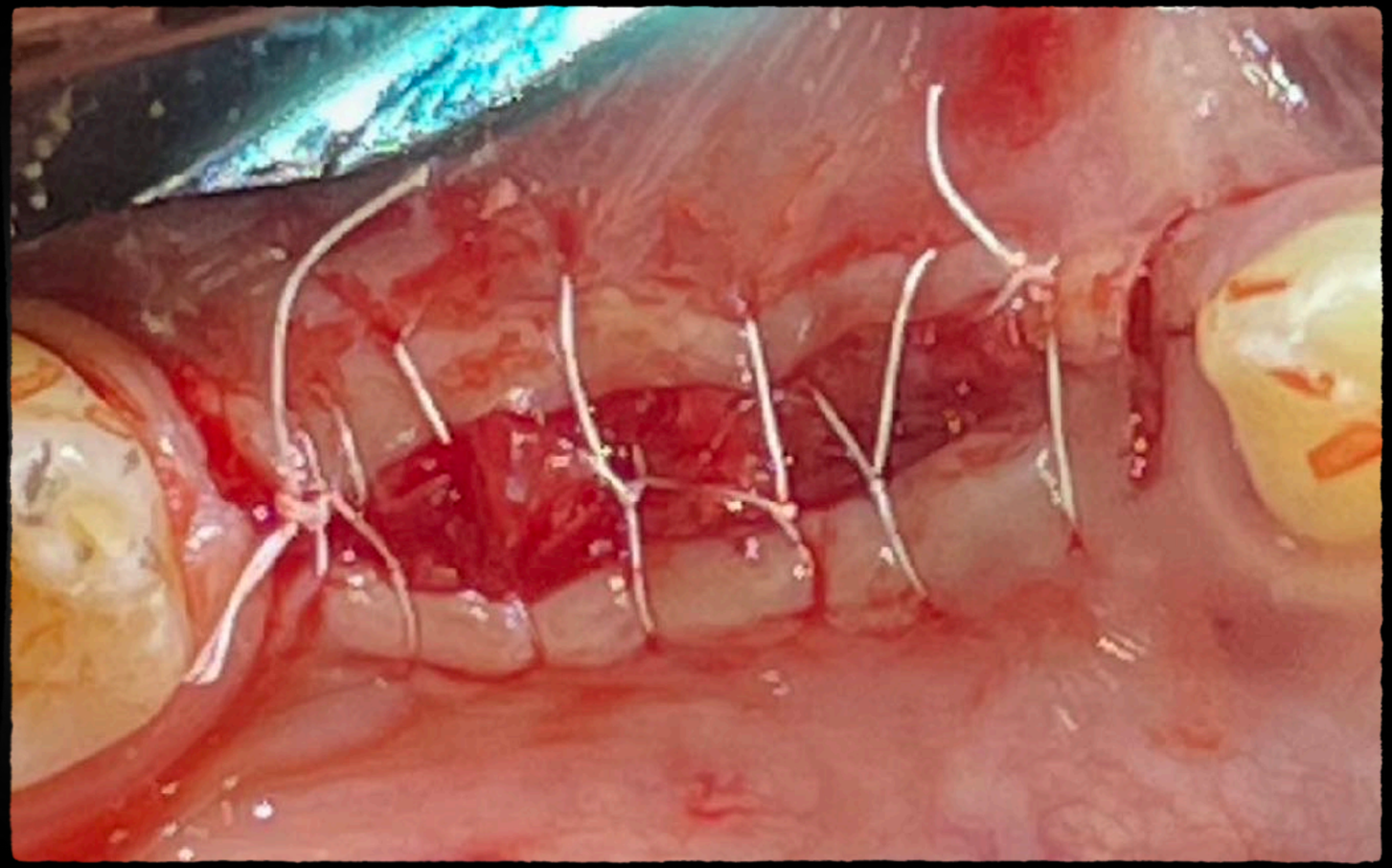
Osteoperiosteal Split



Non-primary Closure

BioXclude®

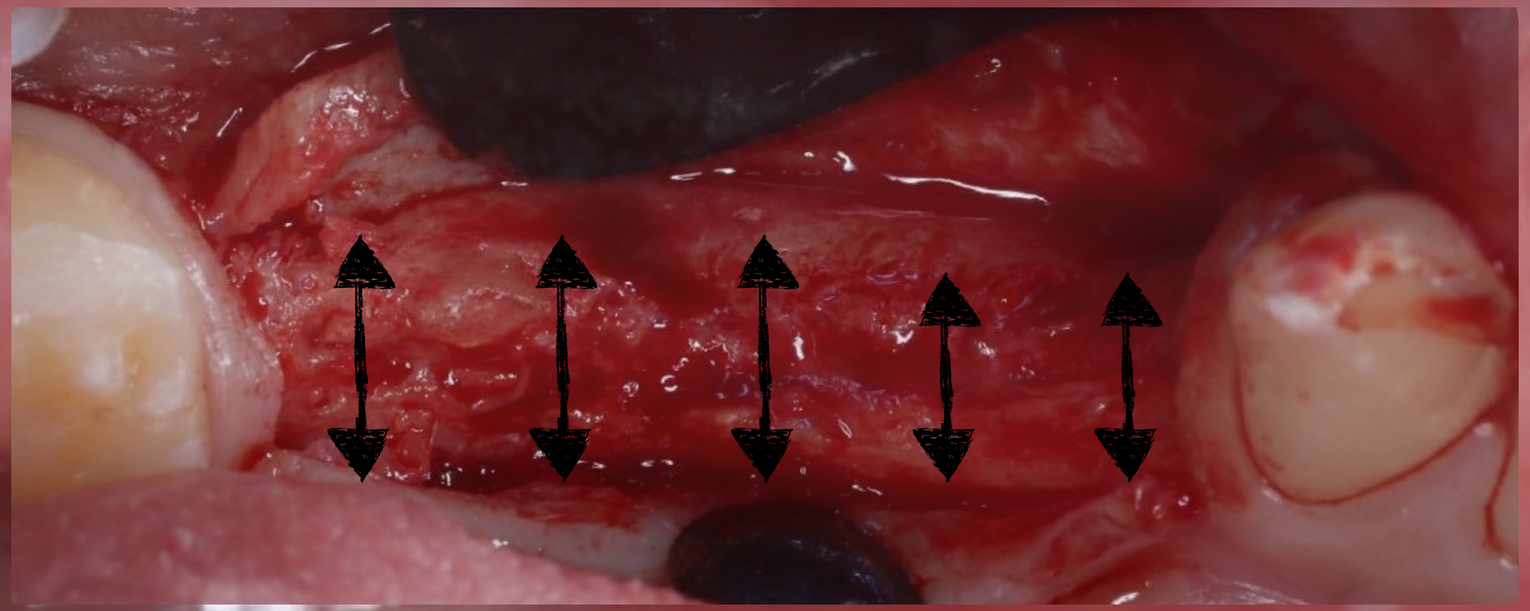
Non-primary Closure

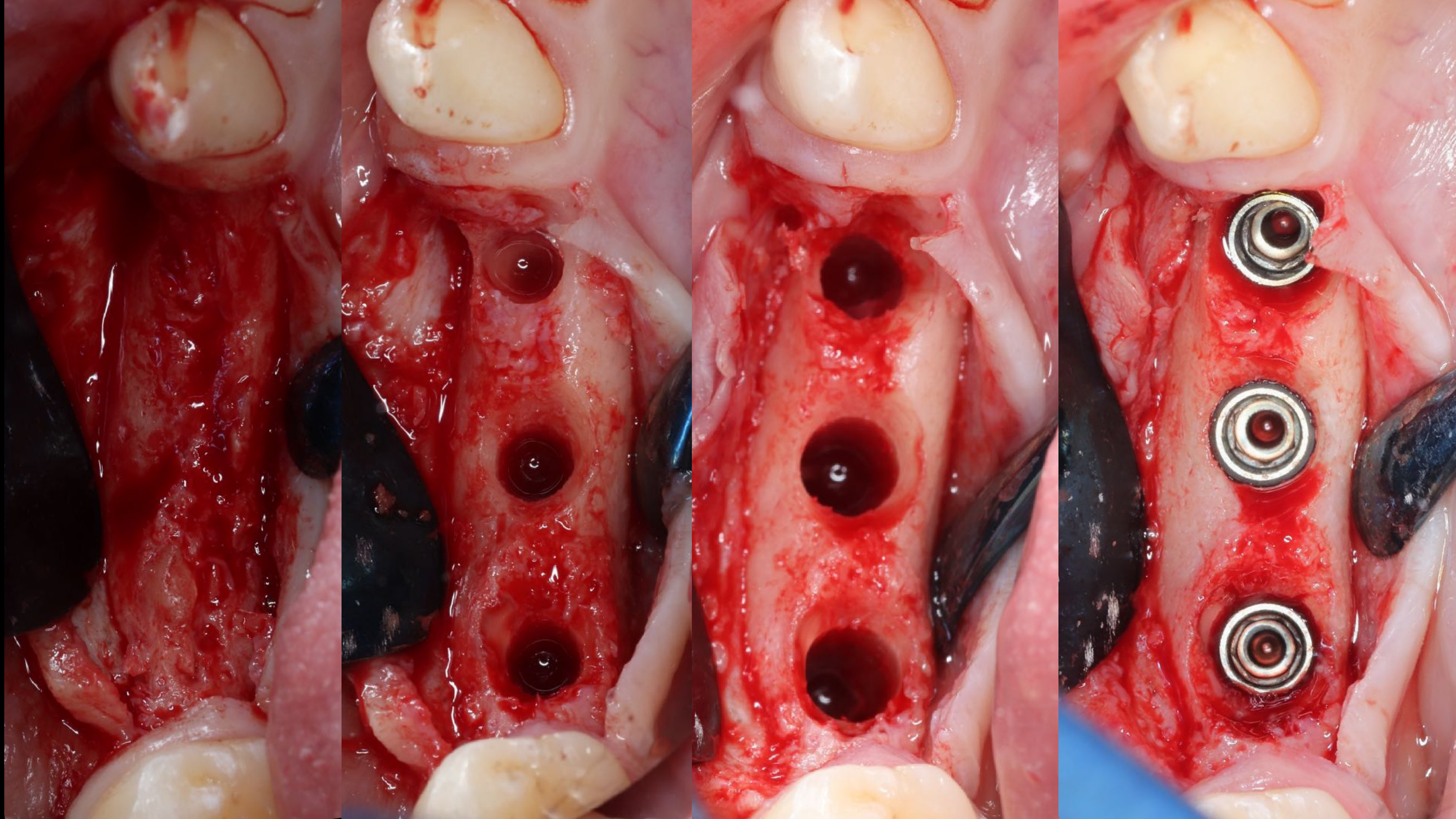


BioXclude®


10 Day Post op
Non-primary Closure

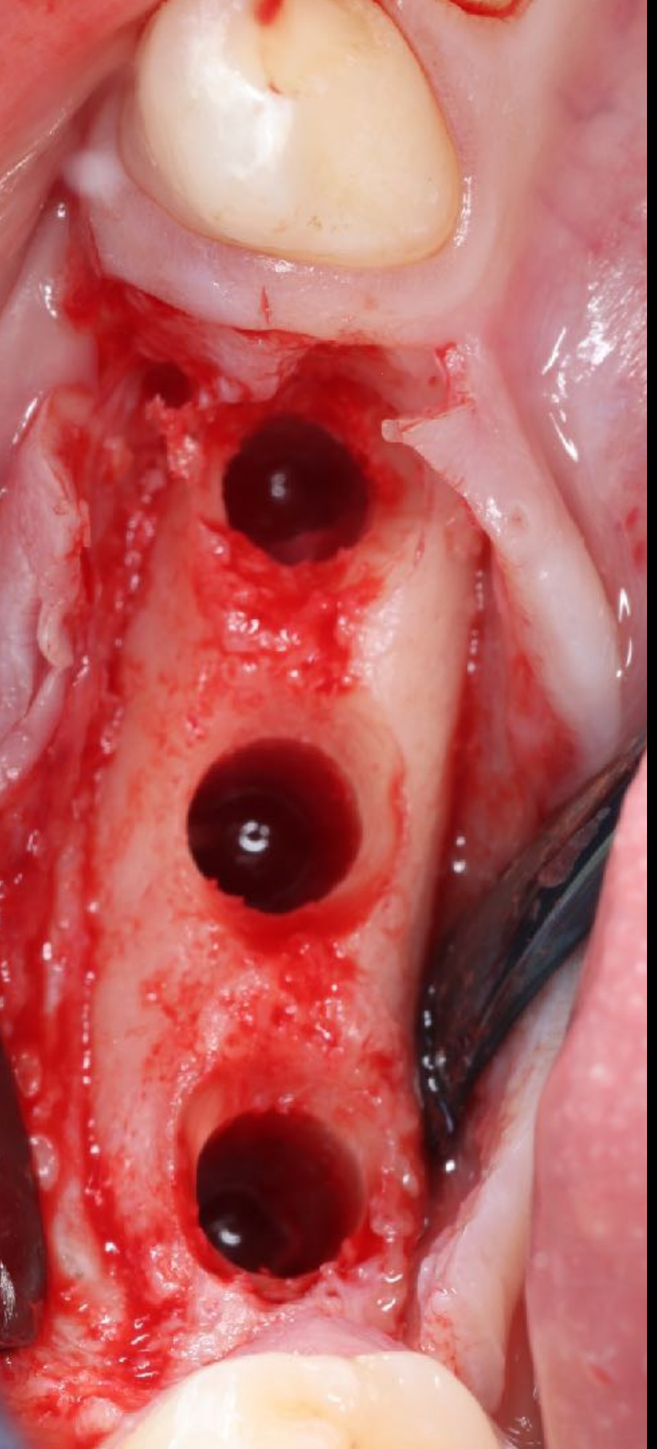
14 week Post op

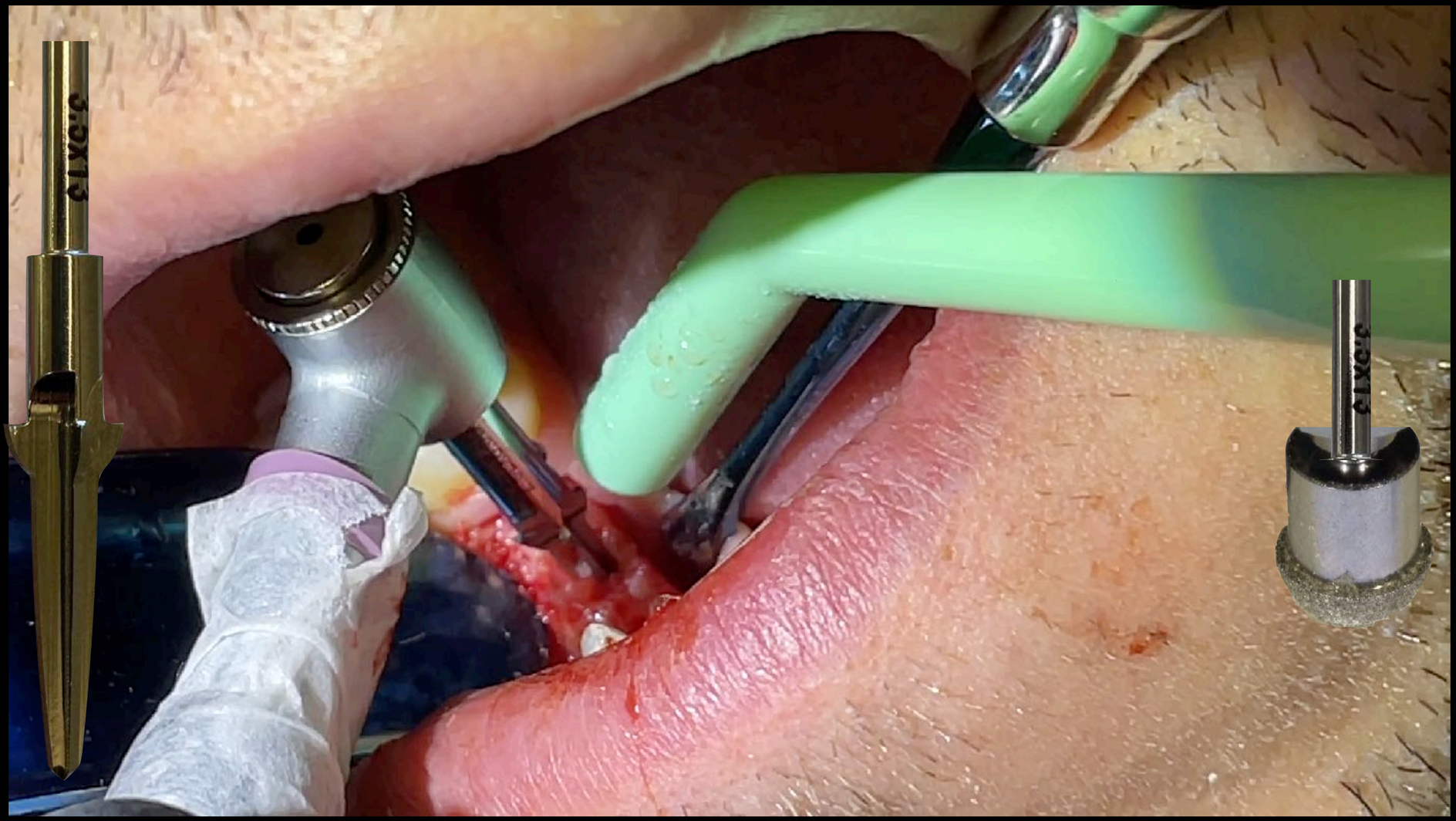




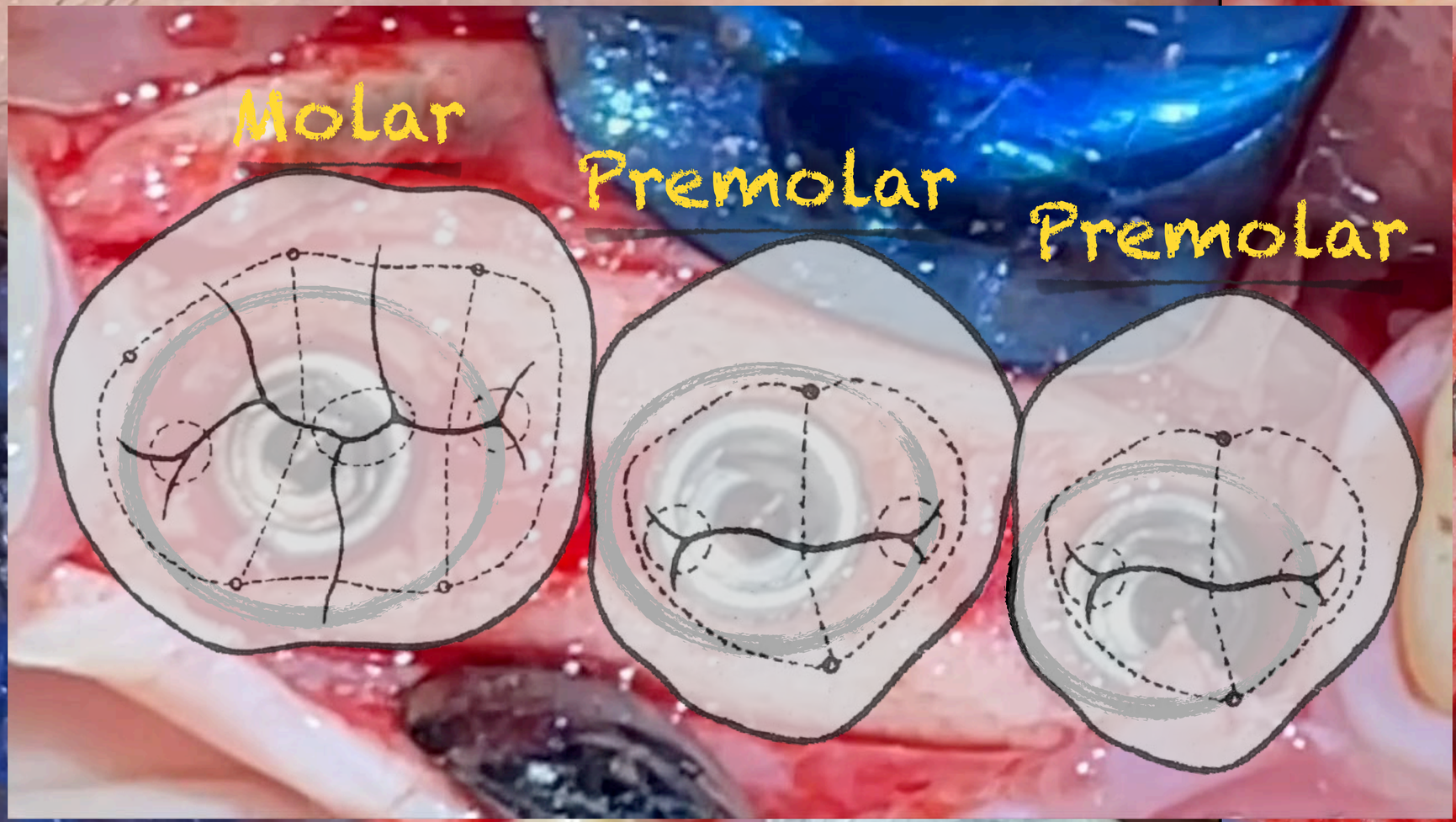

How did we get here?

Its all in the shape

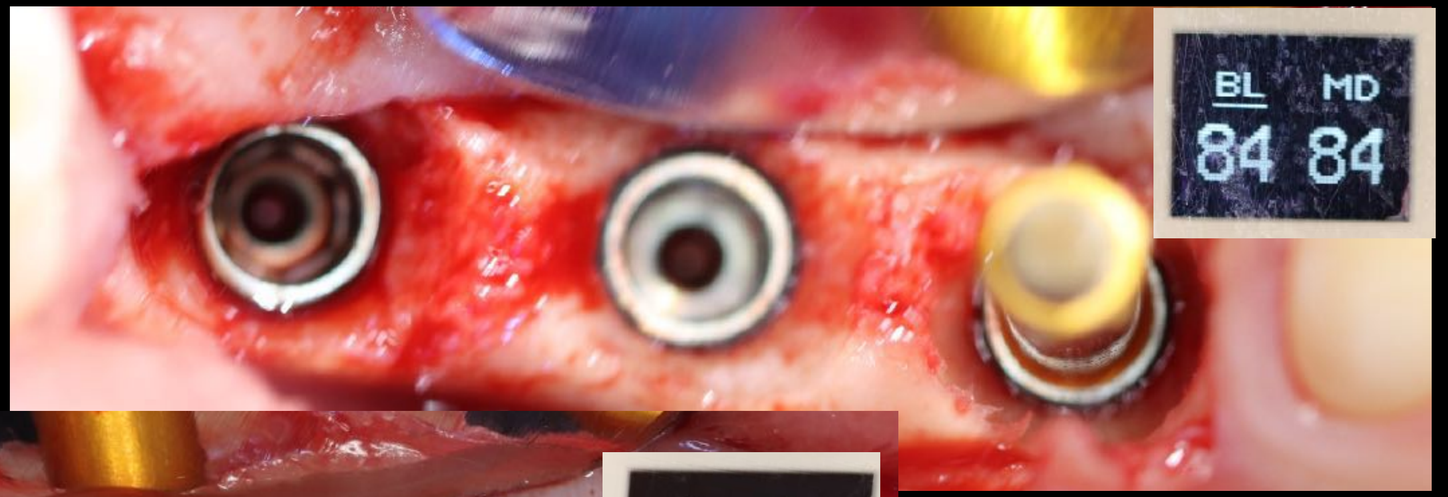


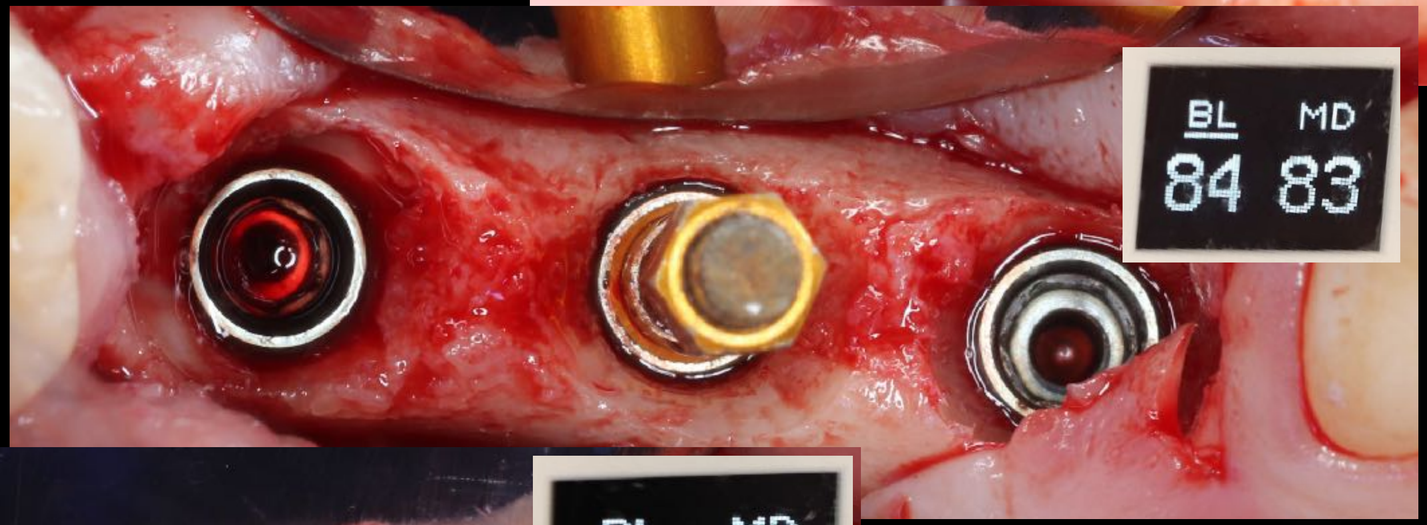


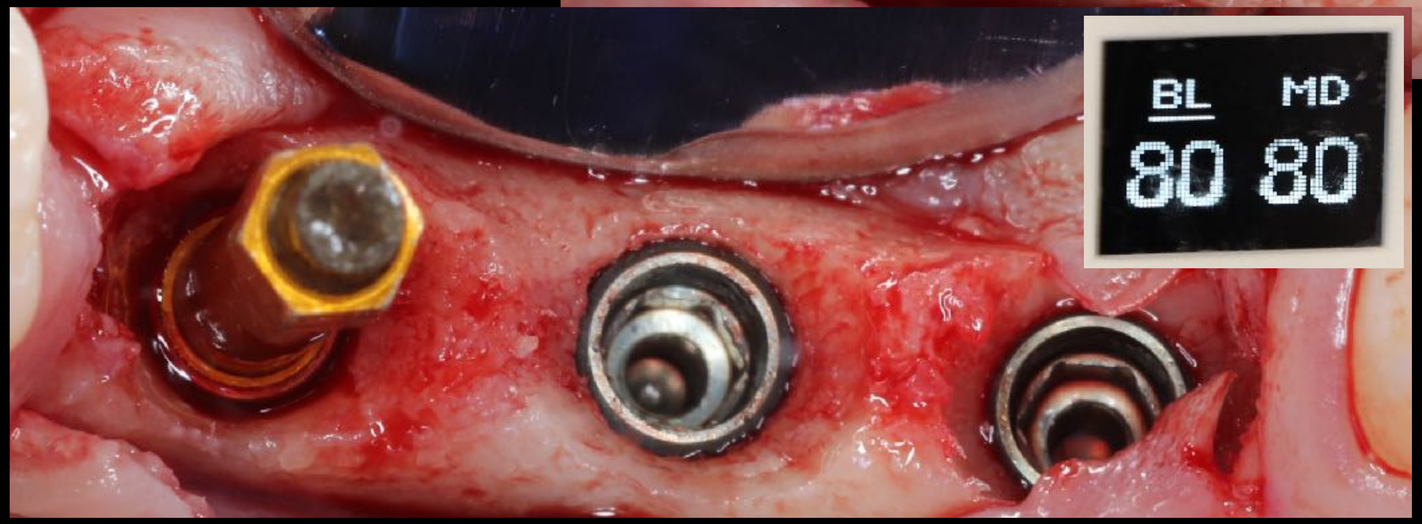
Implants



ISQ

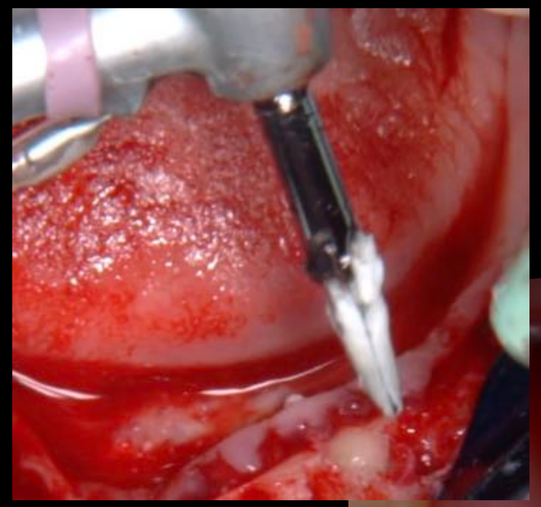


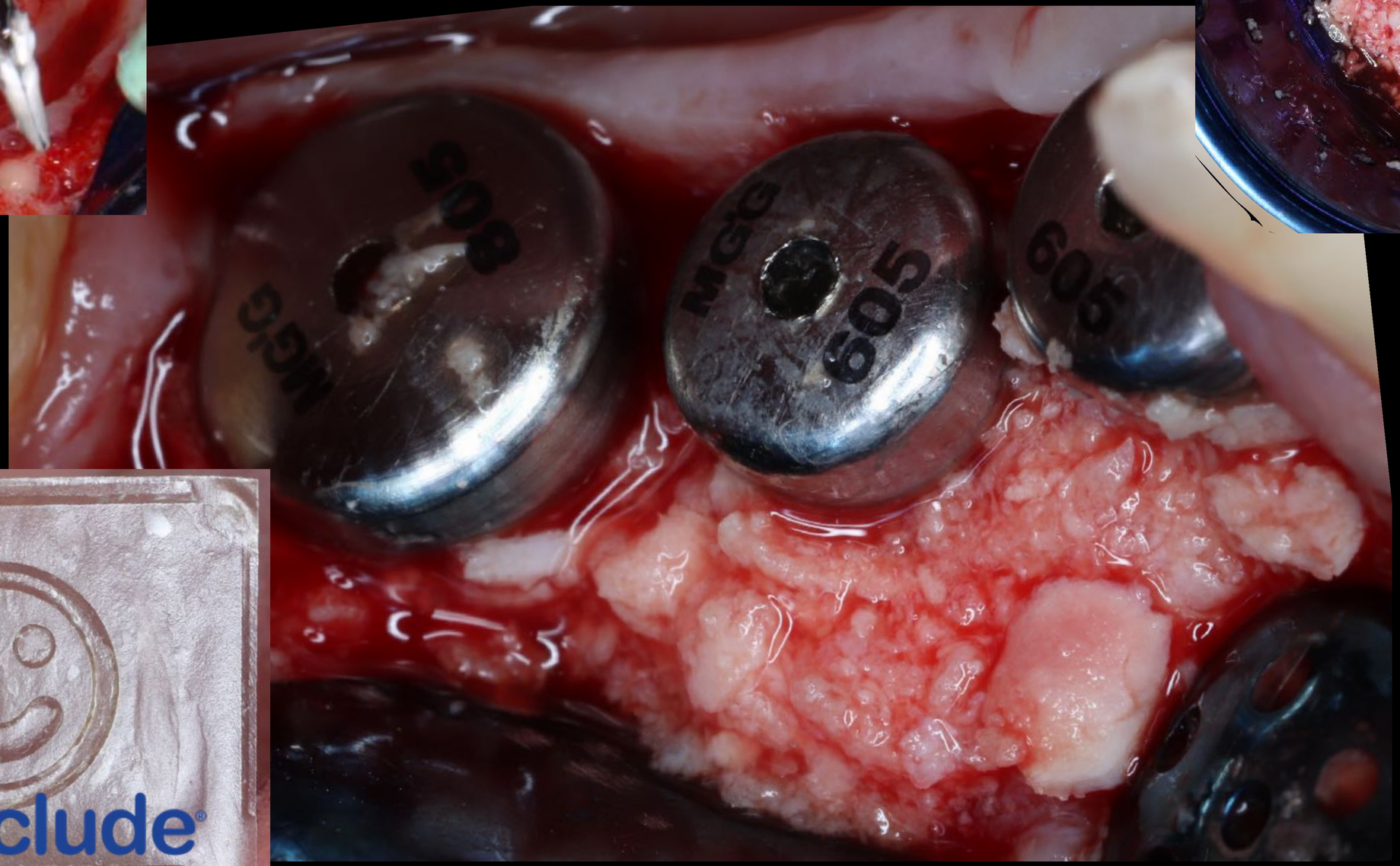


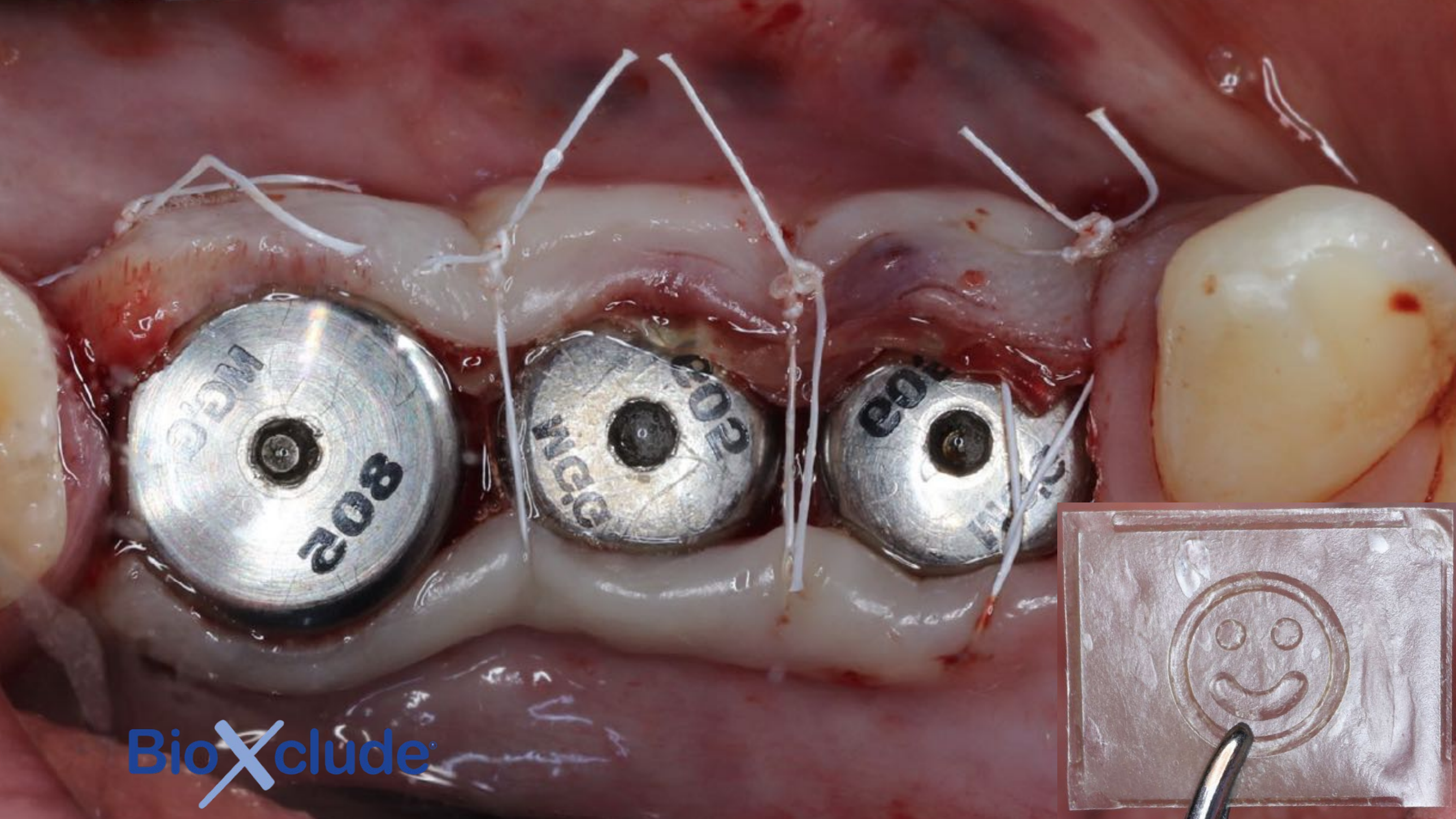


Esthetic healing abutments

Autograft

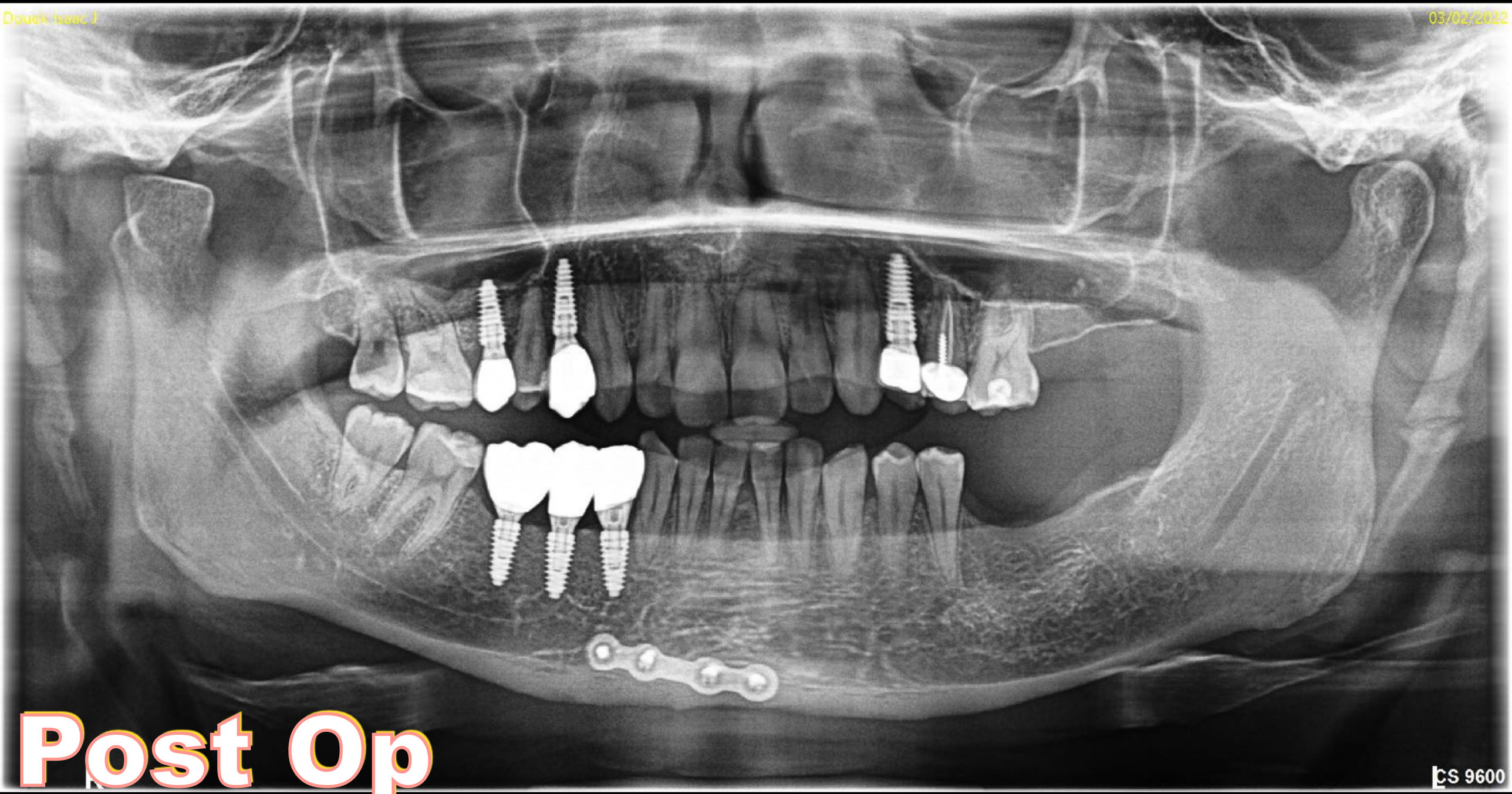


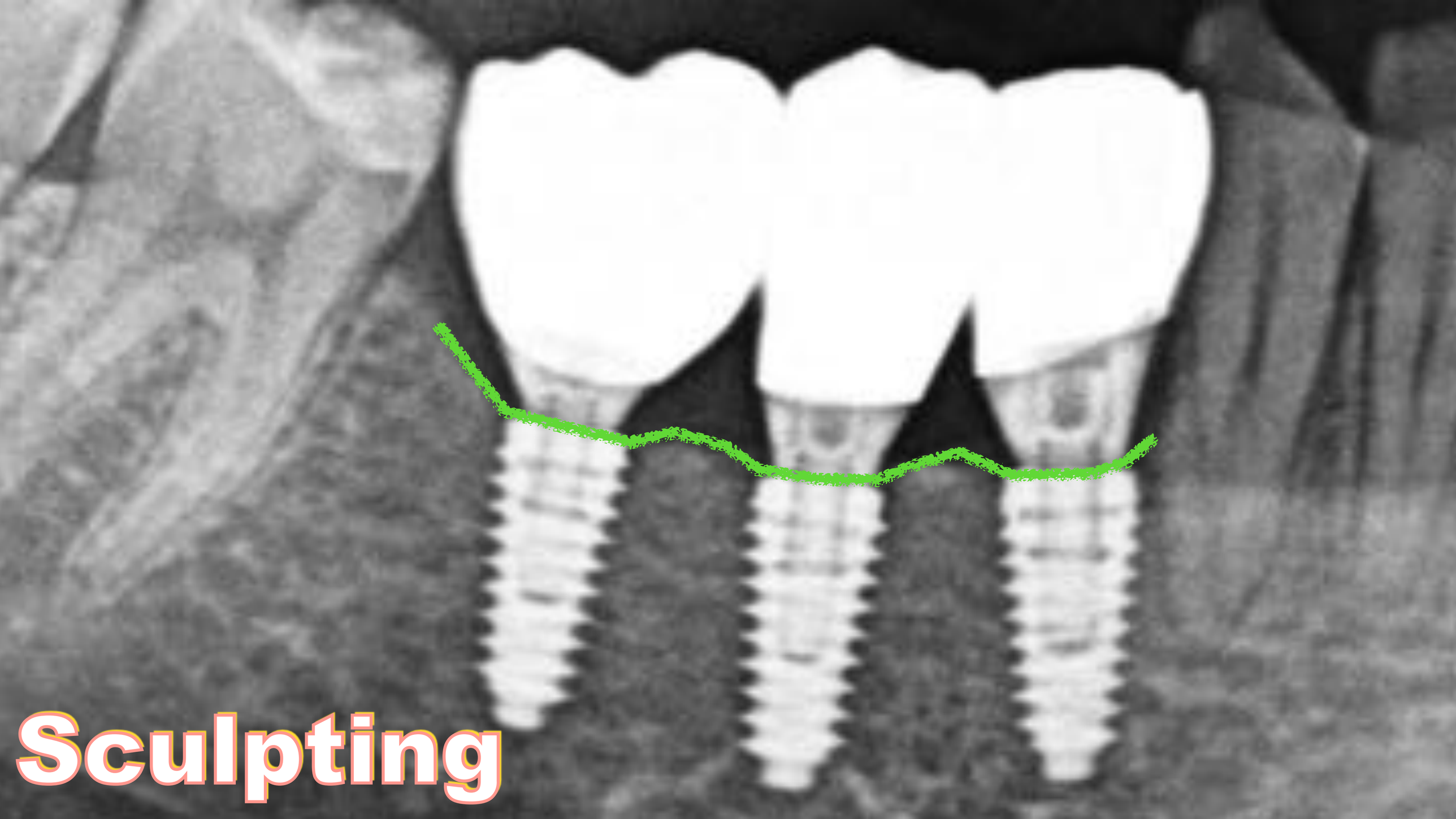



BioXclude


MGTG


Soft Tissue Healing


Douek Isaac J
03/02/2022
Post Op
CS 9600


Sculpting

Final Restorations

Partial Extraction Therapy

this could change everything

Hurzeler,Zuhr etl; The socket shield technique: a proof principle report.
J Clin Perio. 37(9):855-62, Sept 2019

Nordland & Tarnow, 1998

New Tools

Courtesy: Miguel Stanley DDS

FUTURE DIRECTIONS

Partial Extraction Therapies

"PET" Partial Extraction Therapies is a term first described on Dentalxp.com in 2015 that encompasses any and ALL terms and procedures that involve the maintenance or utilisation of all or parts of the tooth root, PDL and cementum above and below the alveolar bone to preserve ridge form and soft tissue levels.

This first started as "SRT" Submerged Root Technique in 2007 Salama & Ishikawa and then onto "SS" Socket Shield in 2010 Hurzeler & Zuhr, "Root Membrane Technique" in 2014 Mitsias & Siormpas, "PS" Pontic Shield in 2014 Glocker and then in 2016 Gluckman & Salama.

Kan et al., 2013
International Journal
of Periodontics &
Restorative Dentistry
33.1 (2013).

FUTURE DIRECTIONS

PARTIAL EXTRACTION THERAPIES

Pontic Shield

Root Membrane

J-shield

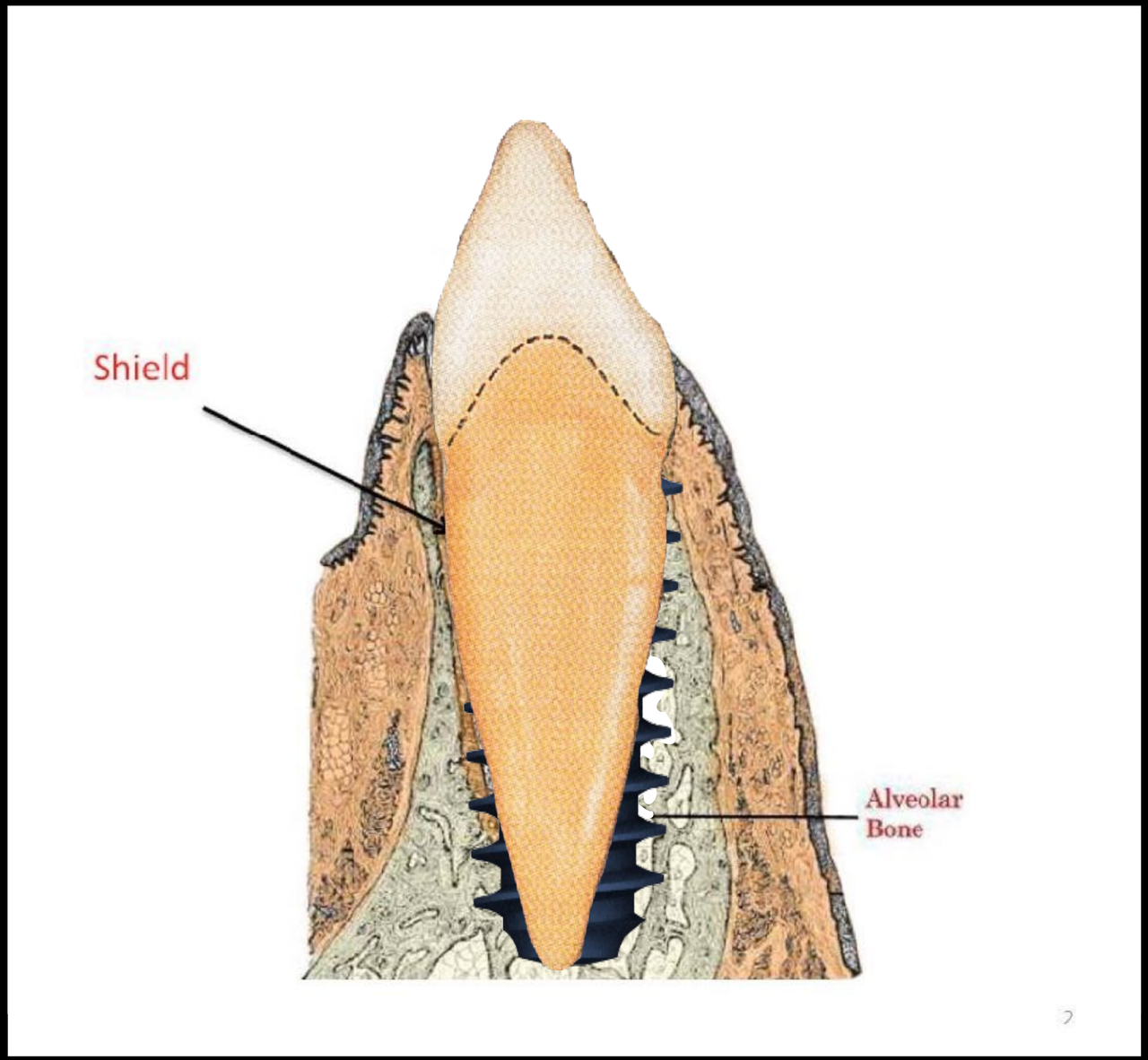
Root Submergence

Socket Shield

Proximal Socket Shield

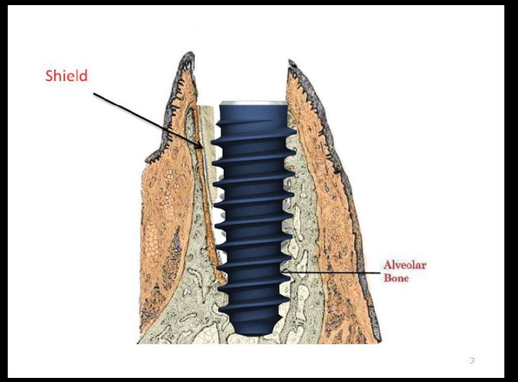
Root Membrane
Partial Extraction
Therapy
Socket Shield
Pontic Shield

*Requires ankolytic root



AIE
Advanced Implant Educators

Root Membrane
Partial Extraction
Therapy
Socket Shield
Pontic Shield



AIE
Advanced Implant Educators

Immediate Implant Placement in the Esthetic Zone Utilizing the "Root-Membrane" Technique: Clinical Results up to 5 Years Postloading

Konstantinos D. Siormpas, DDS[1]/Miltiadis E. Mitsias, DDS, MSc, PhD[2]/
Eleni Kontsiotou-Siormpa, DDS[3]/David Garber, DMD[4]/Georgios A. Kotsakis, DDS[5]

Purpose: *To clinically evaluate immediate implant placement with simultaneous intentional retention of the buccal aspect of the root and to report longitudinal data on survival of implants placed with the use of this novel technique.* **Materials and Methods:** *A retrospective case series of implants placed with the root-membrane technique in the maxillary anterior region of adult patients was conducted. Clinical and radiographic analysis was performed to assess implant success and to evaluate the survival of the retained root fragment based on predetermined criteria. A Kaplan-Meier method analysis was used to estimate the 5-year success rate of implants placed with this technique.* **Results:** *Data from 46 patients (median follow-up time, 40 months; range, 24 to 60 months) were evaluated. Each patient contributed one implant site in this study. All implants successfully maintained osseointegration at the end of the follow-up period for a 100% cumulative survival rate, based on clinical and radiographic criteria. Radiographic examination revealed good crestal bone stability with mean crestal bone loss on the mesial and distal aspects of the implants estimated to be 0.18 ± 0.09 mm and 0.21 ± 0.09 mm, respectively. The only complication noted in this patient cohort was apical root resorption of a single retained root fragment that did not interfere with*

dentalxp

pet research group


HOWIE GLUCKMAN


JONATHAN DU TOIT


MAURICE SALAMA


SNJEZANA POH


MARCELO FERRER

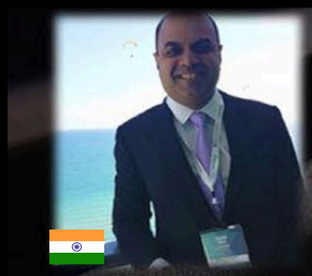

RCIO FONSECA


JOEY CHEN


DAVID GARBER


SALAH HUWAIS


ISAAC TAWIL


UDATTA KHER


HAAKON KUIT


RICHARD MARTIN


JORGE ALIAGA


CHARLES SCHWIMER


ARMANDO PONZI


EHAB MOUSSA


ALI TUNKIWALA


ATILA BODROGI

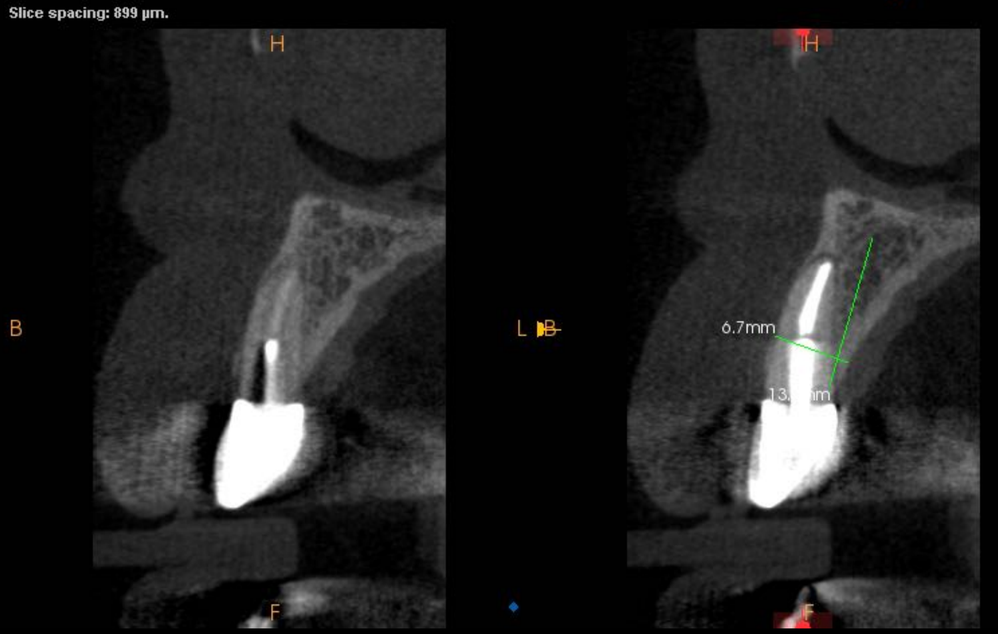
Indications - Contraindications

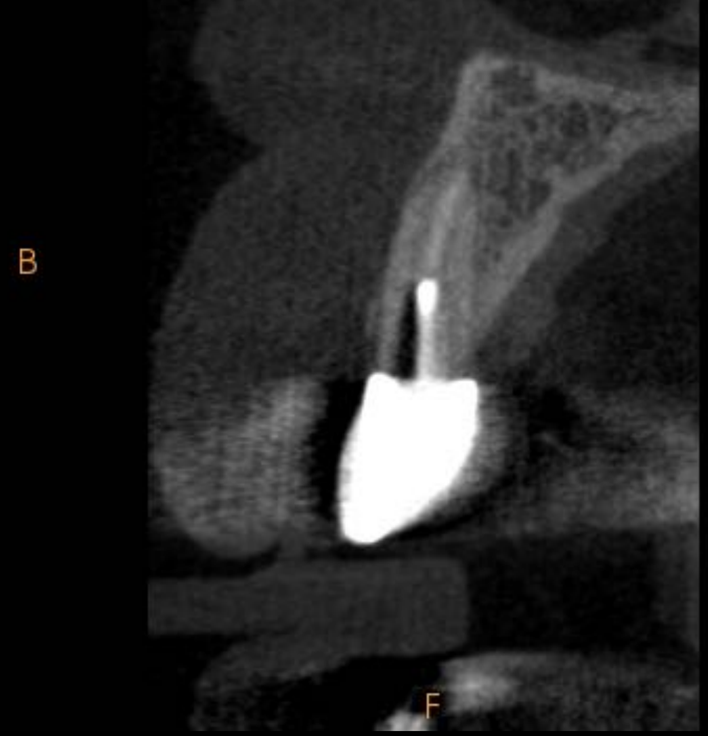
Indications	Contraindications
Patients with good general health and high level of oral hygiene.	Cannot be applied on periodontal teeth.
Teeth with poor prognosis, big carious lesions,	No sub-crestal vertically fractured teeth.
Horizontal fractured teeth, up to bone level.	No periodontally compromised teeth.
Chronic inflammatory teeth-OK	No teeth with acute inflammation.

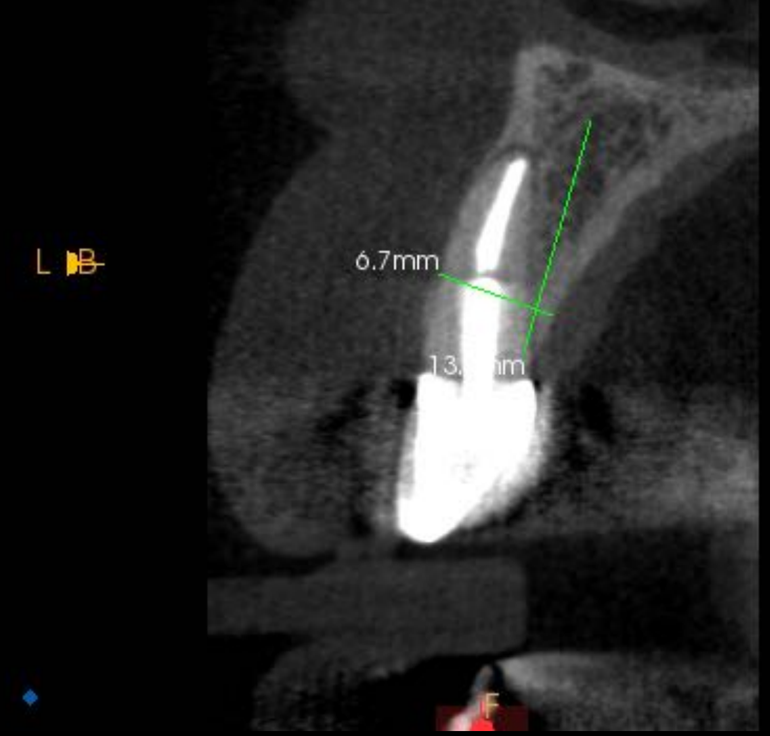

Integration mode: AVG. Slice thickness: 90 µm.
A
R
L
P

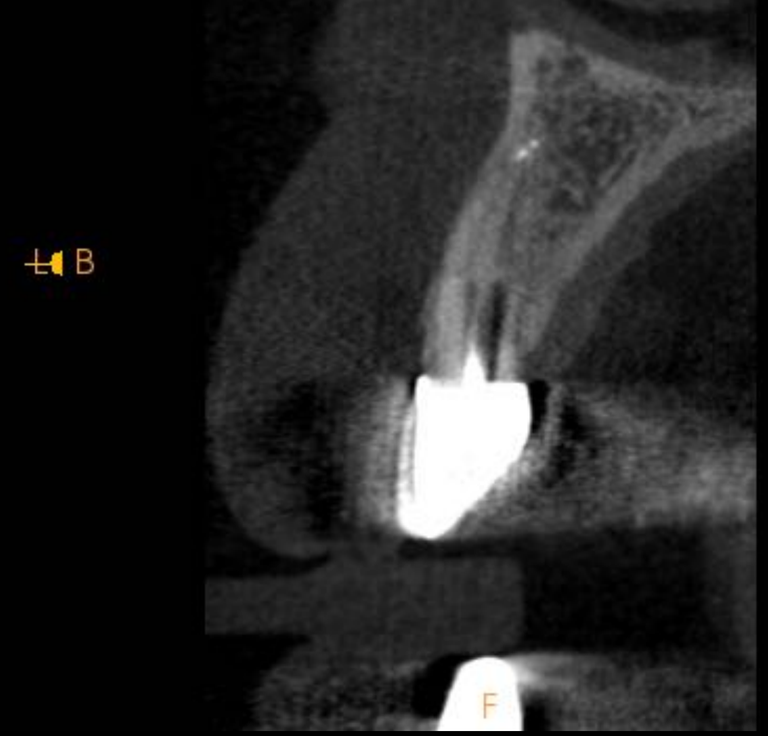

Integration mode: AVG. Slice thickness: 5.0 mm.
H
F


A L

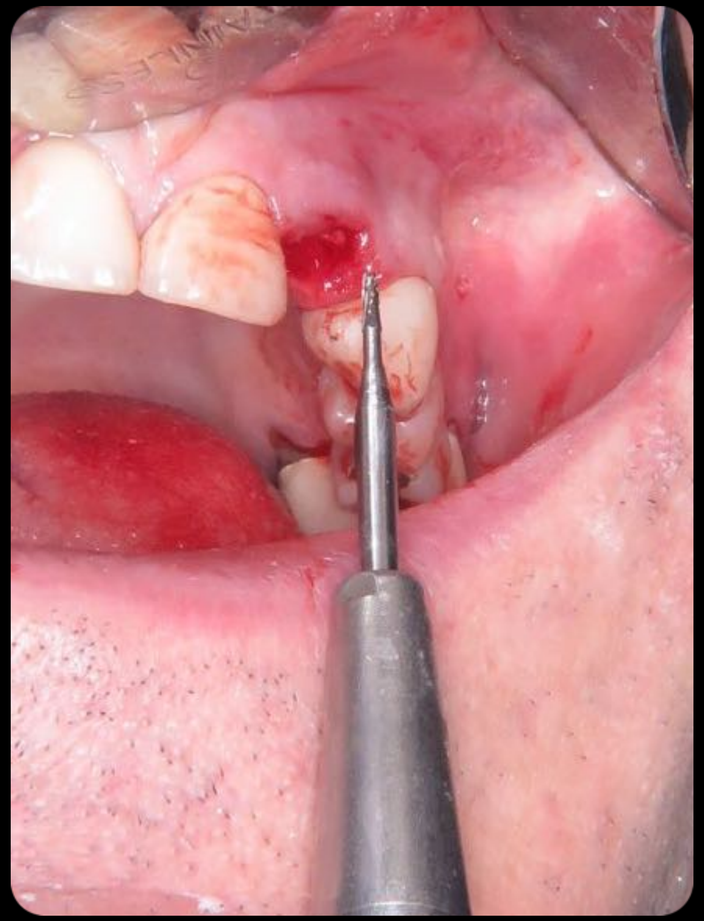

Slice spacing: 899 µm.
H
B
F
H
L
B
6.7mm
F
H
B
L
F

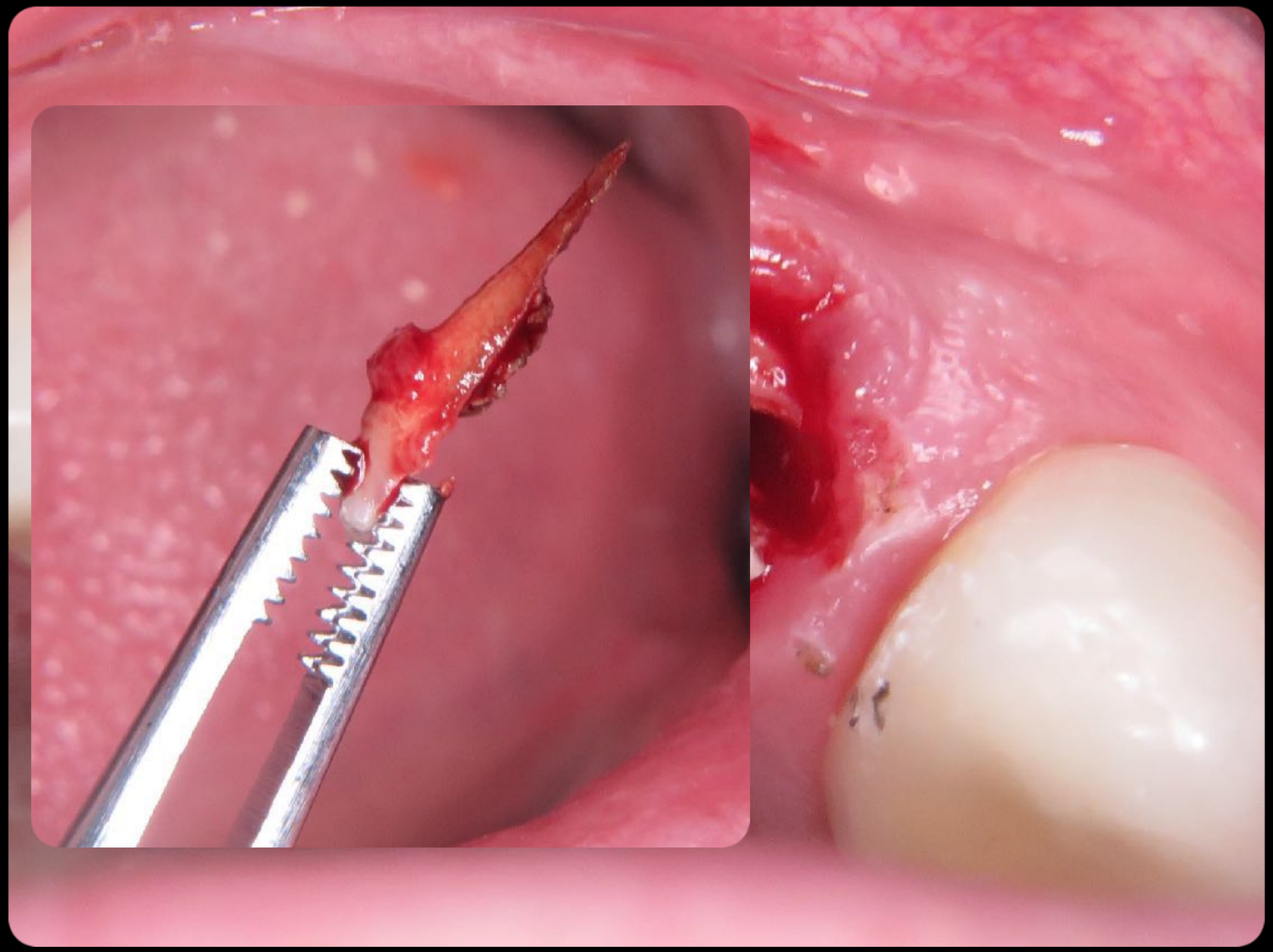

B
F

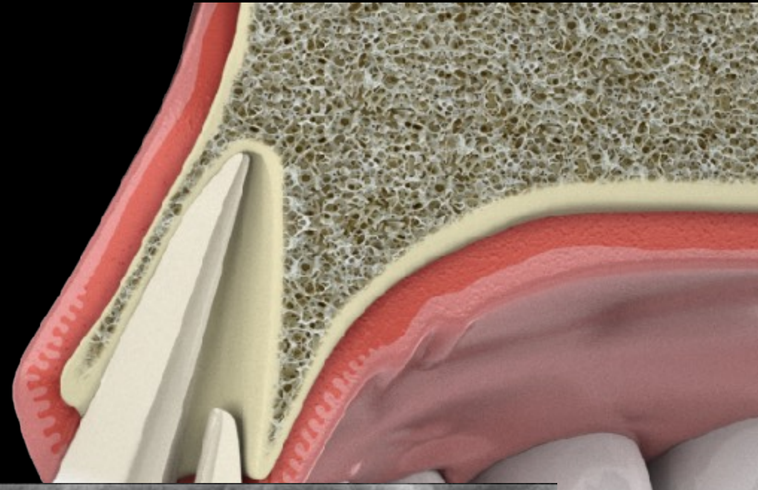

L B
6.7mm
F


B
L
F

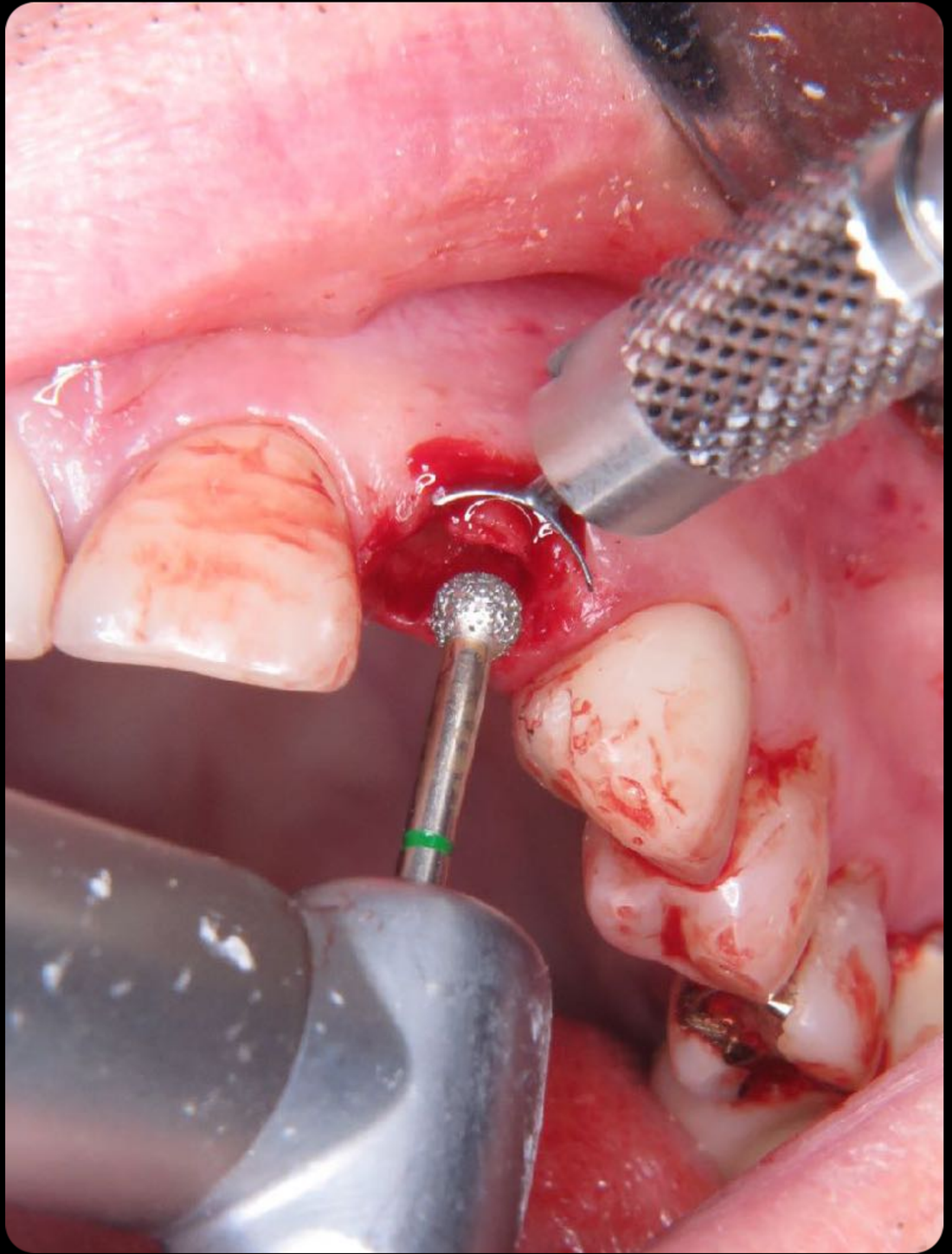
Drill through tooth - Vertical sectioning



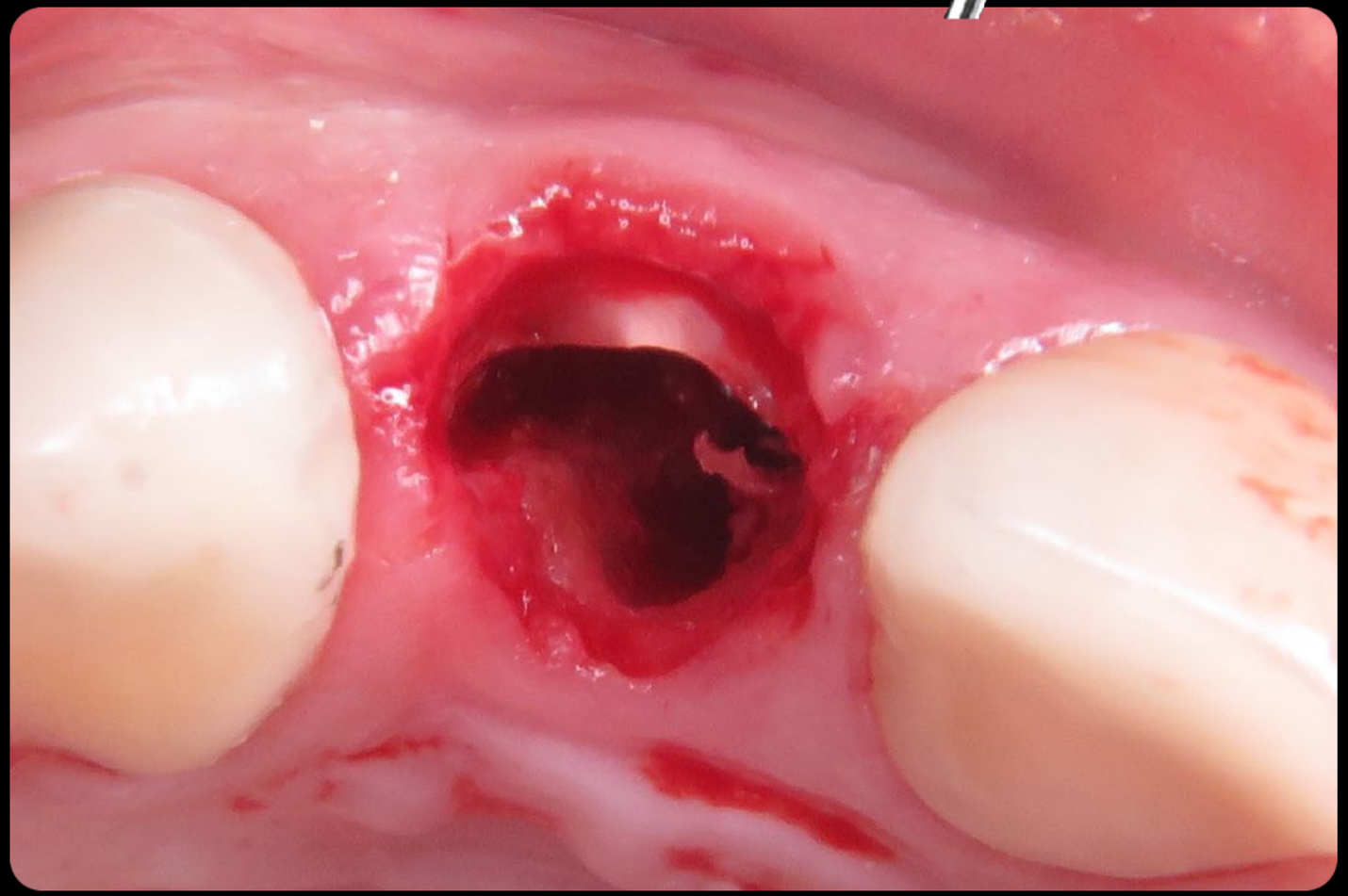




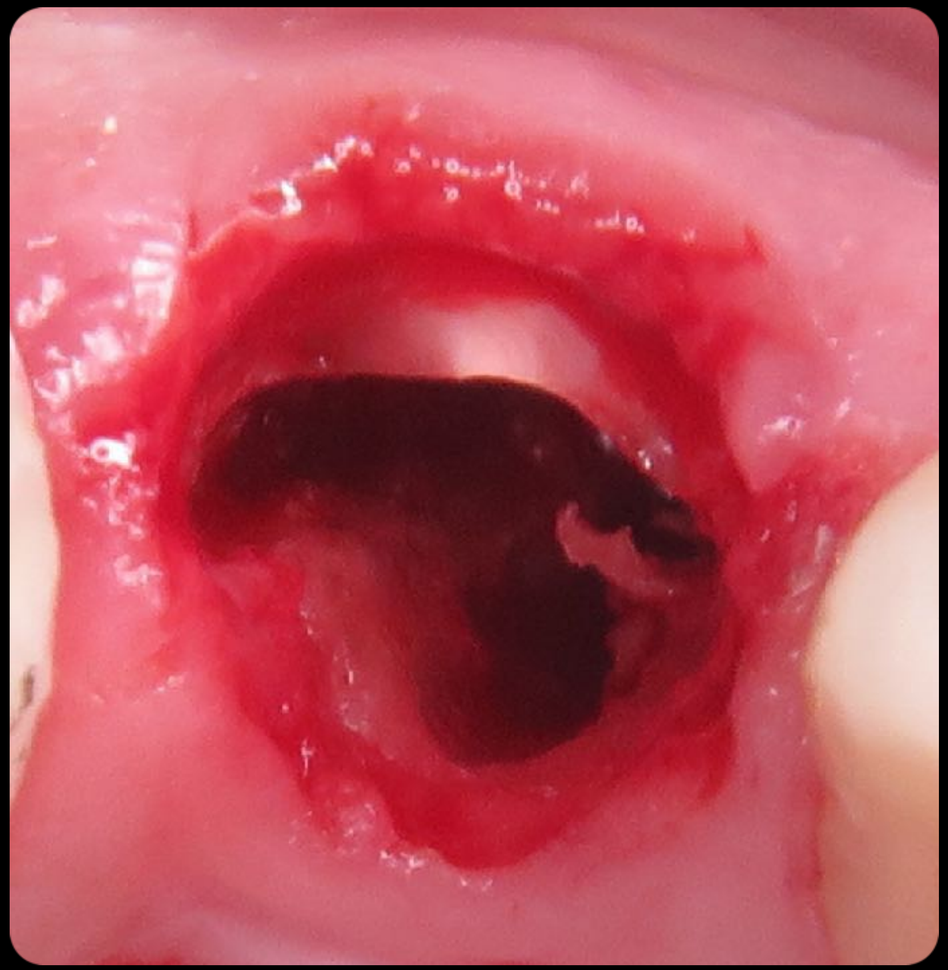
Palatal extraction

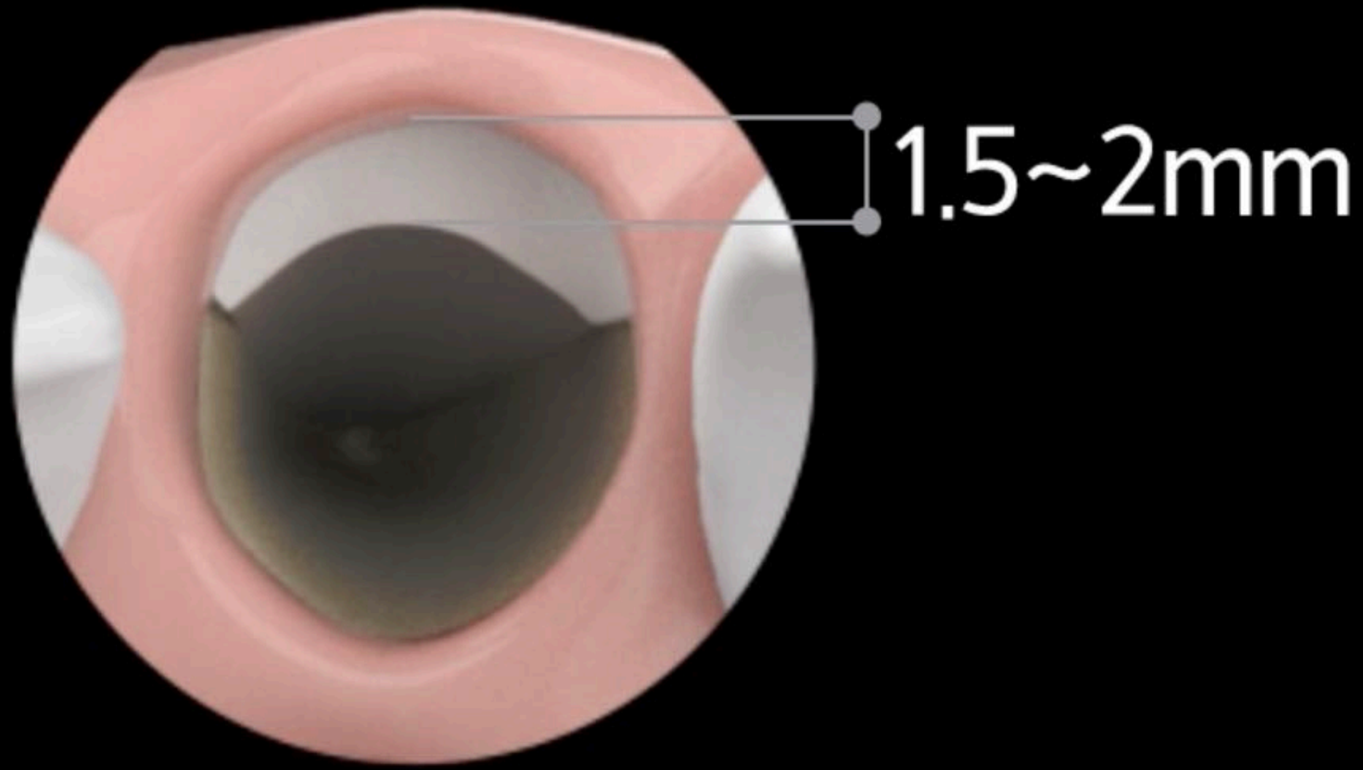


Round bur - Smooth Shield

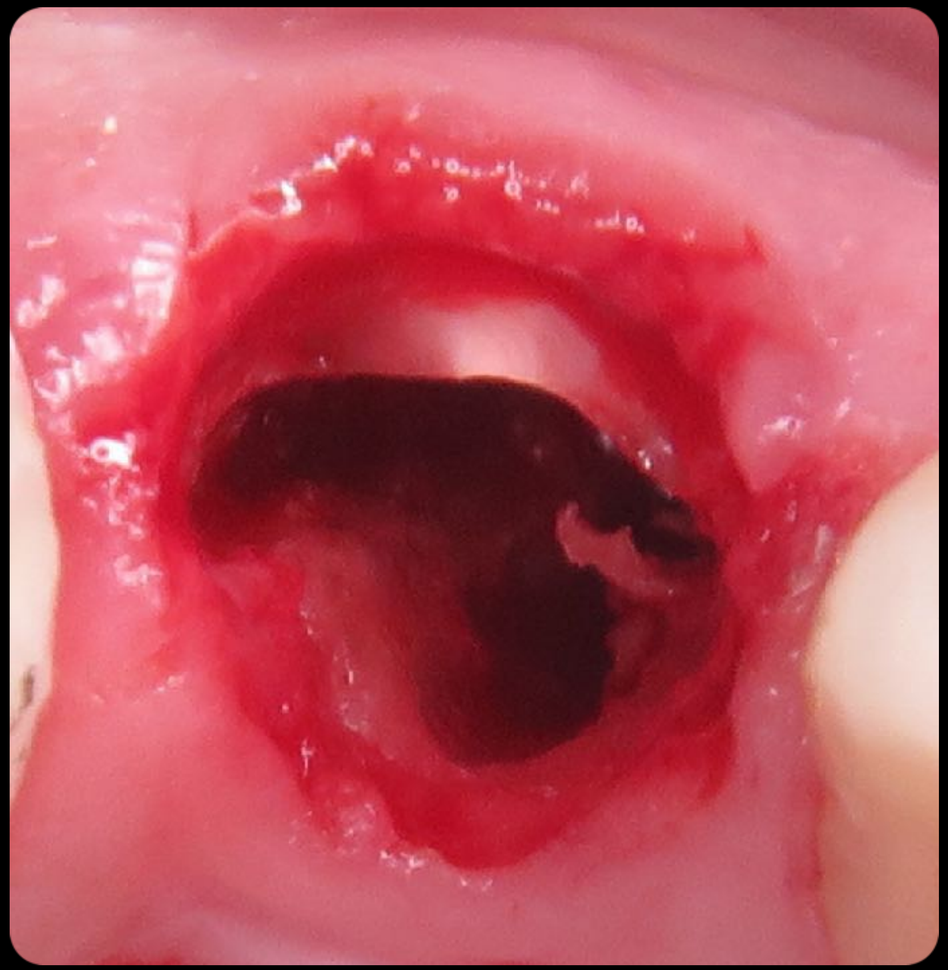


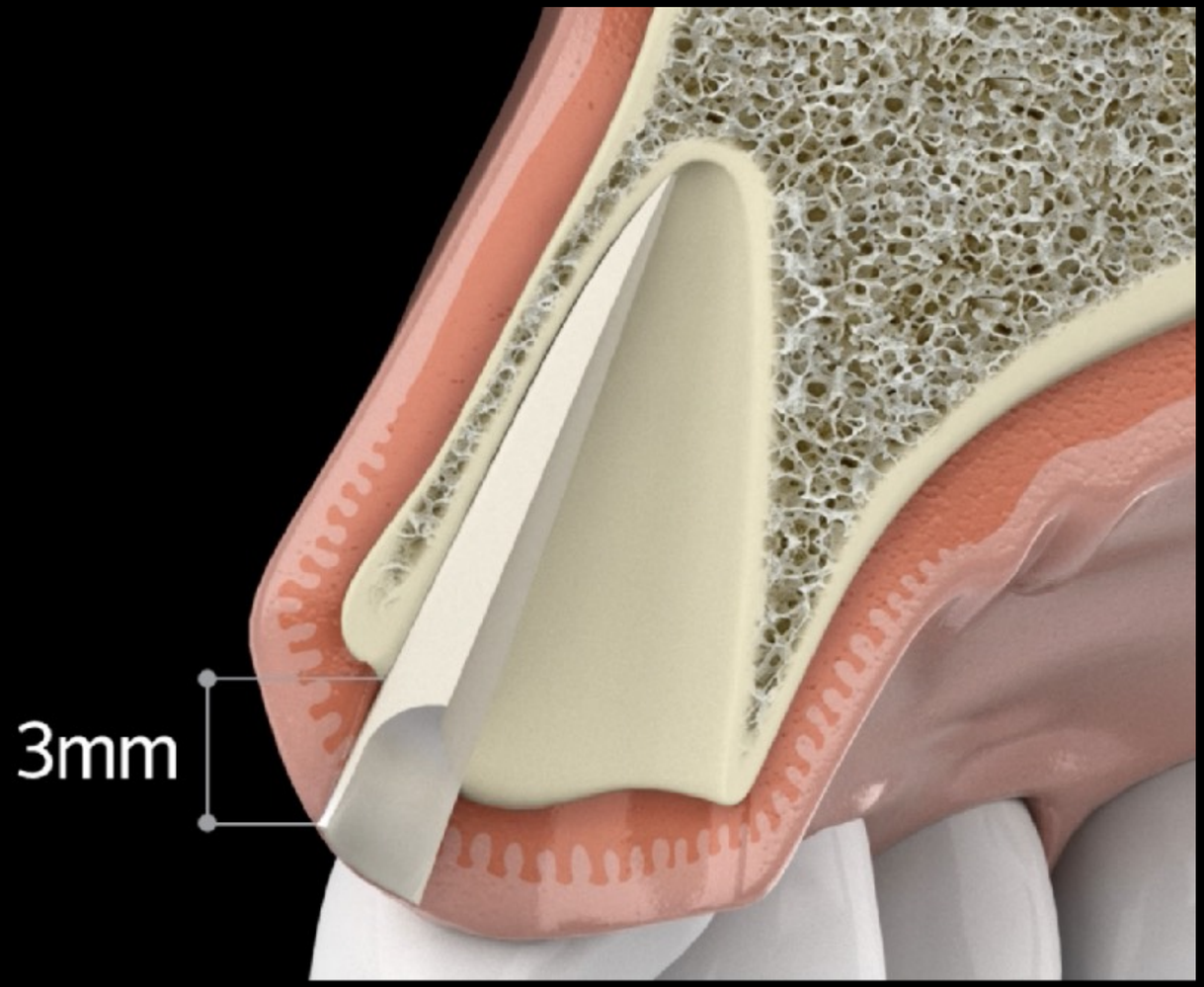
Recommended Width Of root fragment



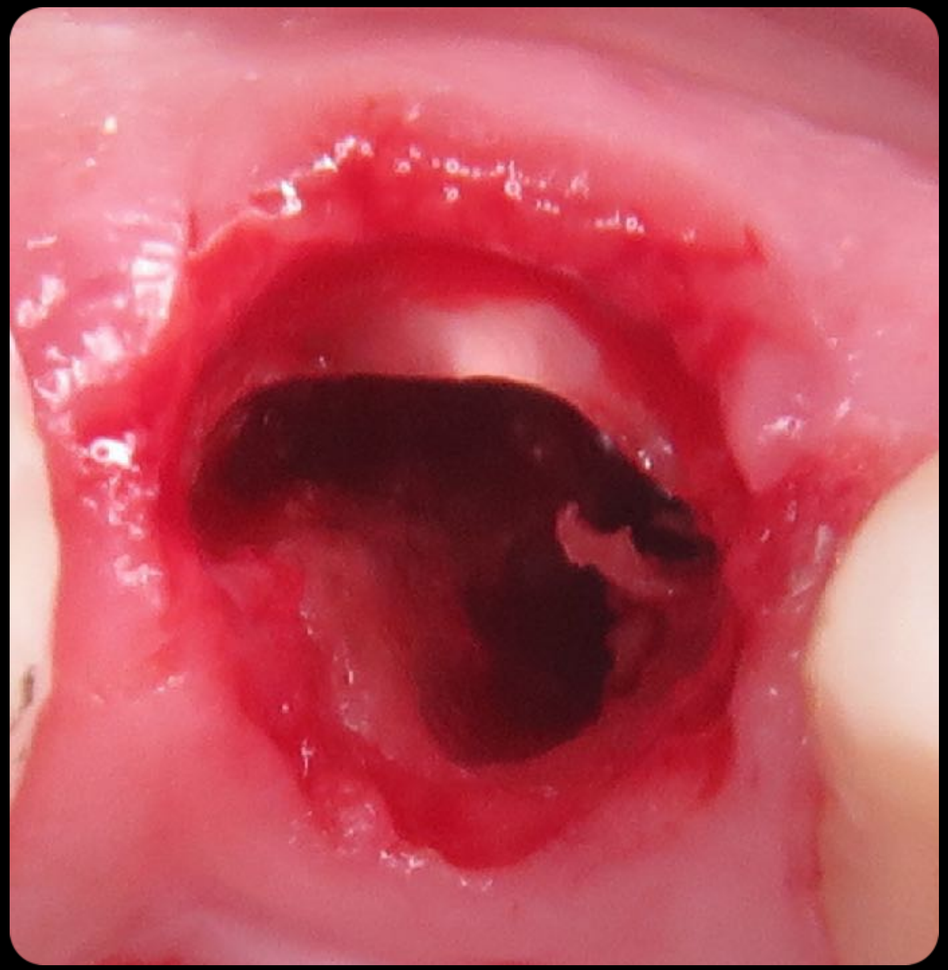


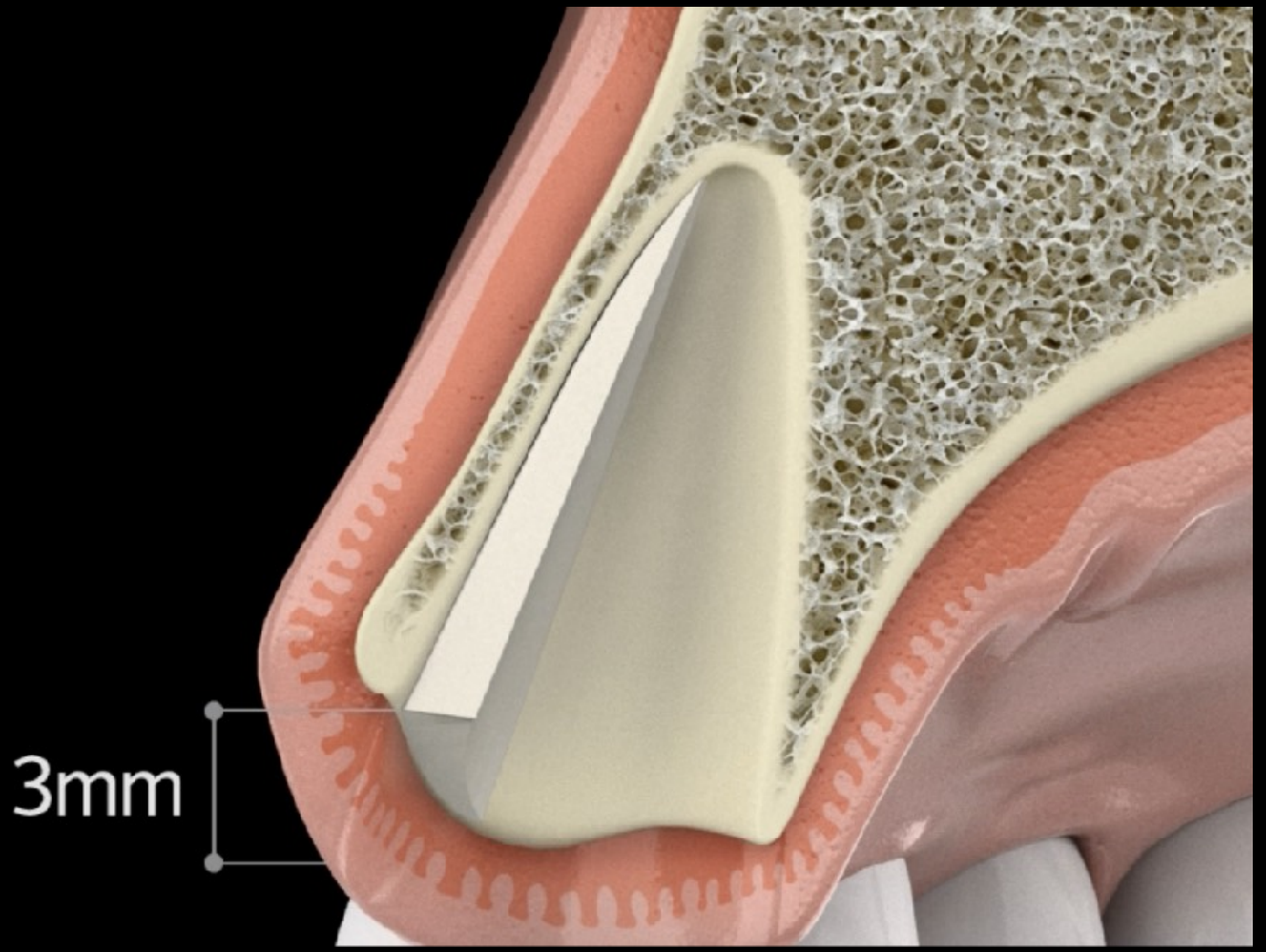
Recommended length Of root fragment

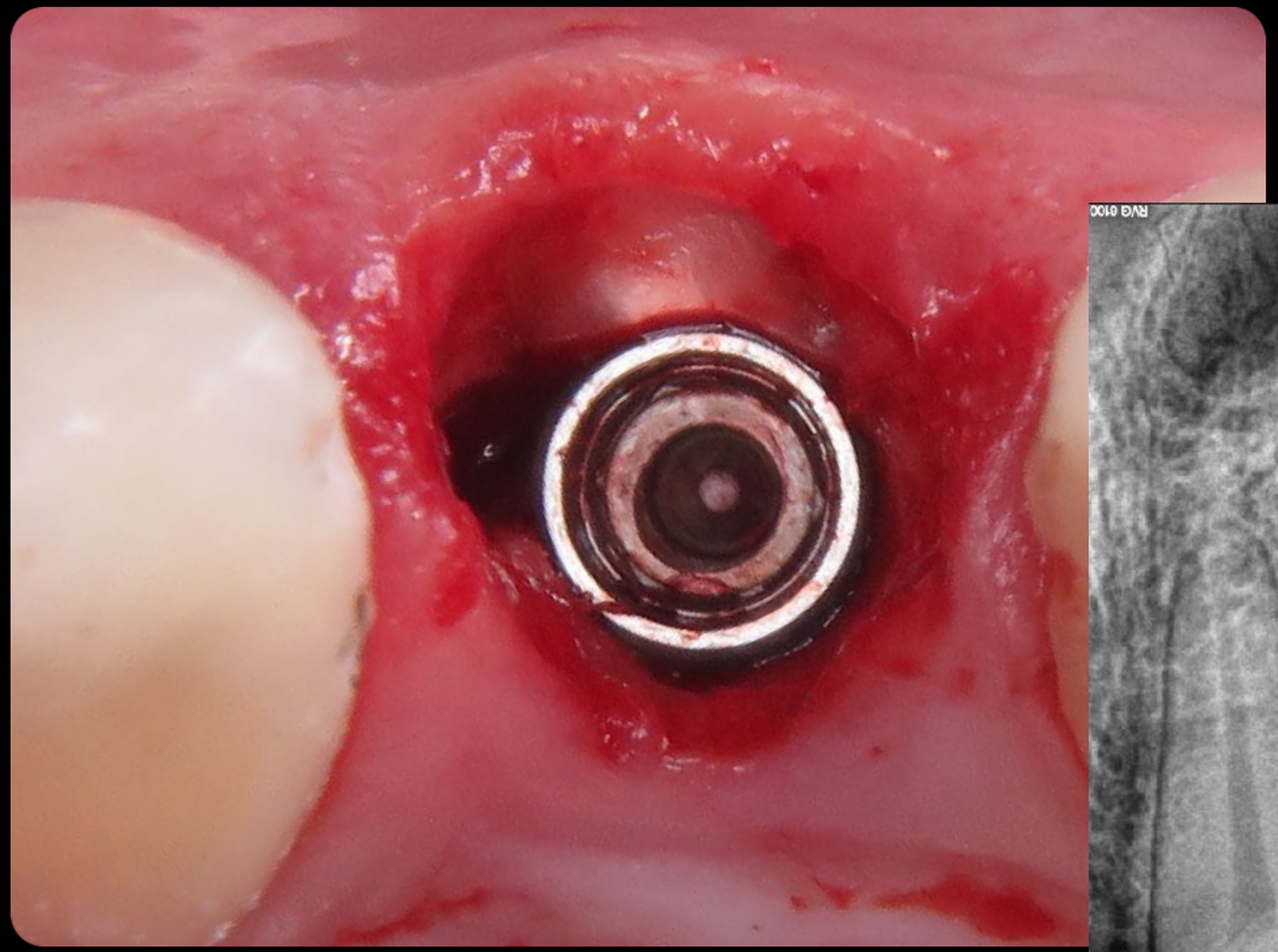


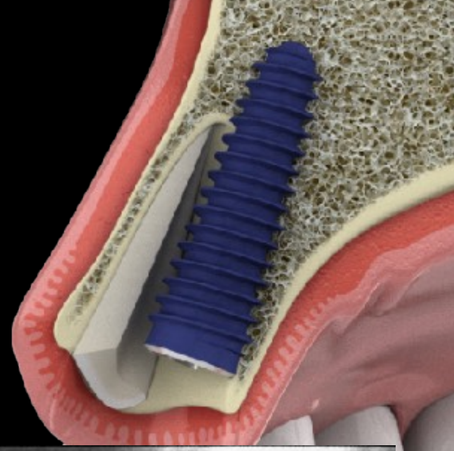


Recommended length Of root fragment

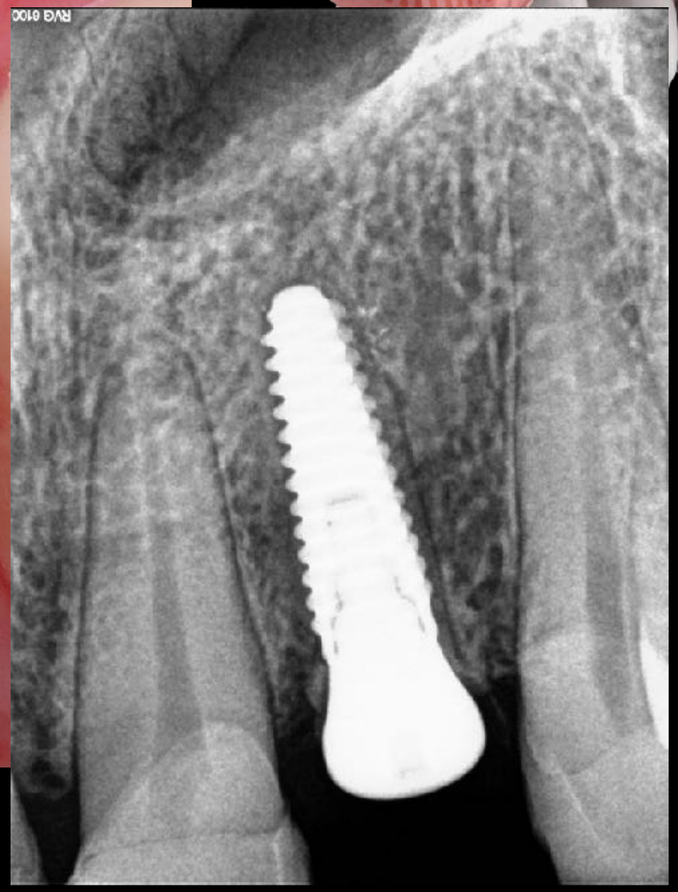




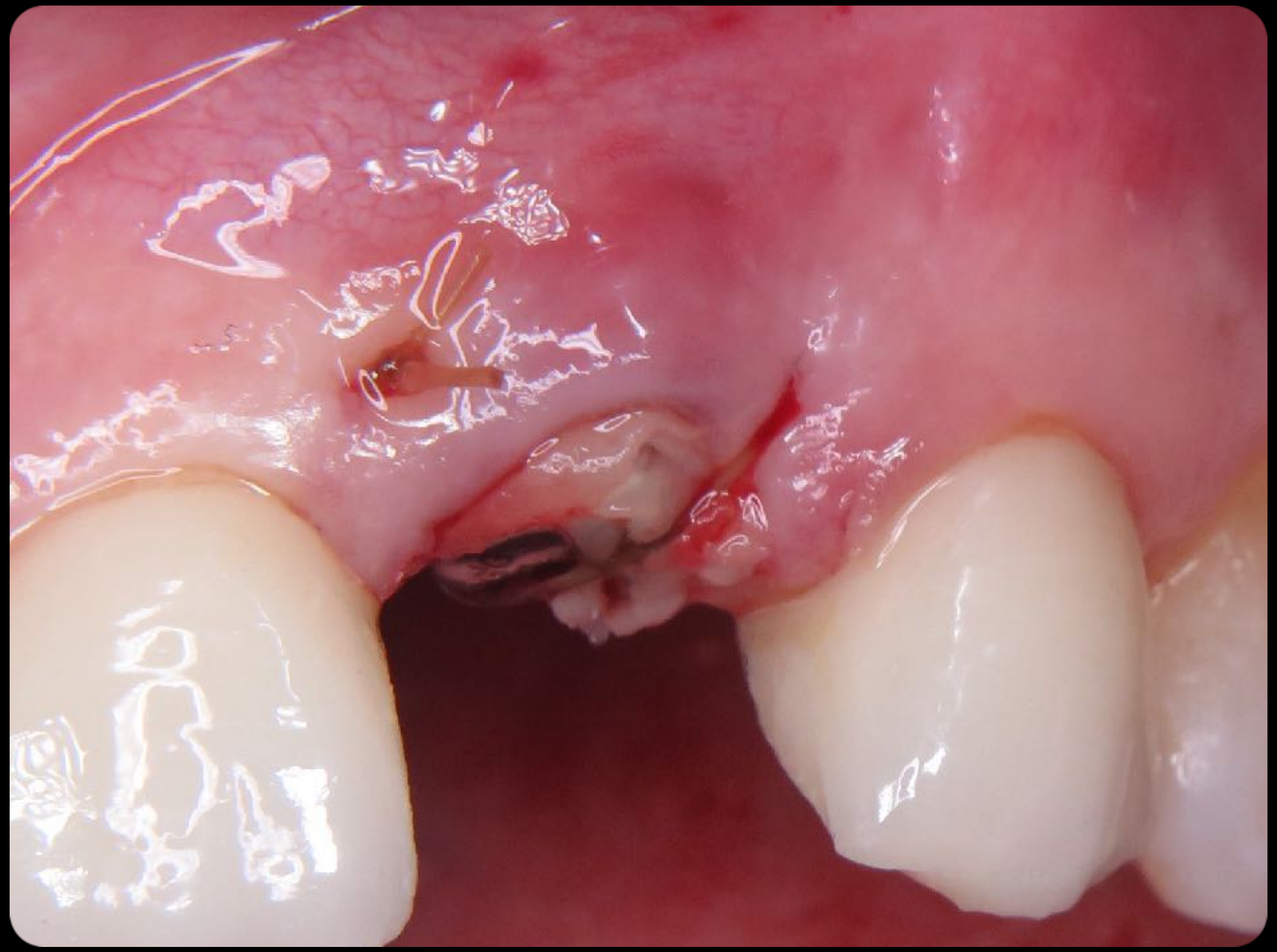




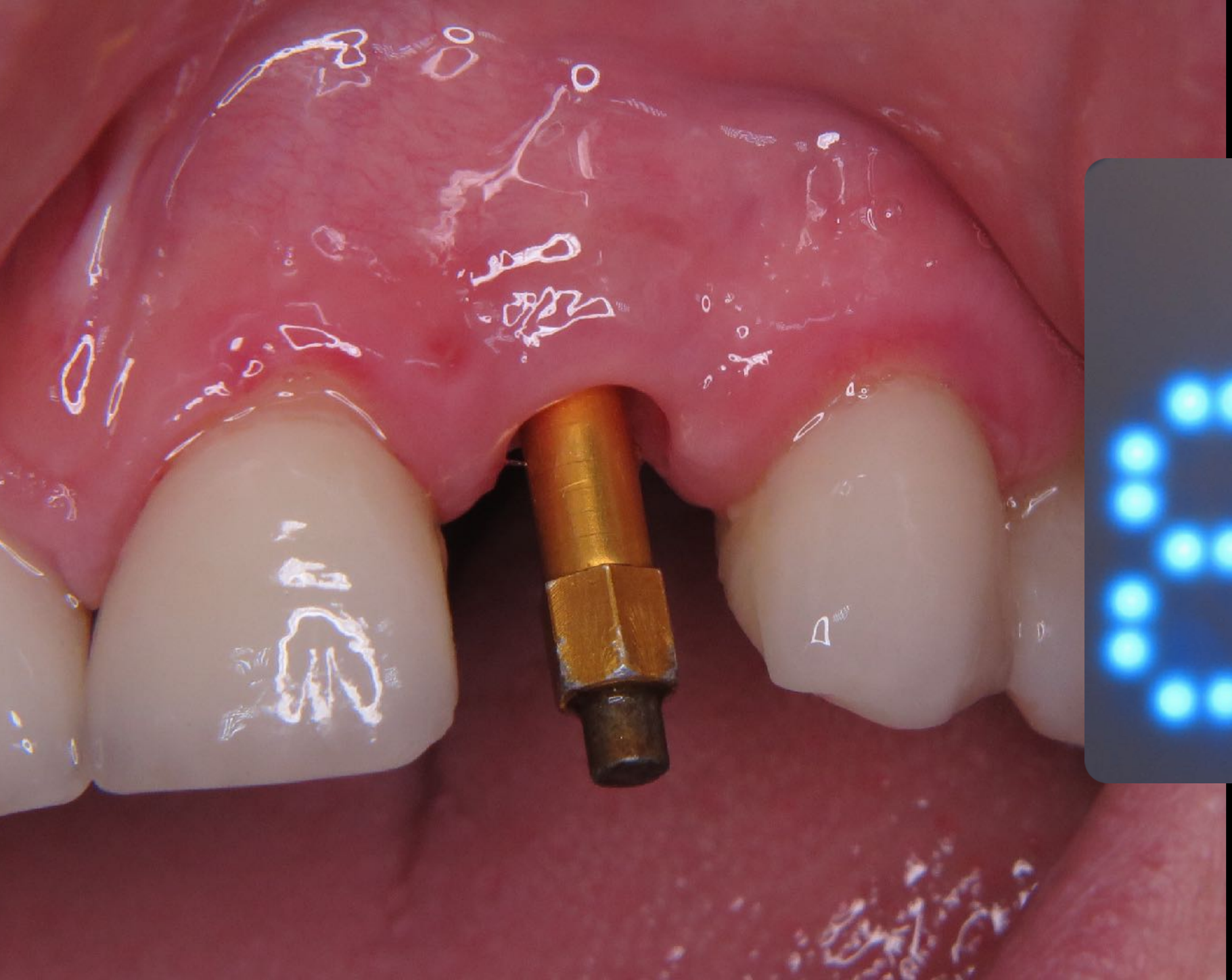

MEGA ISQ™
Original Osstell Technology
78



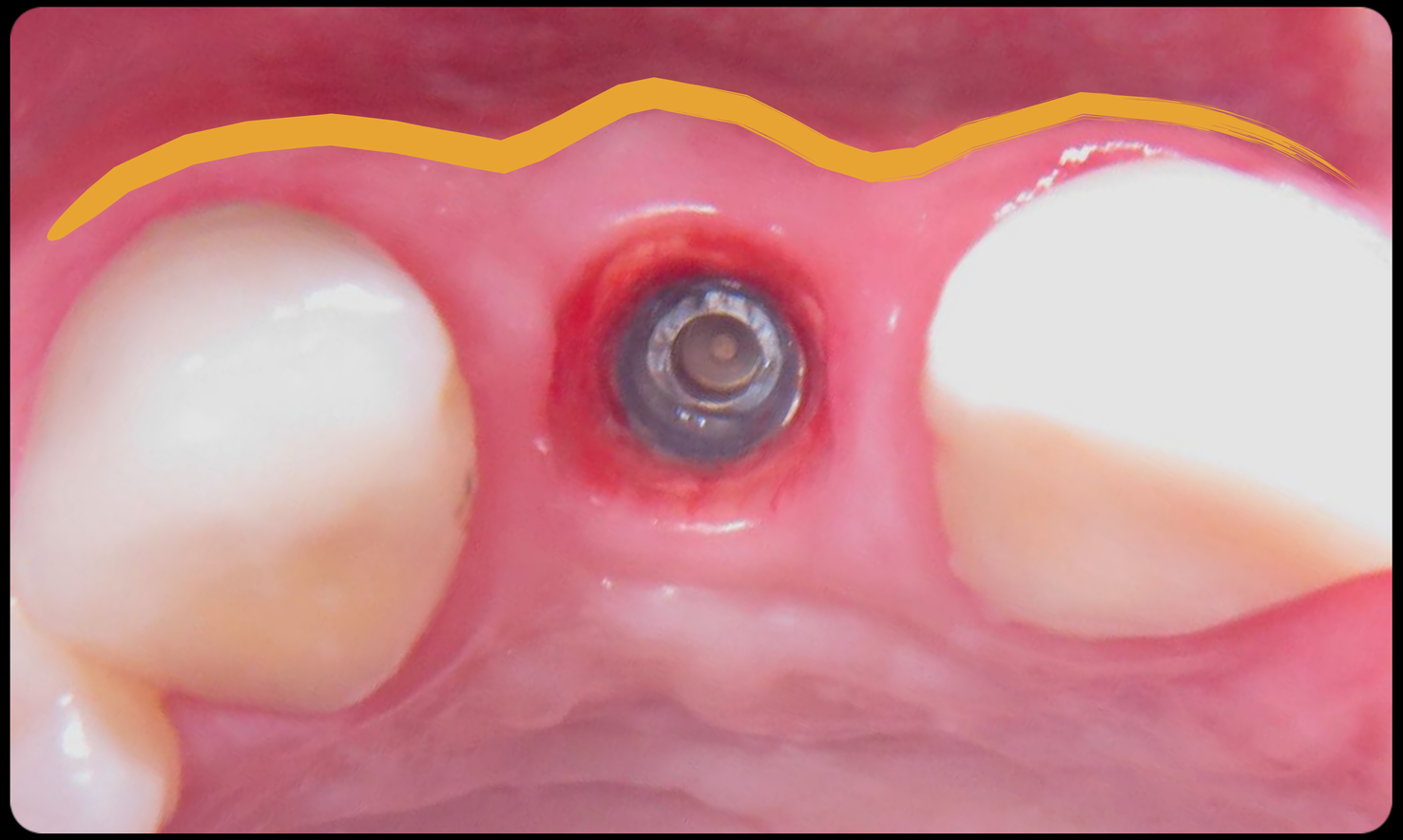
POST OP



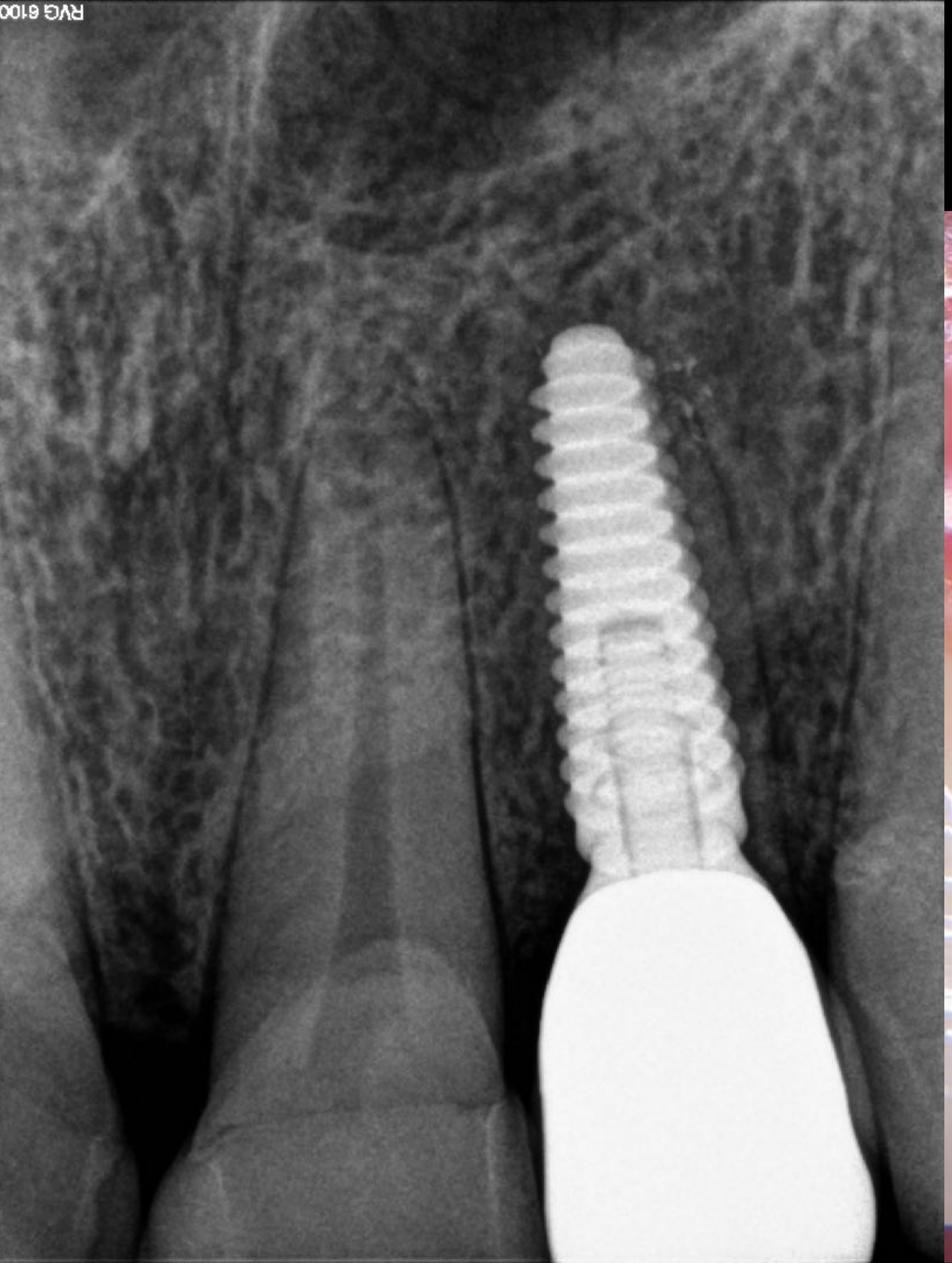
2 WK POST OP


MEGA ISQ™
Original Osstell Technology
80

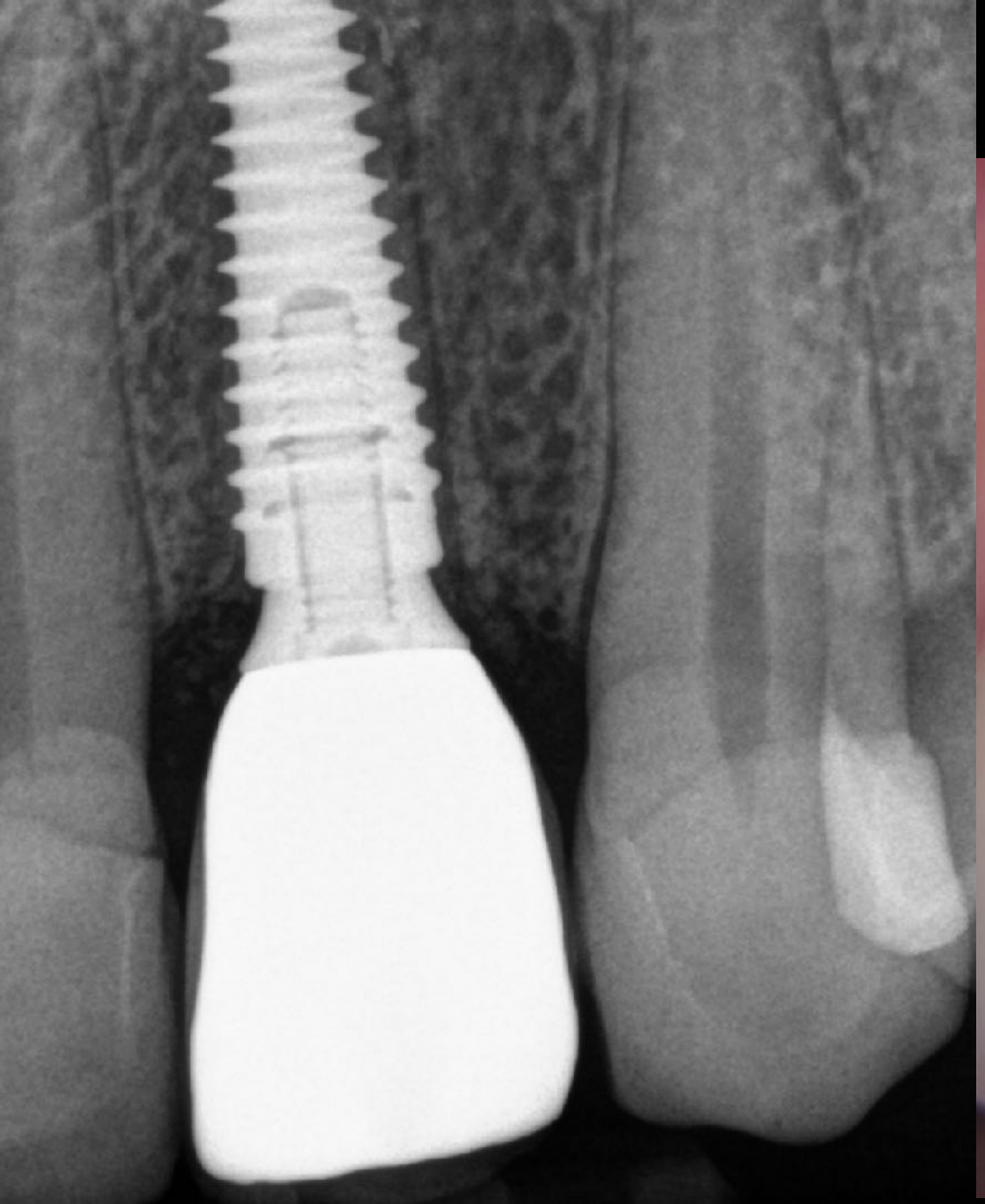
Screw Retained



Contour -
Emergence Profile

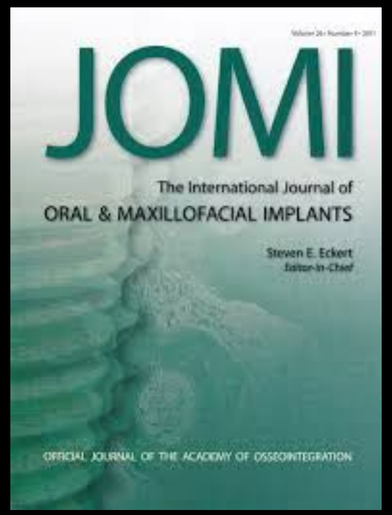


6 WK POST OP



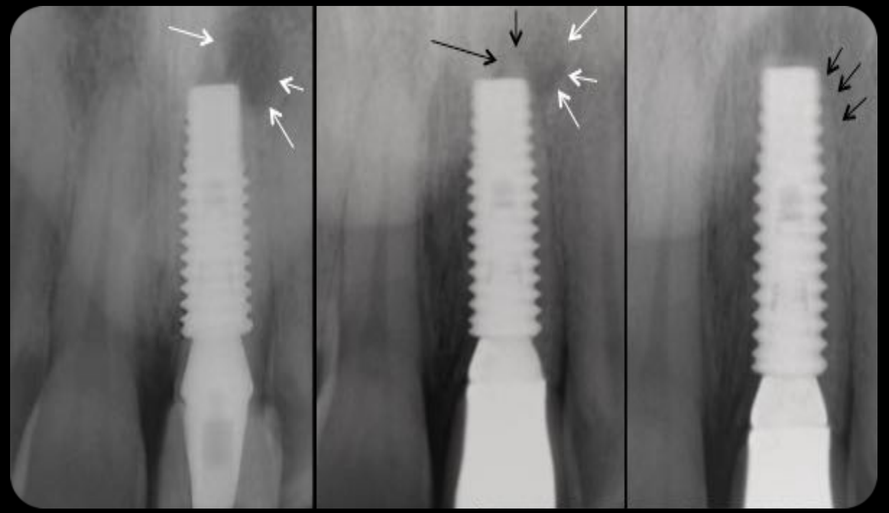
5 YR POST OP

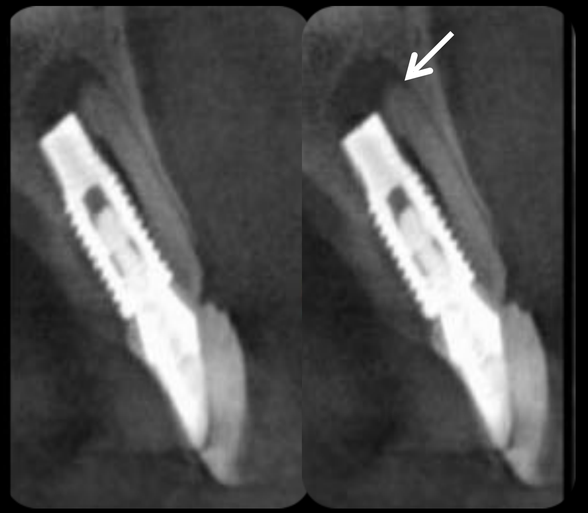
Root membrane in presence of periapical pathology

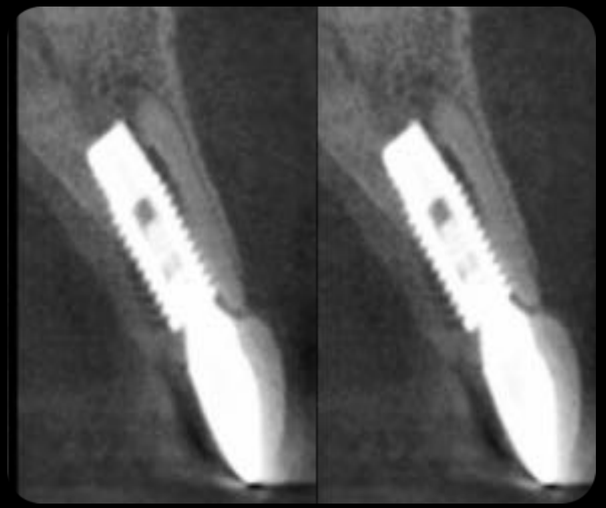


- One implant site per patient (n=46)
- Mean follow-up(±SD): 44.9±5.7 months
- All implants were immediately, non-functionally loaded and found to be clinically stable at subsequent evaluations
- Final loading was performed with fixed prostheses and all restorations functionally survived throughout the follow-ups
- Crestal bone loss was minimum:
  0.19±0.08 mm (Mesial) & 0.22±0.06 mm (Distal)

Siormpas KD, Mitsias ME, Kontsiotou-Siormpa E, Garber D, Kotsakis GA. Immediate implant placement in the esthetic zone utilizing the "root-membrane" technique: clinical results up to 5 years postloading. Int J Oral Maxillofac Implants. 2014 Nov-Dec;29(6):1397-405.



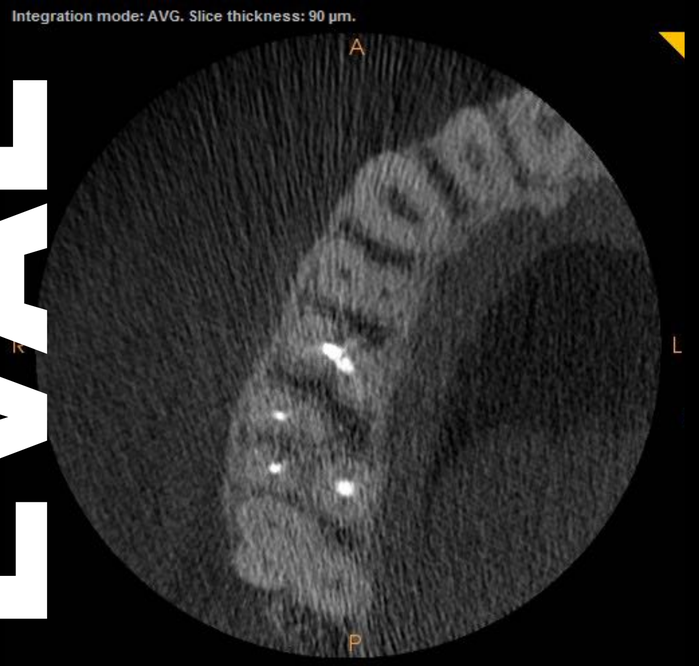




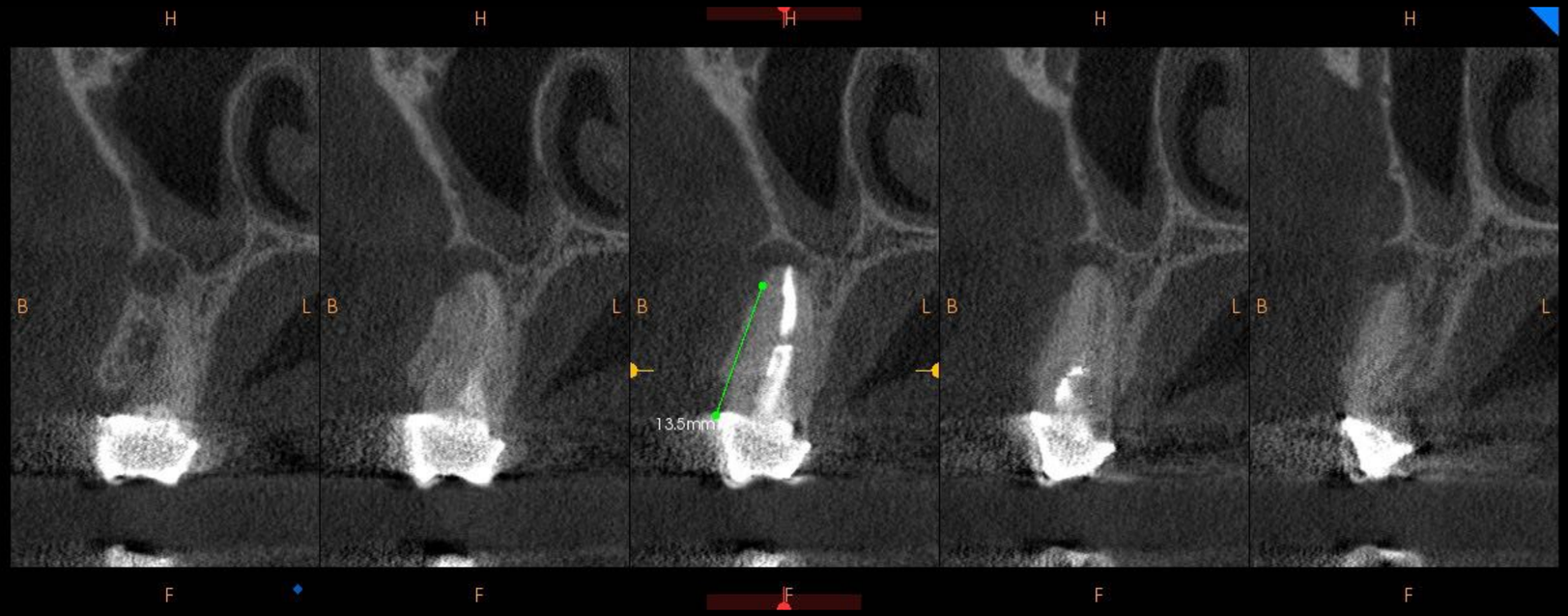
- Single incident of root resorption
- No subjective symptoms
- Uncompromised implant and restoration function
- Was considered ‘’failure’’ under strict success criteria

Siormpas KD, Mitsias ME, Kontsiotou-Siormpa E, Garber D, Kotsakis GA. Immediate implant placement in the esthetic zone utilizing the "root-membrane" technique: clinical results up to 5 years postloading. Int J Oral Maxillofac Implants. 2014 Nov-Dec;29(6):1397-405.

CBCT EVAL


Integration mode: AVG. Slice thickness: 90 µm.
A
R
L
P


H
F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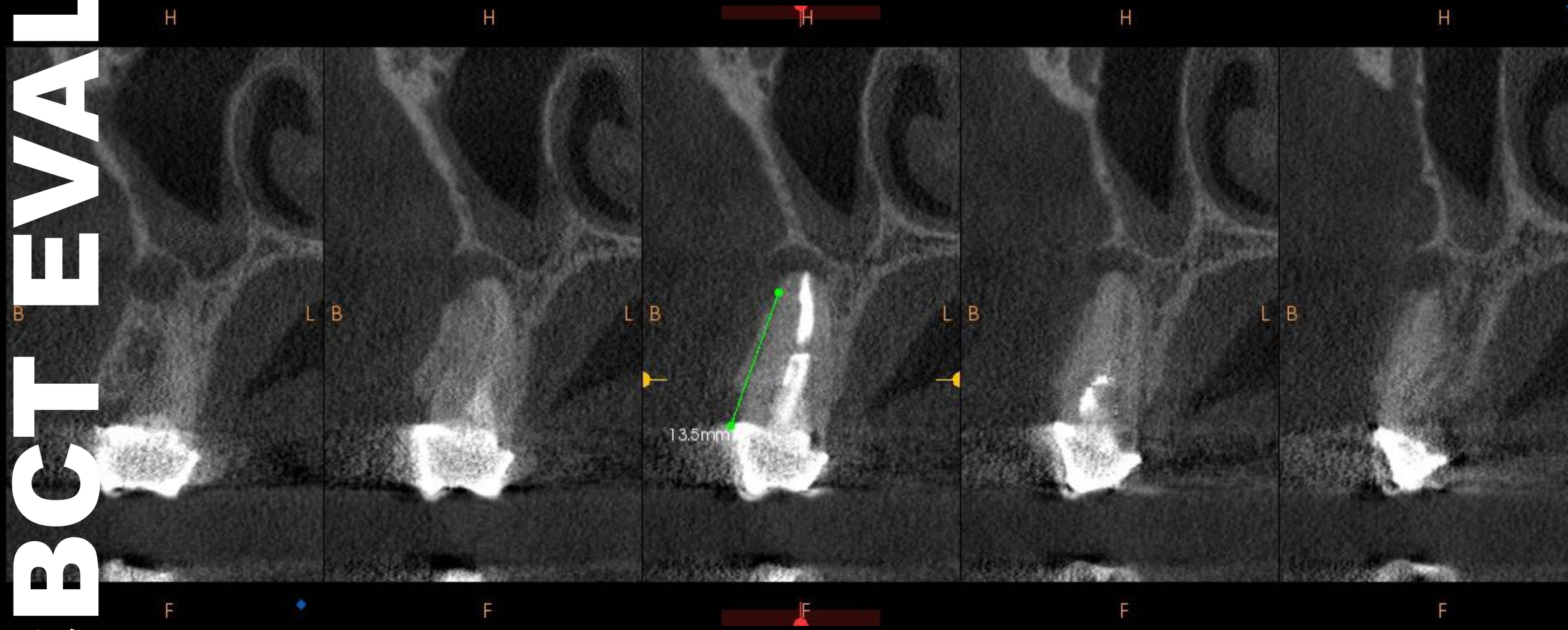
CBCT EVAL



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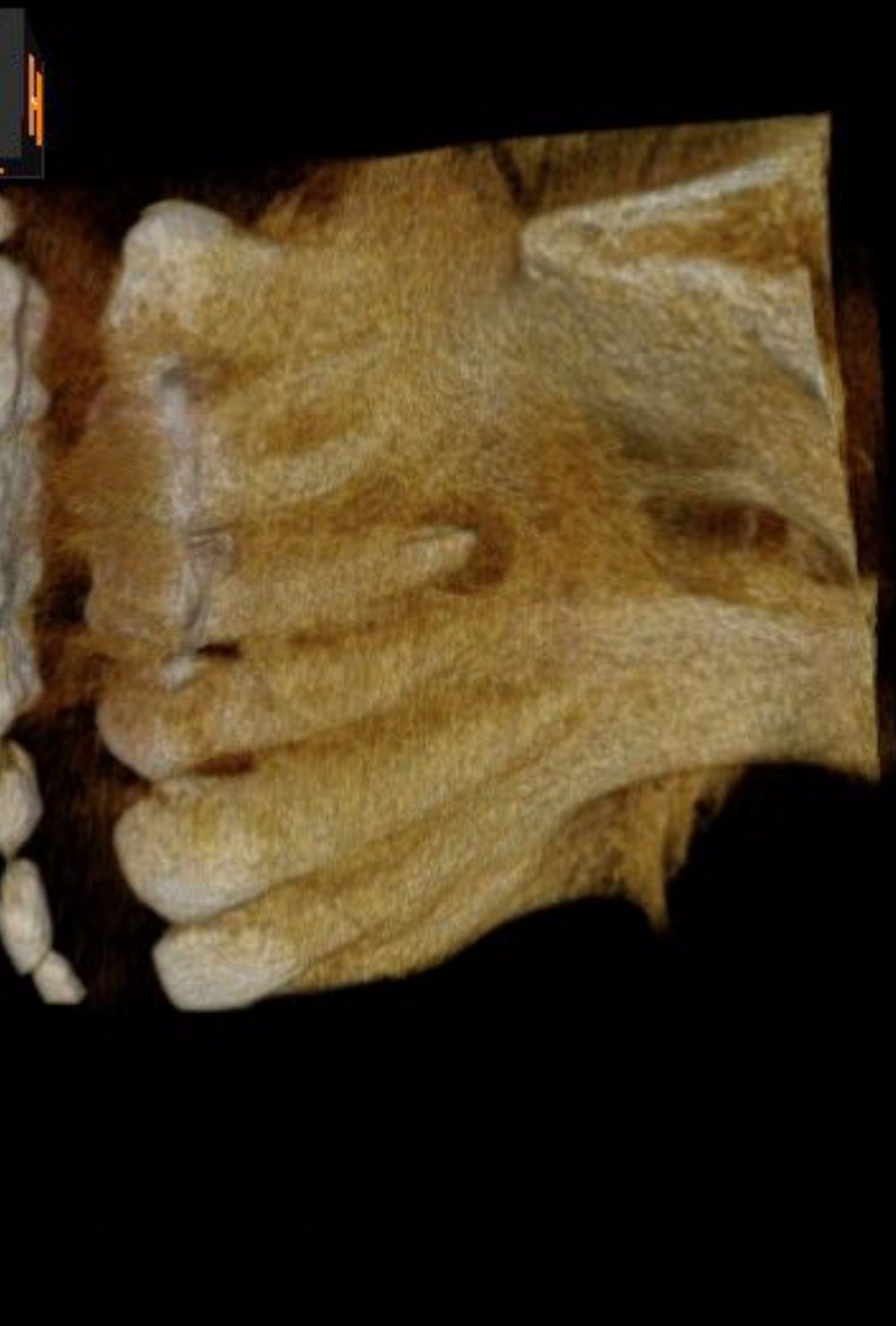

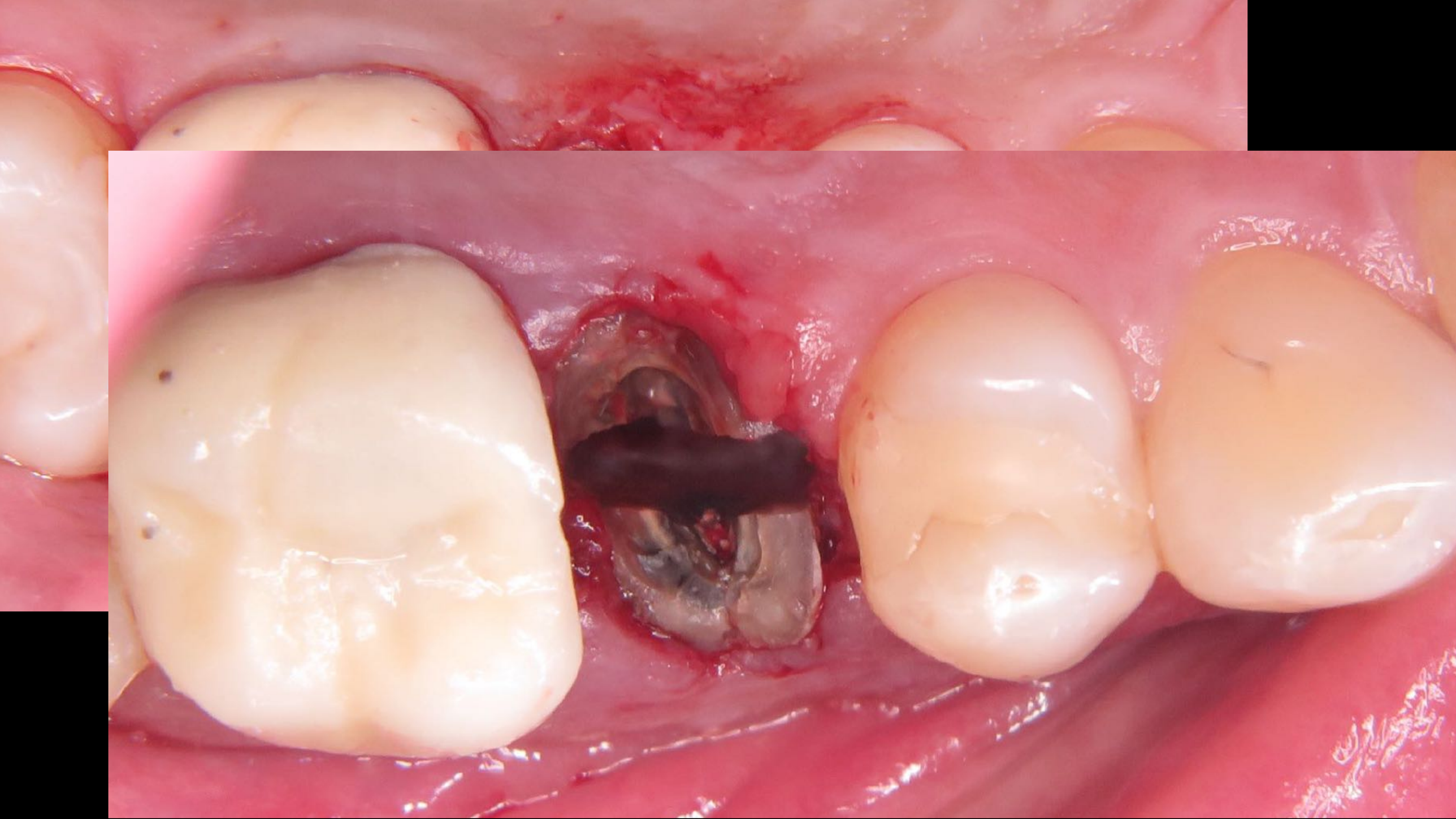

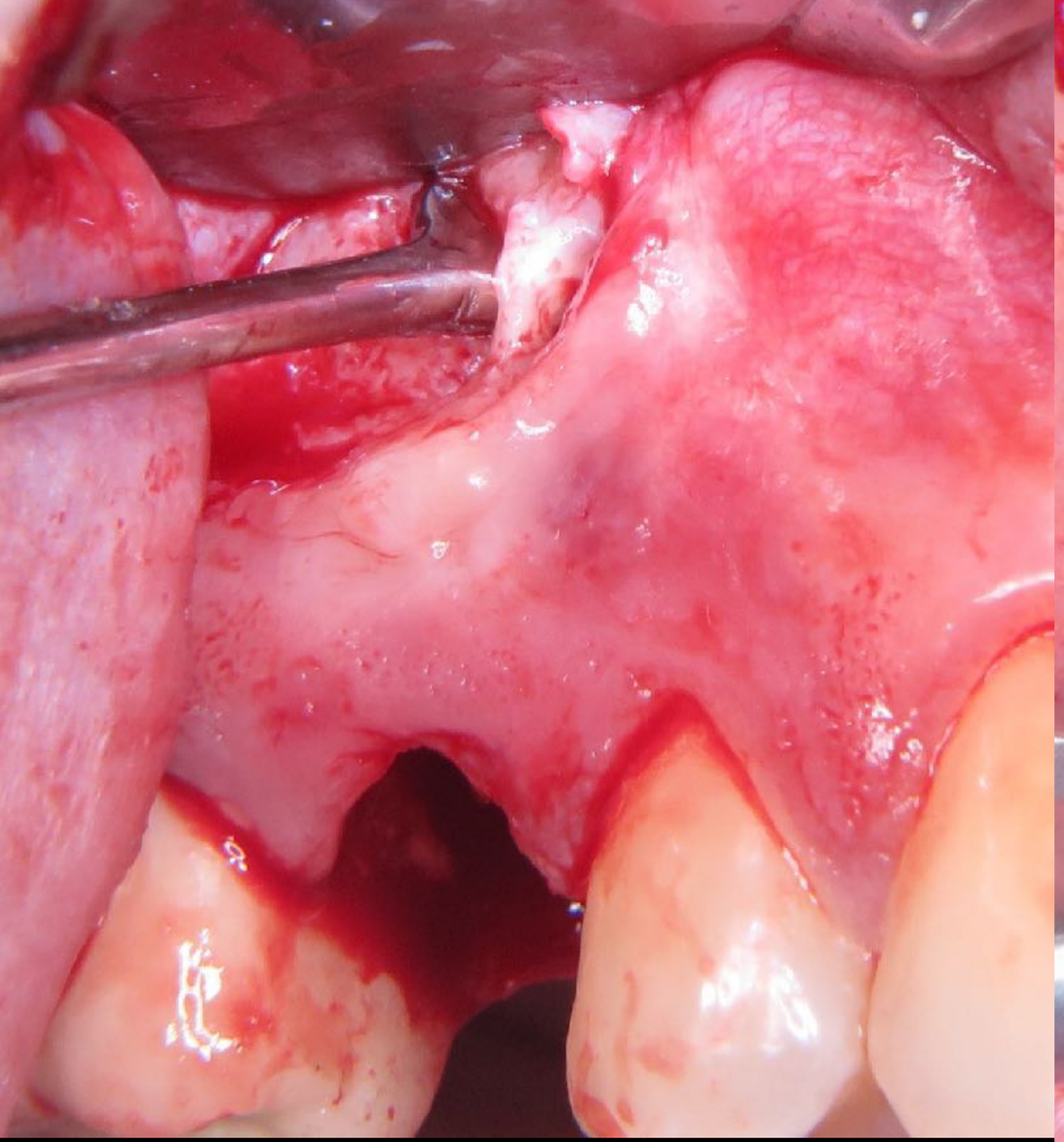

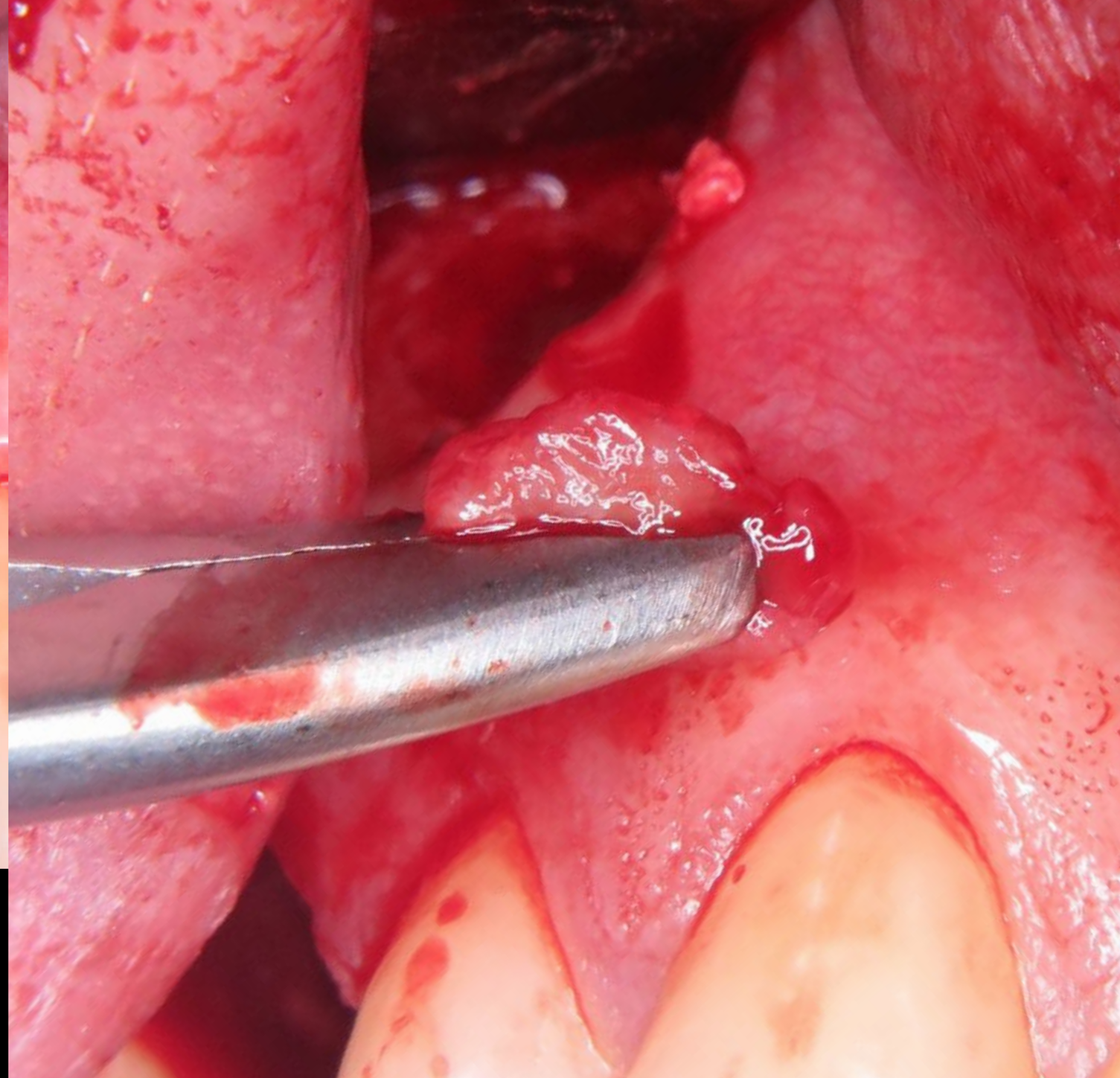

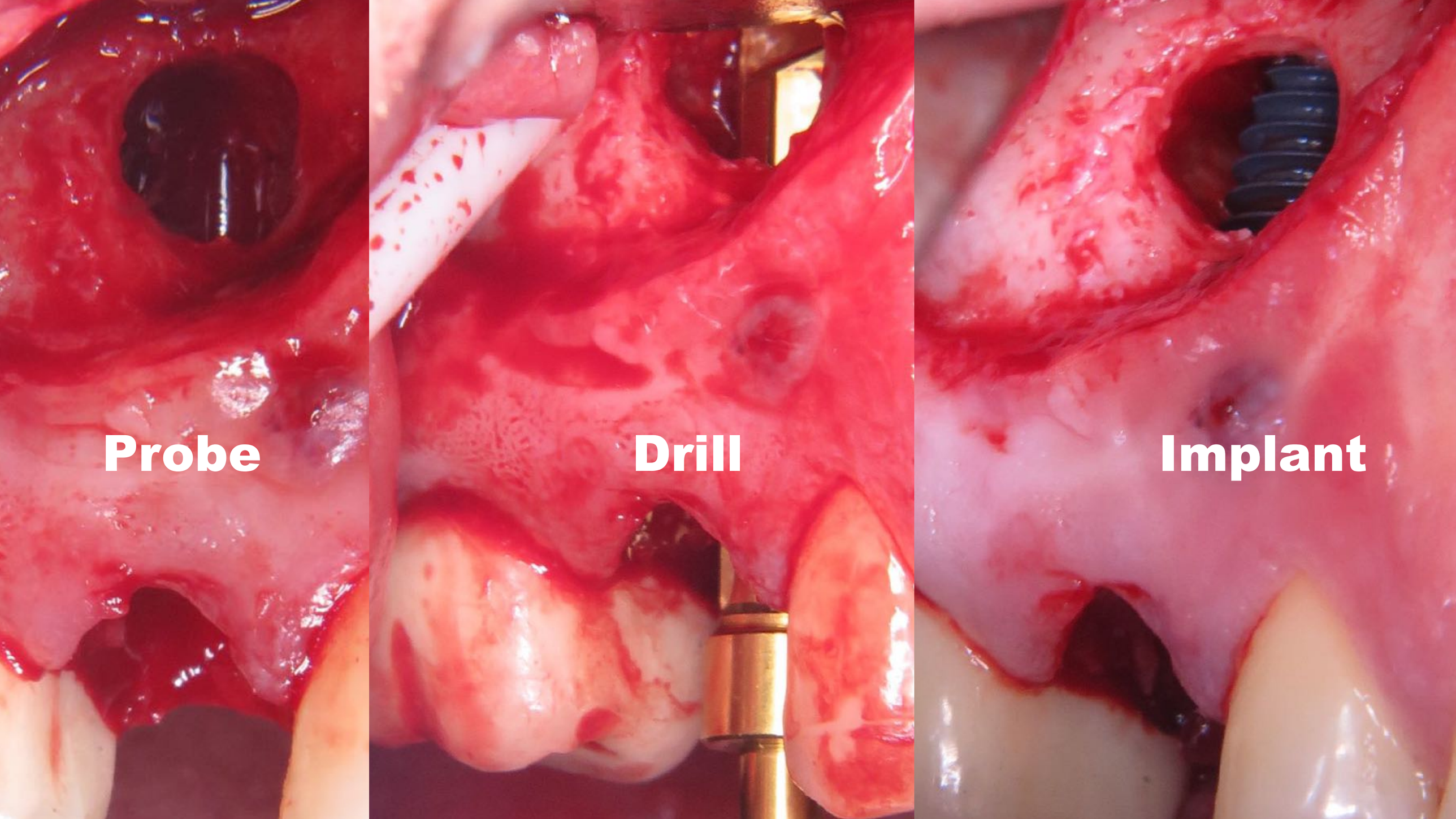
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Drill
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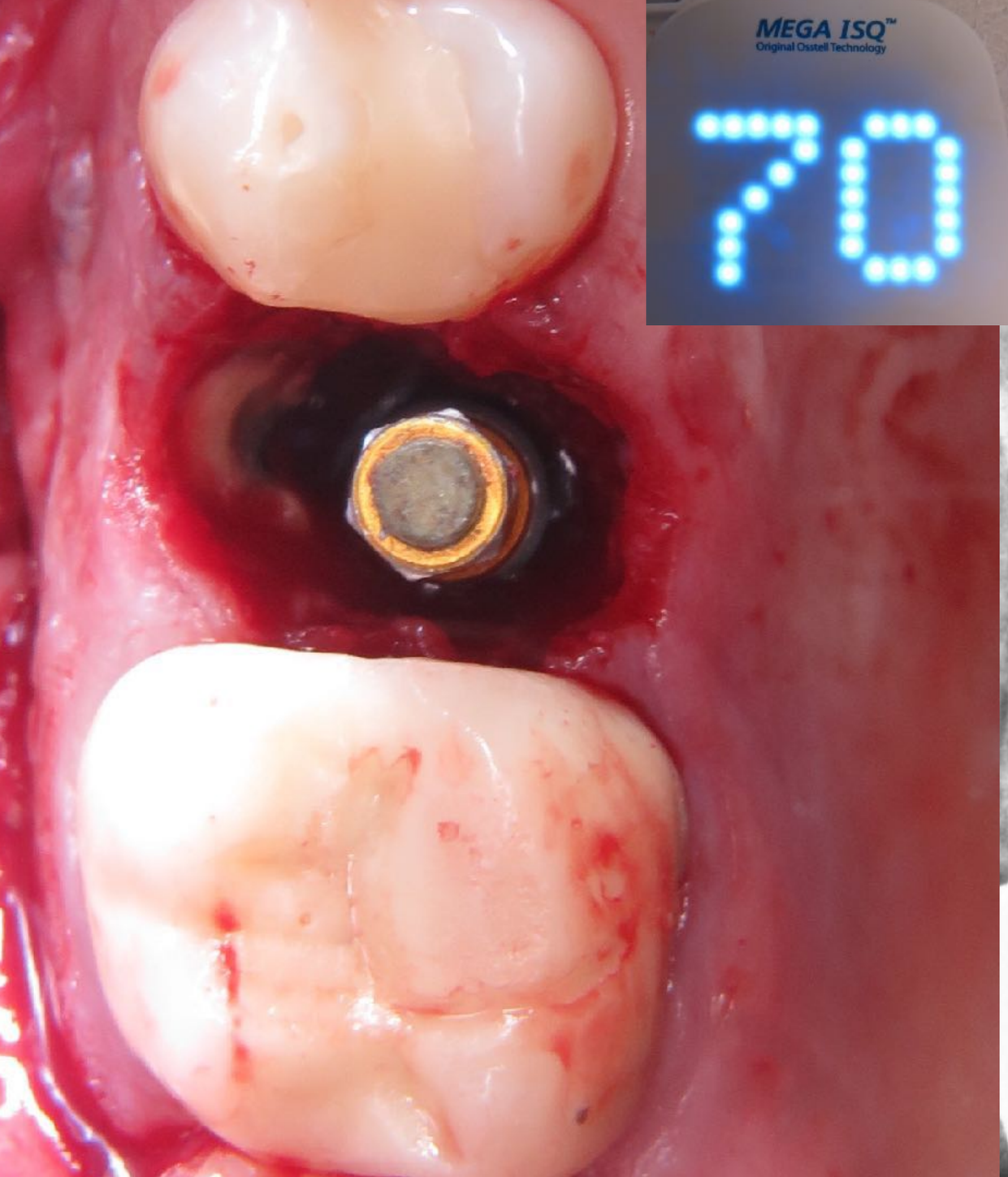
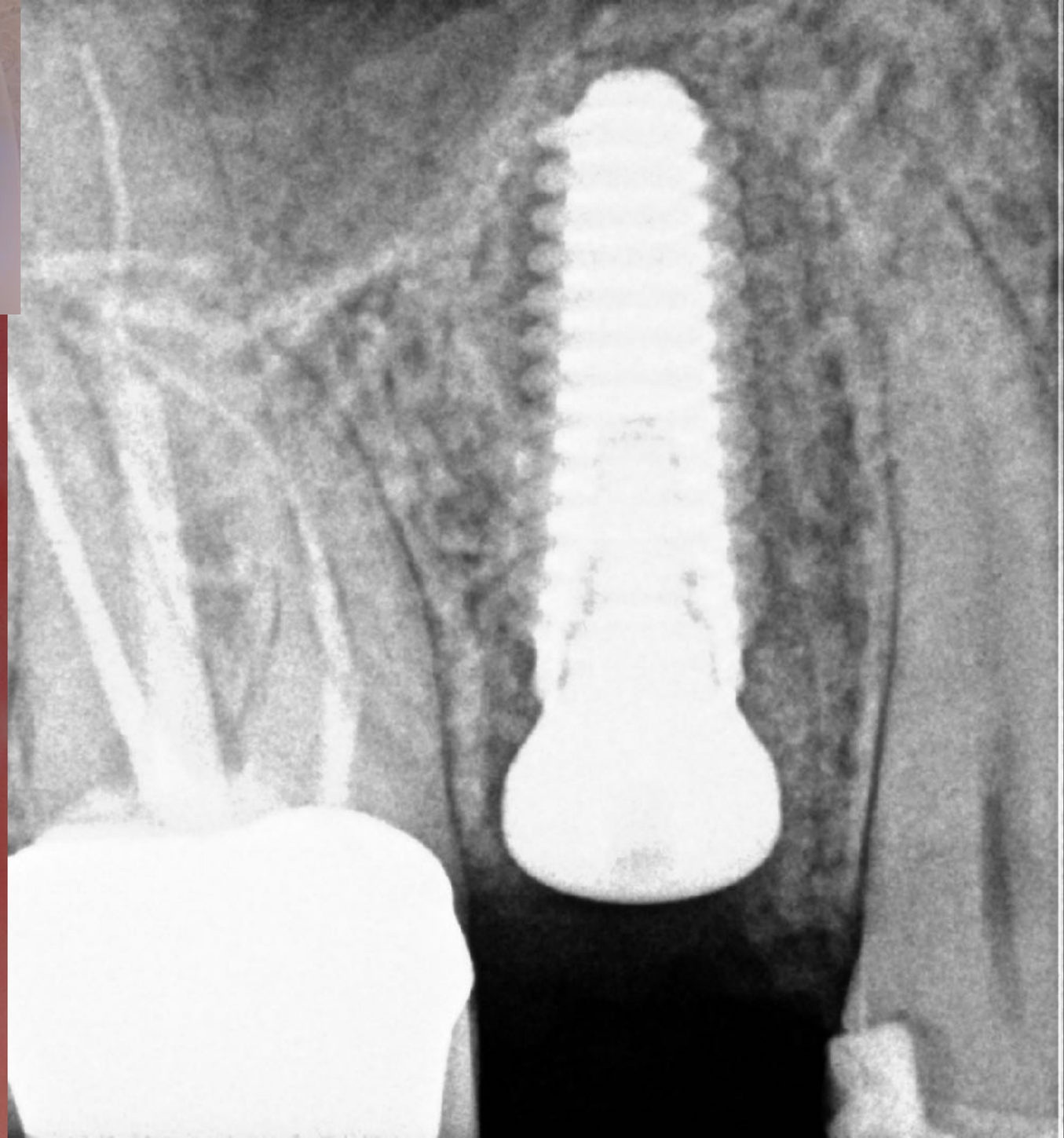
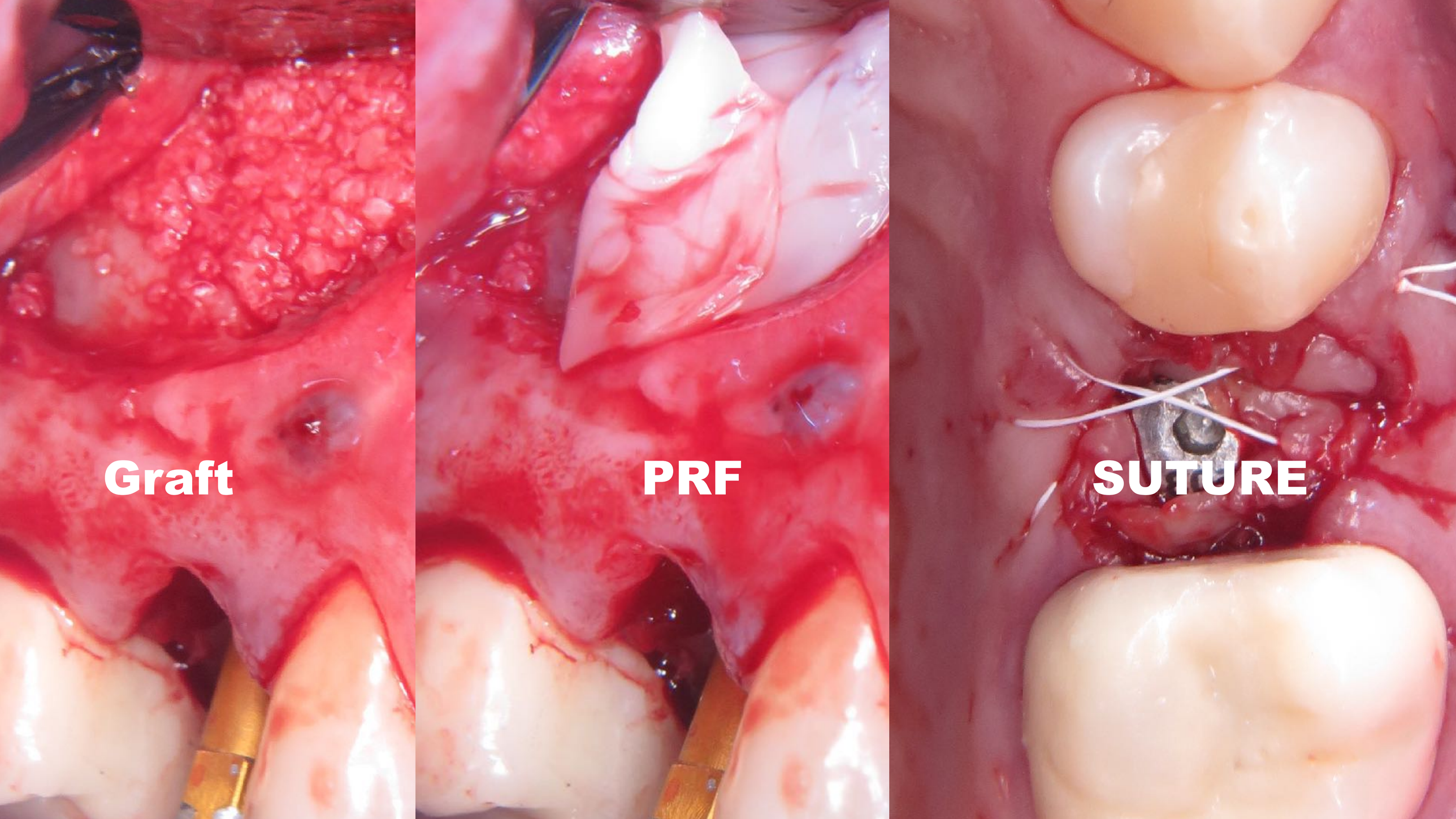

MEGA ISQ™
Original Osstell Technology
70

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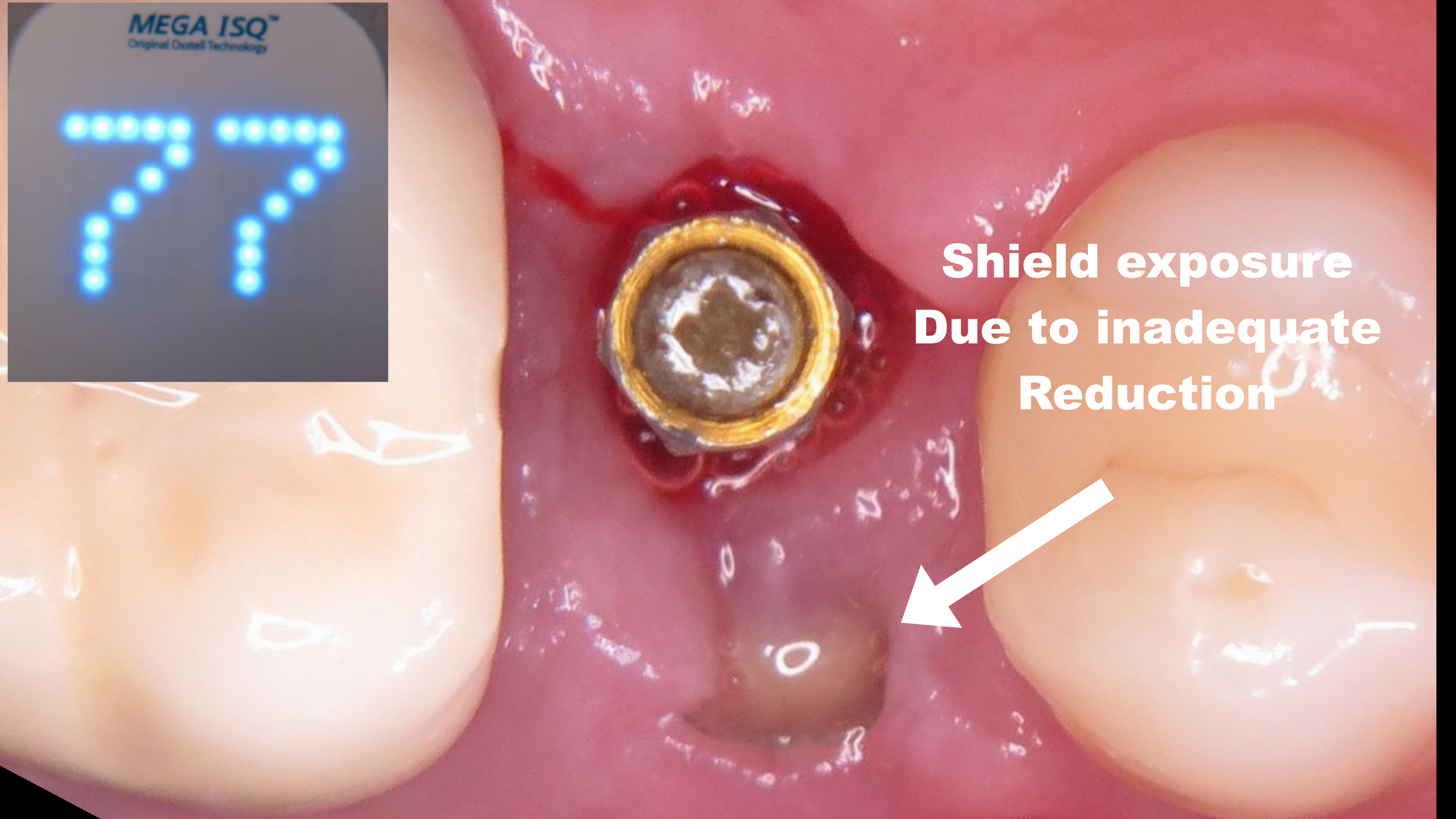
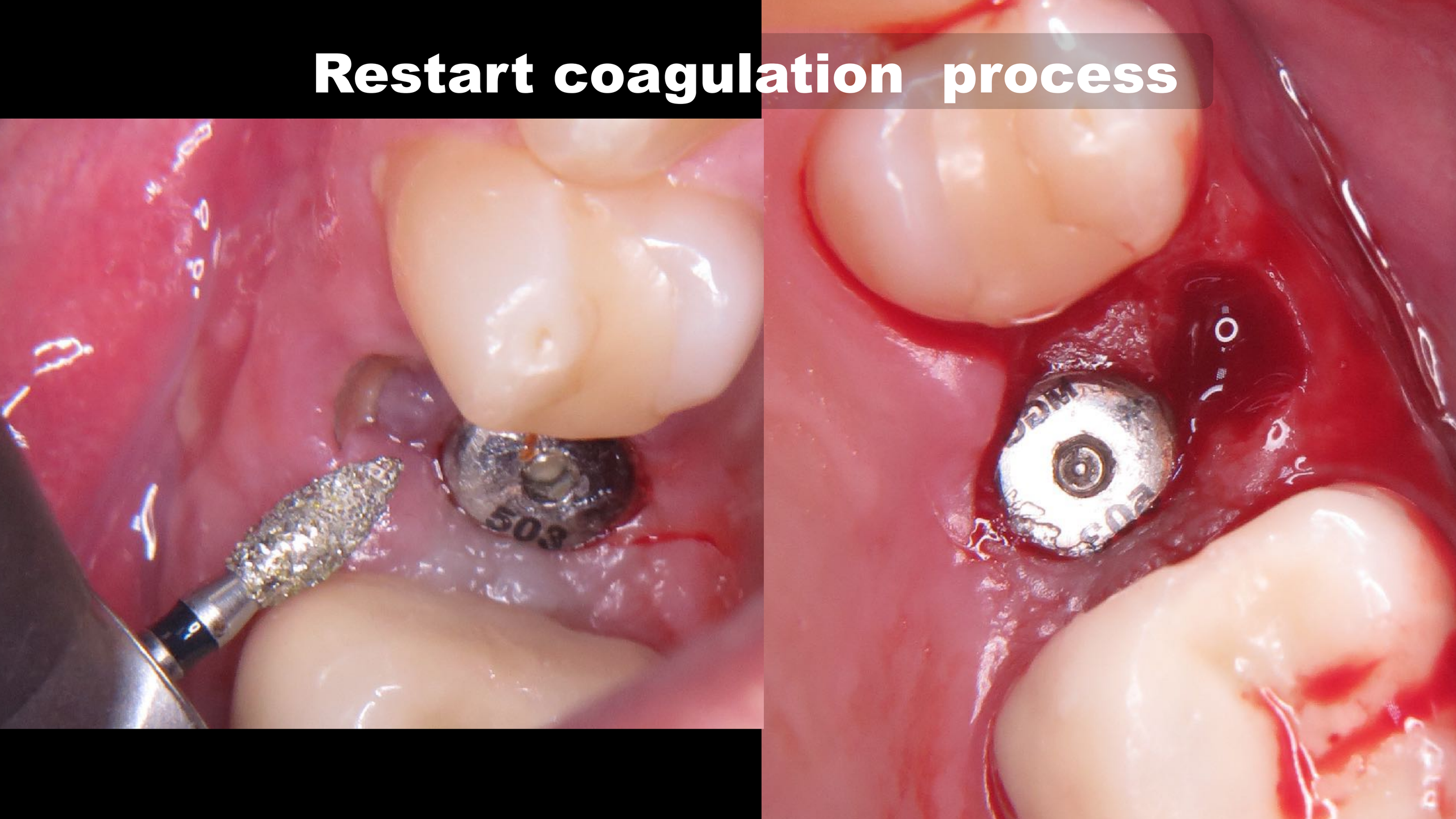

MEGA ISQ
Original Osstell Technology
77
Shield exposure
Due to inadequate
Reduction

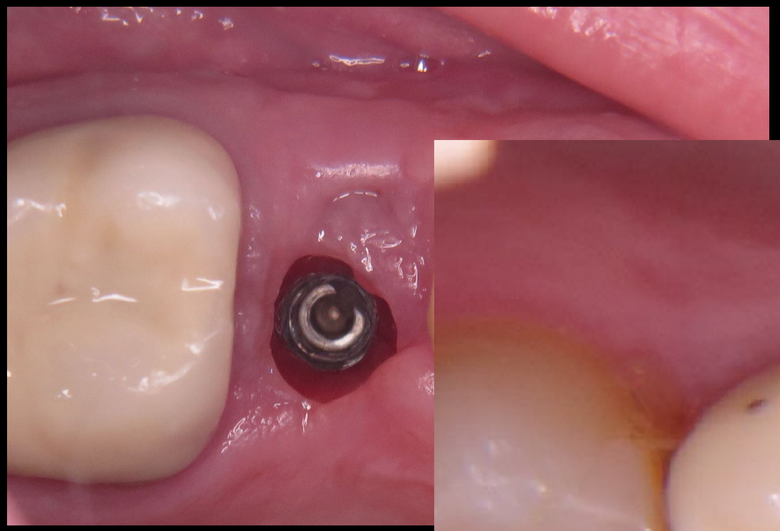
Restart coagulation process

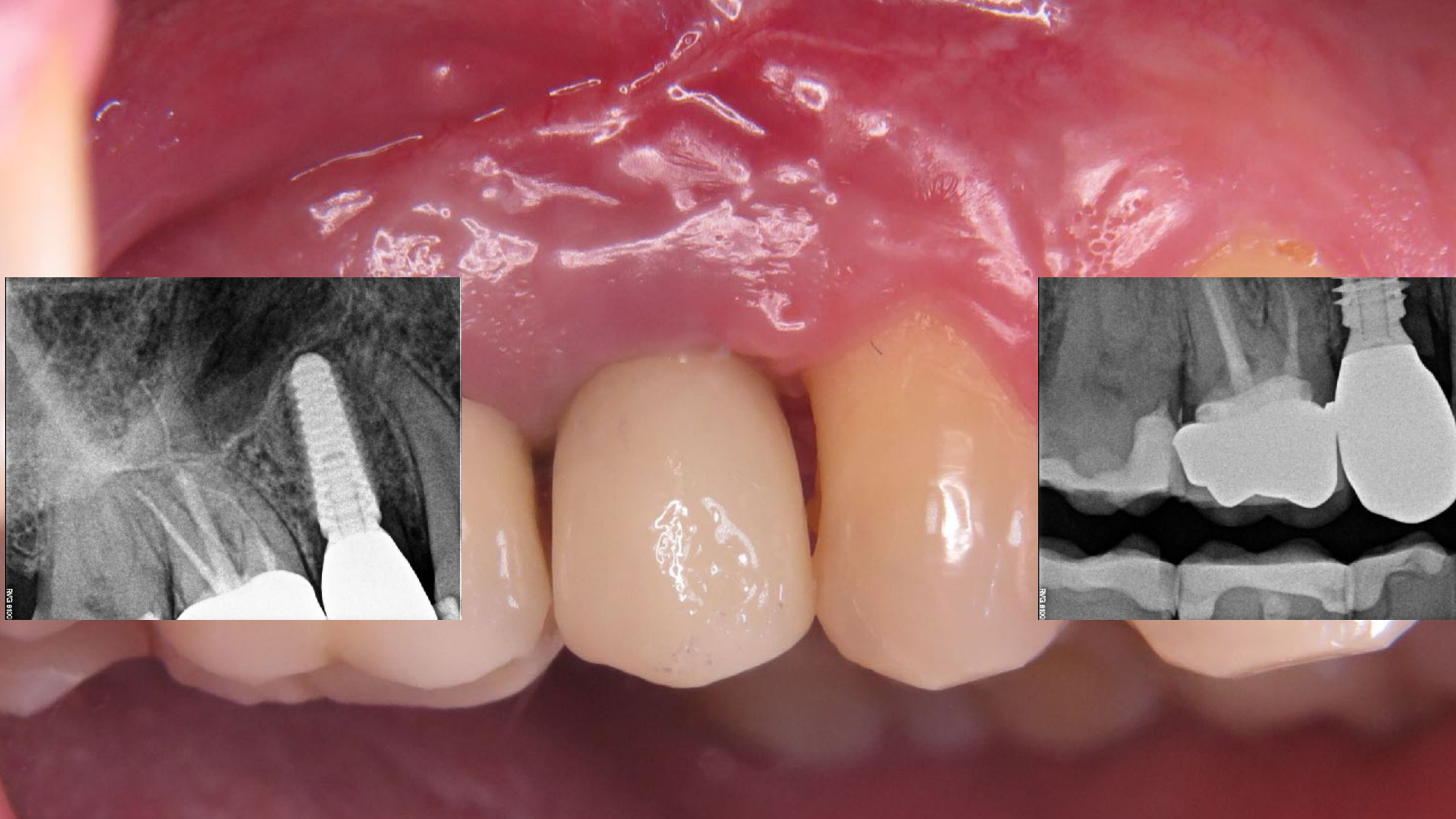



Healing 2 weeks


Open tray impression


Healing 4 weeks





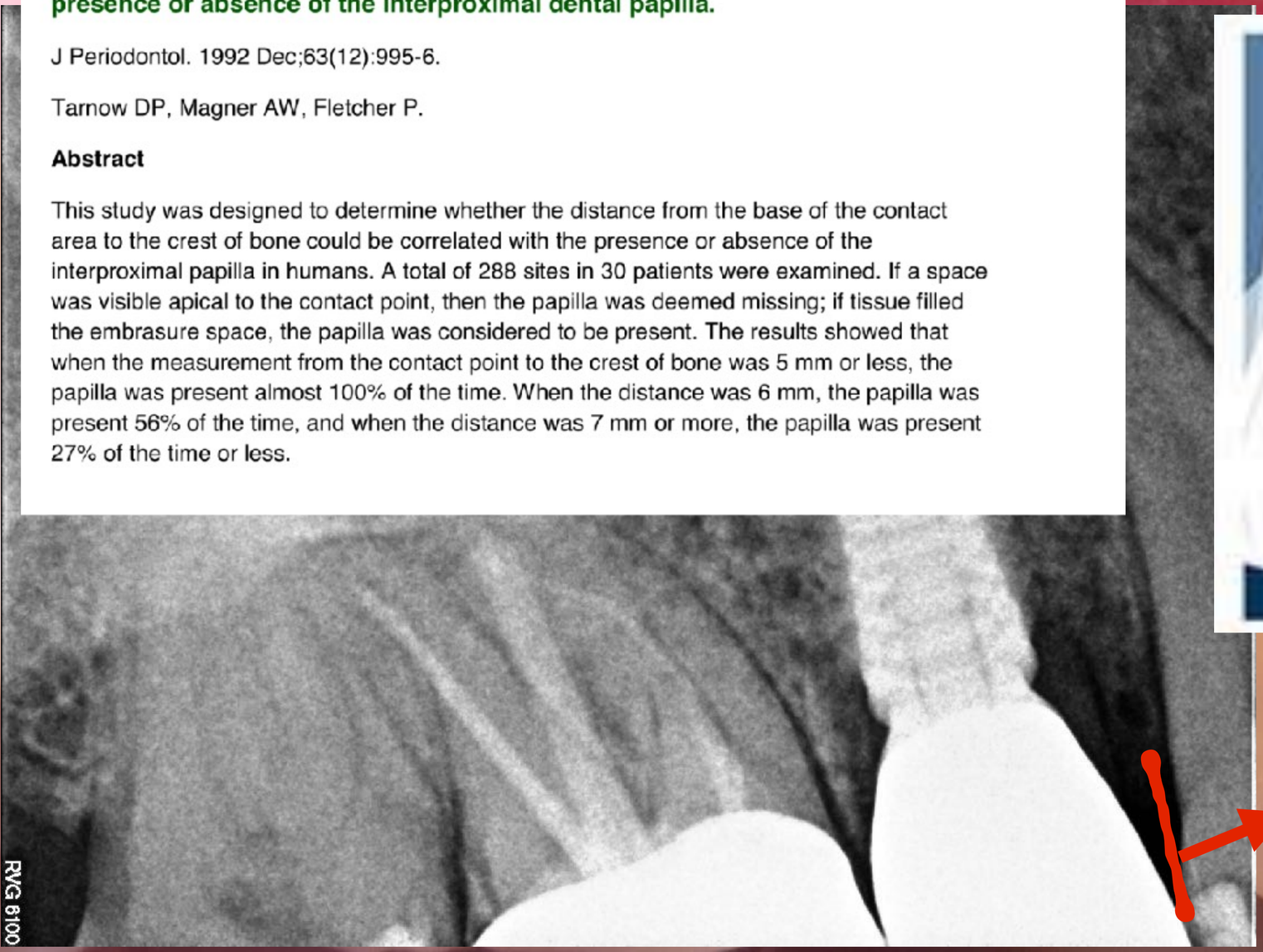
The effect of the distance from the contact point to the crest of bone on the presence or absence of the interproximal dental papilla.

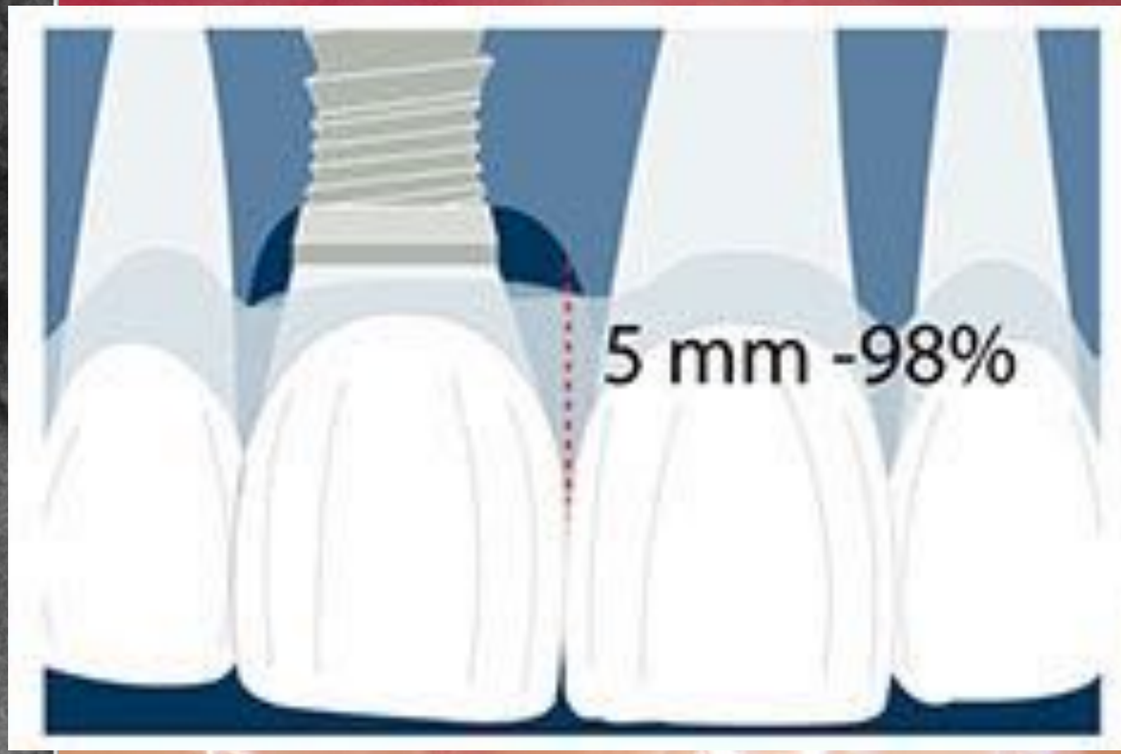
J Periodontol. 1992 Dec;63(12):995-6.

Tarnow DP, Magner AW, Fletcher P.

Abstract

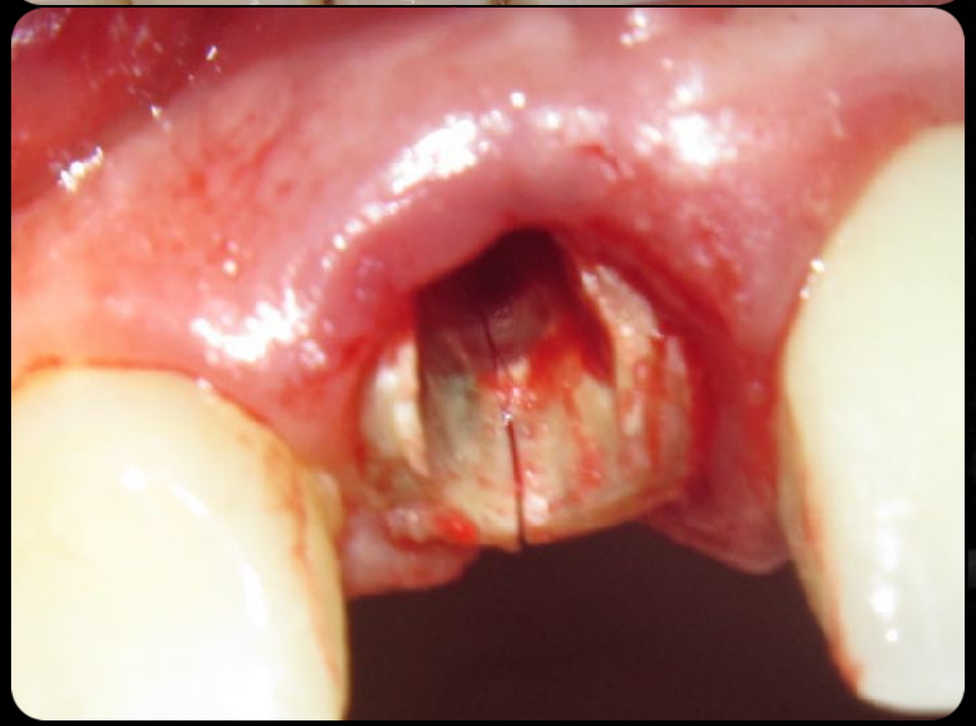
This study was designed to determine whether the distance from the base of the contact area to the crest of bone could be correlated with the presence or absence of the interproximal papilla in humans. A total of 288 sites in 30 patients were examined. If a space was visible apical to the contact point, then the papilla was deemed missing; if tissue filled the embrasure space, the papilla was considered to be present. The results showed that when the measurement from the contact point to the crest of bone was 5 mm or less, the papilla was present almost 100% of the time. When the distance was 6 mm, the papilla was present 56% of the time, and when the distance was 7 mm or more, the papilla was present 27% of the time or less.



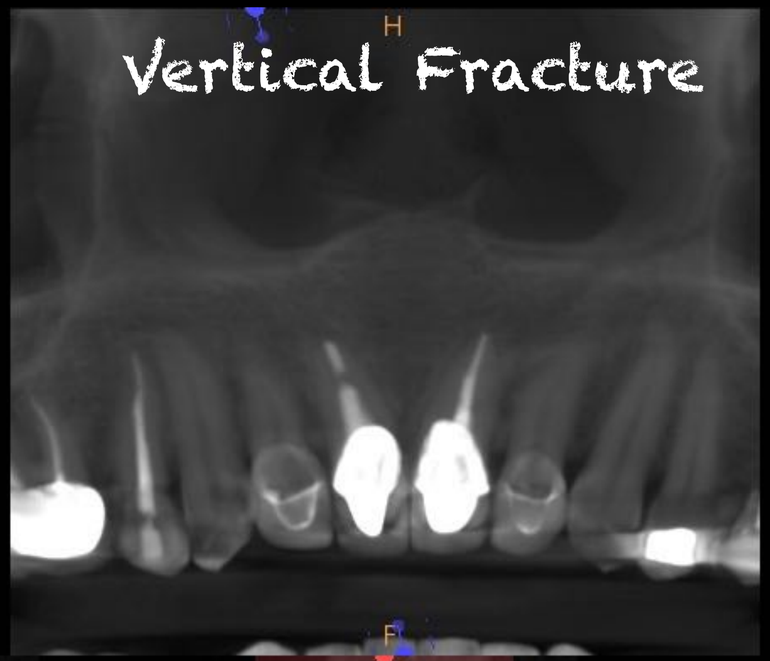



1 Year post op

GBR/CTG VS Socket shield



Vertical Fracture



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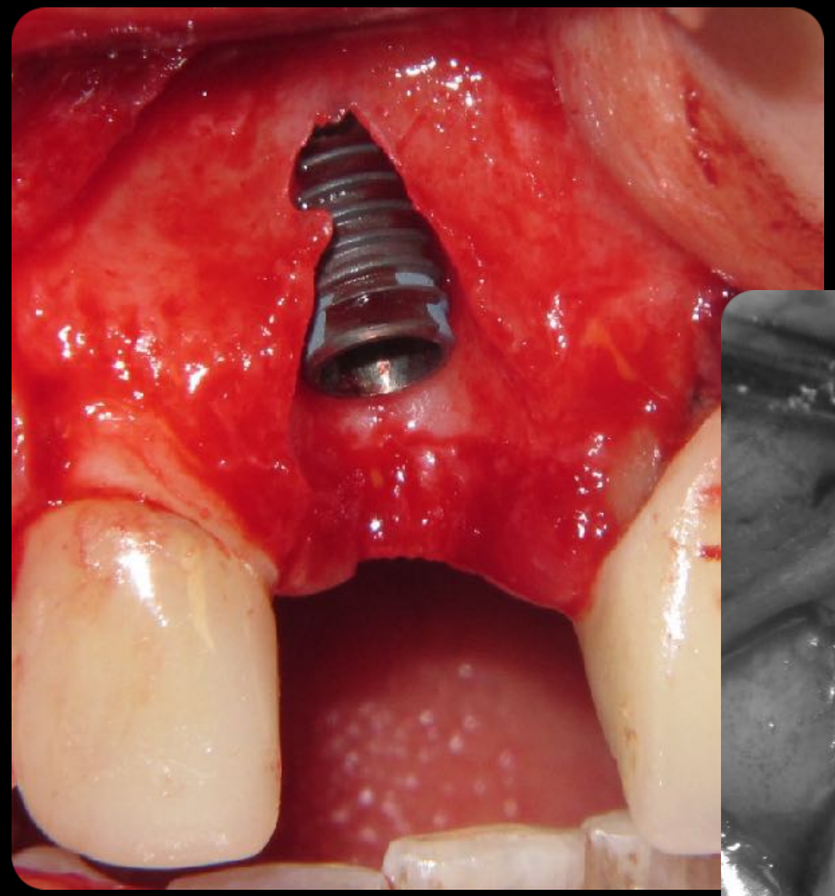

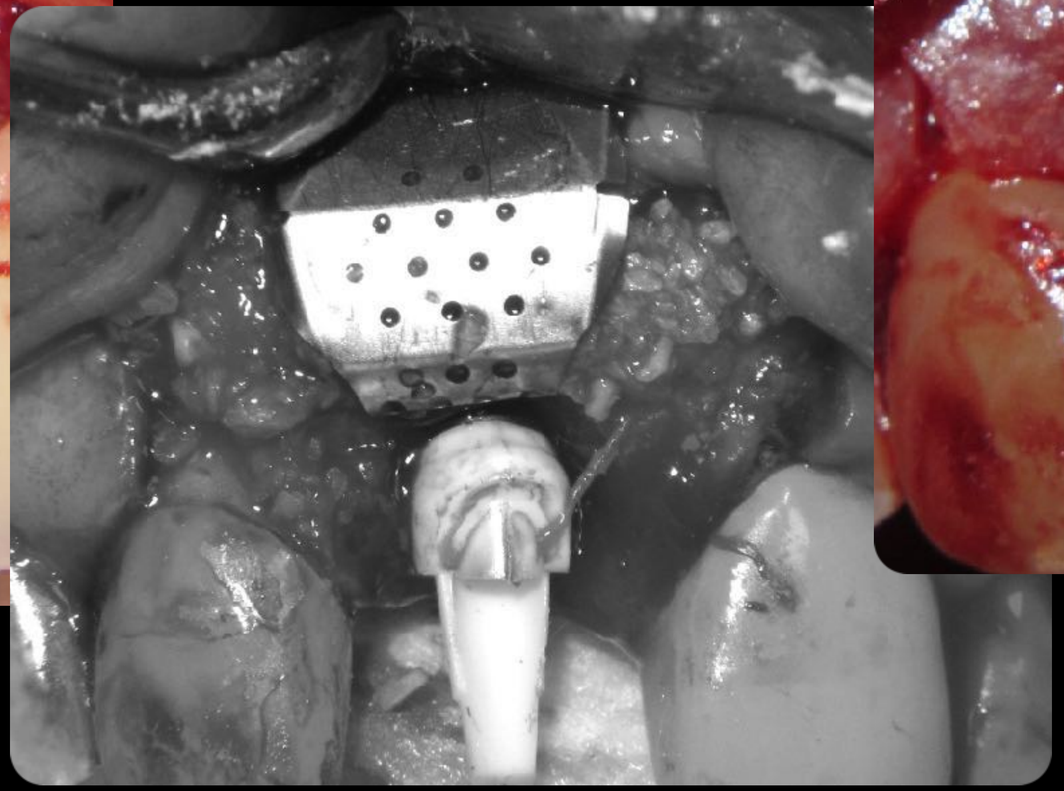

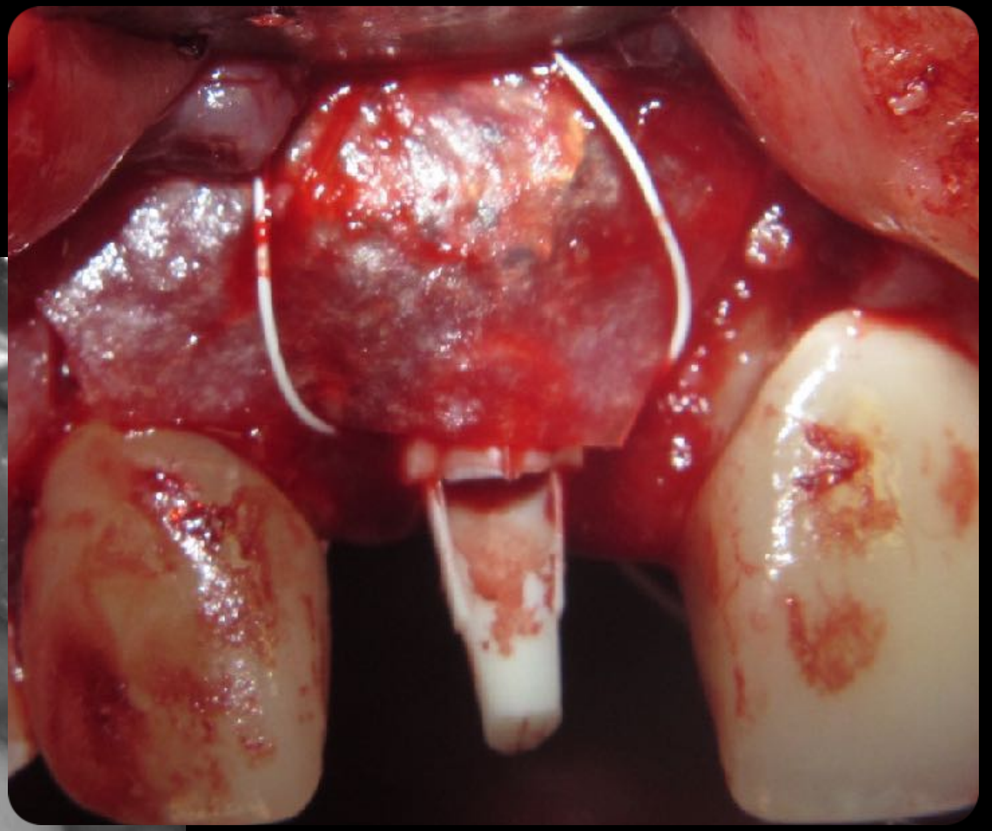

I-Gen
membrane

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Hindawi Publishing Corporation
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Volume 2016, Article ID 5126838, 12 pages
http://dx.doi.org/10.1155/2016/5126838

Hindawi

Clinical Study

Alveolar Ridge Reconstruction with Titanium Meshes and Simultaneous Implant Placement: A Retrospective, Multicenter Clinical Study

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Objective. To evaluate horizontal bone gain and implant survival and complication rates in patients treated with titanium meshes placed simultaneously with dental implants and fixed over them. *Methods.* Twenty-five patients treated with 40 implants and simultaneous guided bone regeneration with titanium meshes (i-Gen®, MegaGen, Gyeongbuk, Republic of Korea) were selected for inclusion in the present retrospective multicenter study. Primary outcomes were horizontal bone gain and implant survival; secondary outcomes were biological and prosthetic complications. *Results.* After the removal of titanium meshes, the CBCT evaluation revealed a mean horizontal bone gain of 3.67 mm (±0.89). The most frequent complications were mild postoperative edema (12/25 patients: 48%) and discomfort after surgery (10/25 patients: 40%); these complications were resolved within one week. Titanium mesh exposure occurred in 6 patients (6/25 : 24%): one of these suffered partial loss of the graft and another experienced complete graft loss and implant failure. An implant survival rate of 97.5% (implant-based) and a peri-implant marginal bone loss of 0.43 mm (±0.15) were recorded after 1 year. *Conclusions.* The horizontal ridge reconstruction with titanium meshes placed simultaneously with dental implants achieved predictable satisfactory results. Prospective randomized controlled trials on a larger sample of patients are required to validate these positive outcomes.

1. Introduction

Dental implants are a predictable treatment procedure for the prosthetic rehabilitation of partially and fully edentulous patients [1–3].

An adequate bone volume is required for insertion of dental implants [4, 5]; the absence of a sufficient amount of horizontal and vertical bone is a problem that can affect the survival and success rates of dental implants in the short, medium, and long term [4, 5].

Since frequently patients present with bone defects of variable entity [4, 5], different surgical techniques have been proposed to restore the ideal anatomical conditions required for implant insertion or to allow simultaneously positioned implants to succeed [6–14]. These techniques include onlay/inlay bone grafting [6, 7], distraction osteogenesis [8], maxillary sinus augmentation [9], inferior alveolar nerve transposition [10], alveolar ridge split [11], and guided bone regeneration (GBR) with resorbable [12] and nonresorbable membranes, such as those in polytetrafluoroethylene (PTFE) [13] or titanium [14].

GBR is considered one of the most predictable of these techniques in terms of clinical outcomes, as reported by several systematic reviews of the literature [12–15], particularly

...tes of i-Gen 45 cases

...ears after loading

97.5%

1/2013 - 4/2016

1 failure
3 early exposures

For Lifetime Smiles
MINEC
MegaGen International Network of Education & Clinical Research
www.imegagen.com
MegaGen Implant. Co., LTD.

Megagen International Network of Education and Clinical Research

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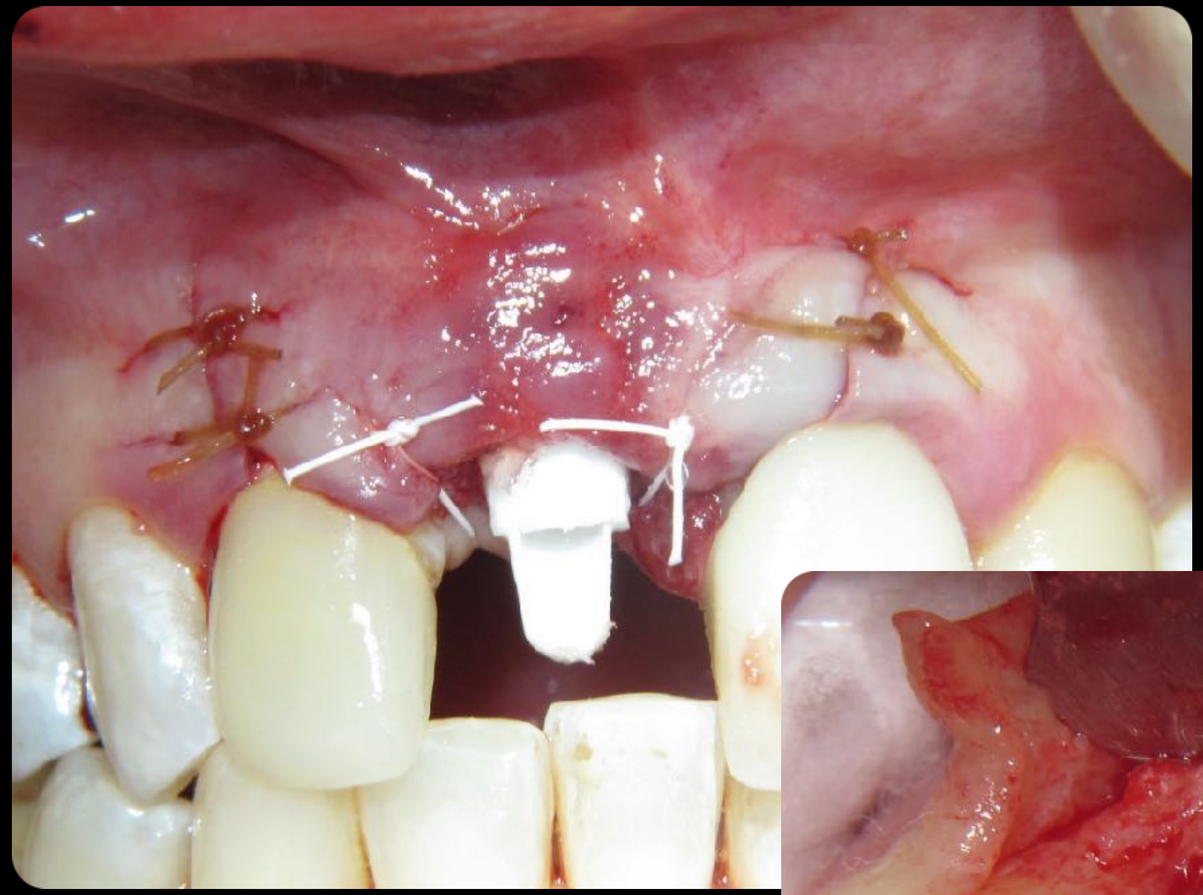
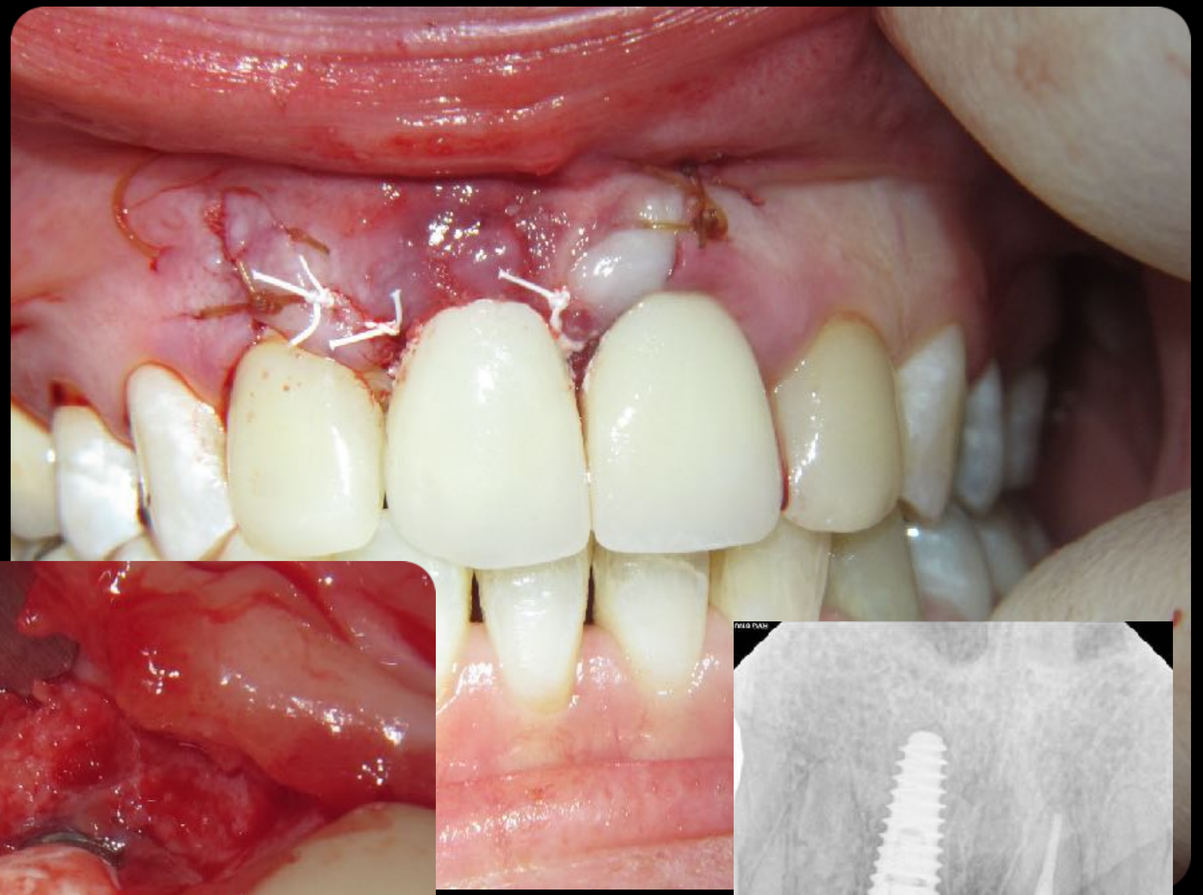
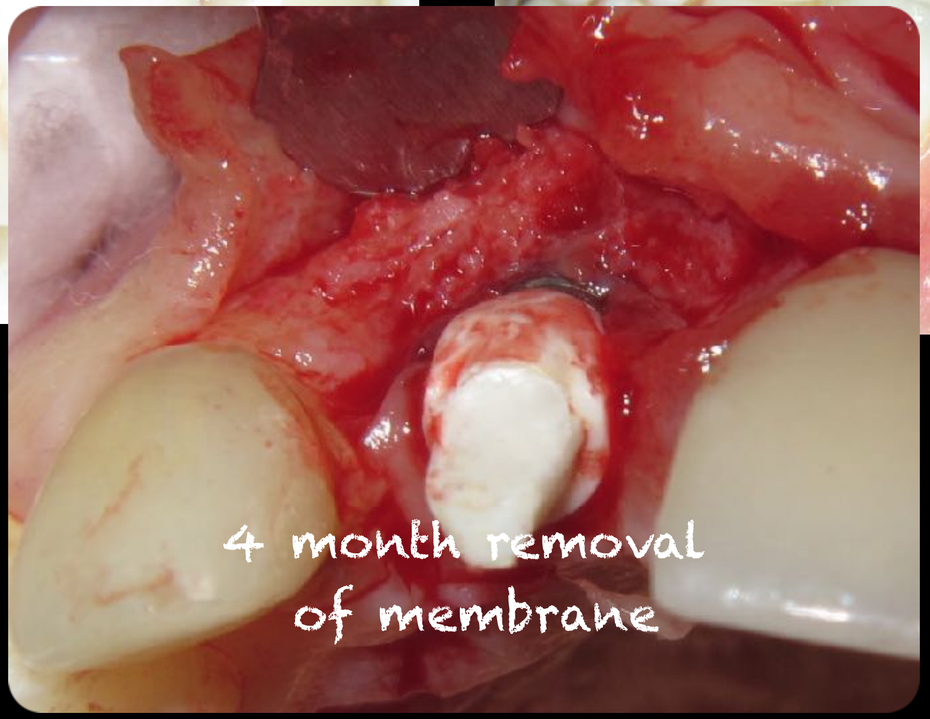
Fuse abutment

Temp







4 month removal
of membrane

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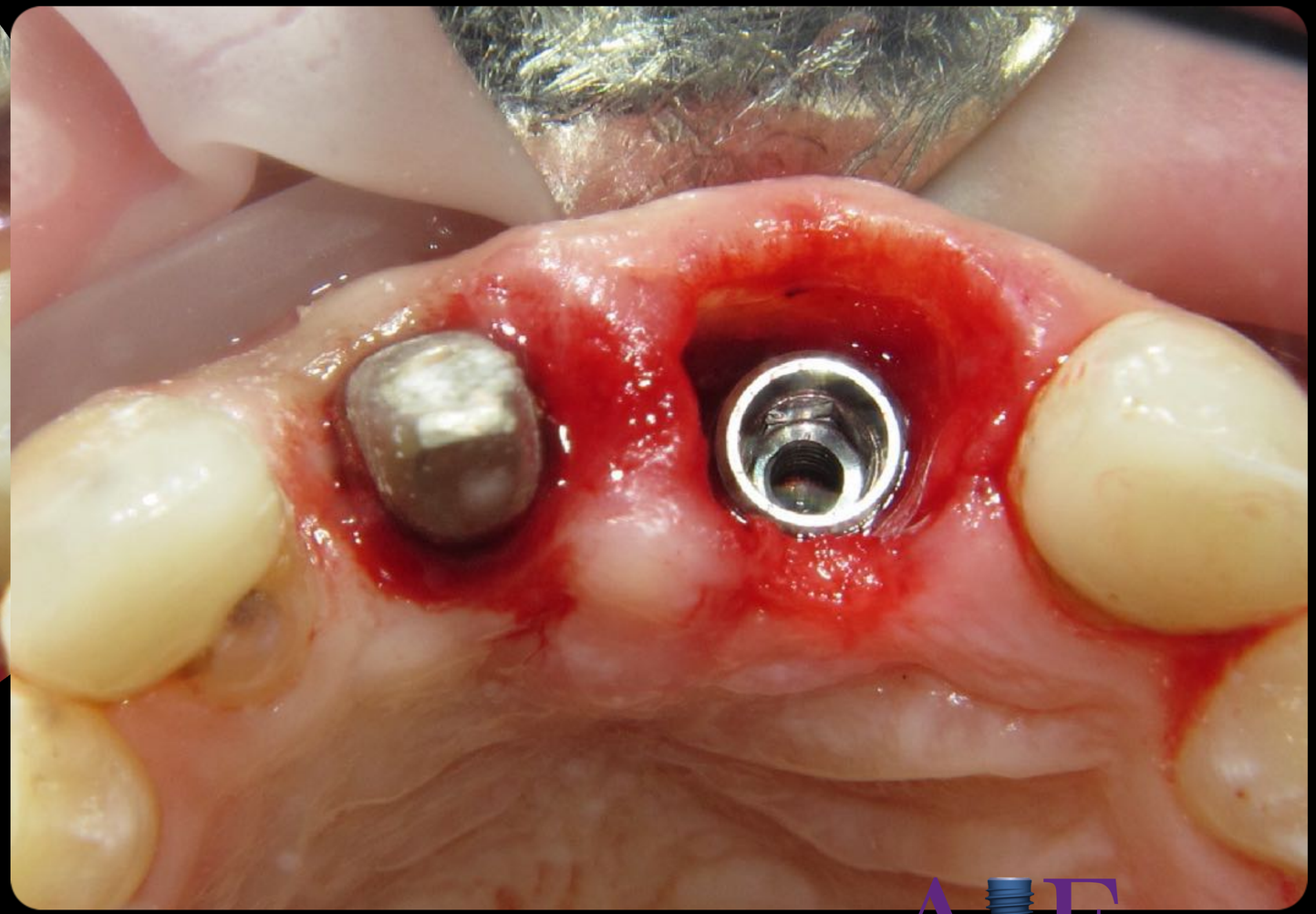
6 months later adjacent tooth fractures
PET employed



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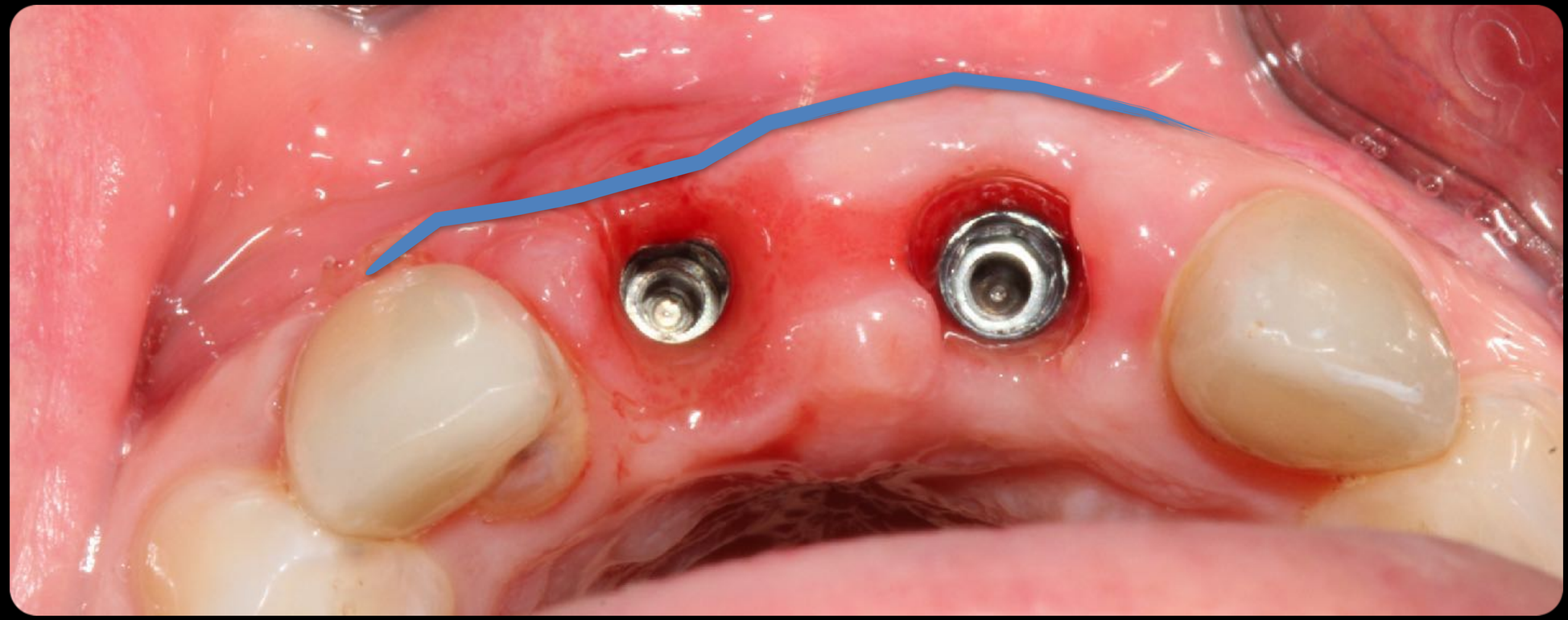
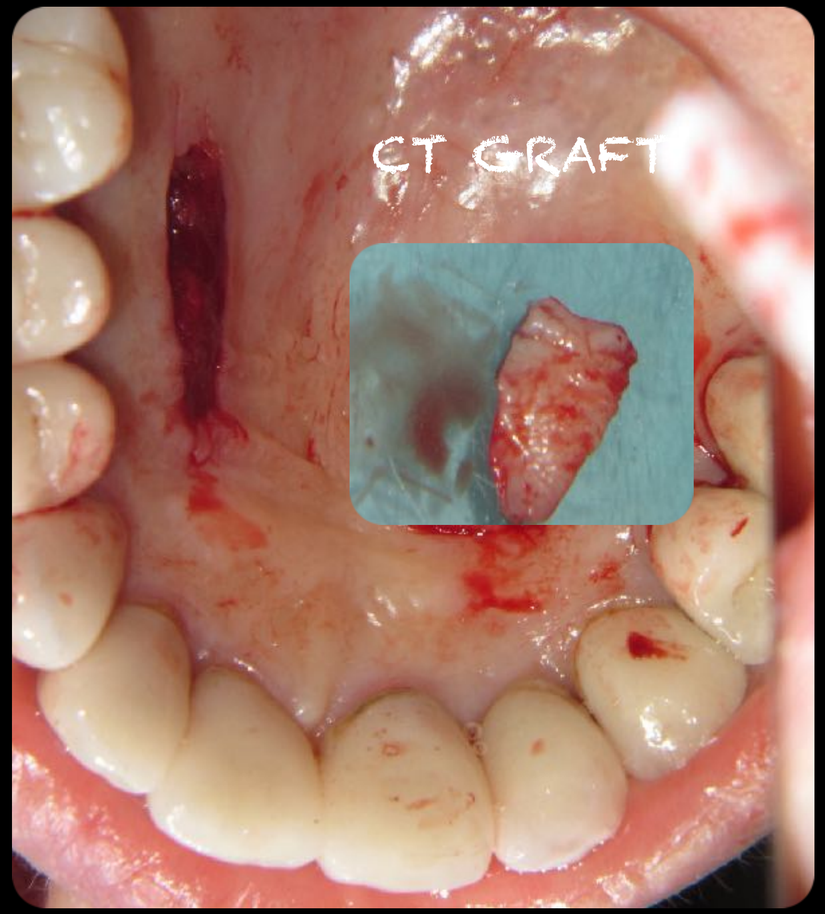
13 months

GBR

6 months

Socket shield





GBR/CT GRAFT Socket shield

16 DAY post CT graft

4 year Post op

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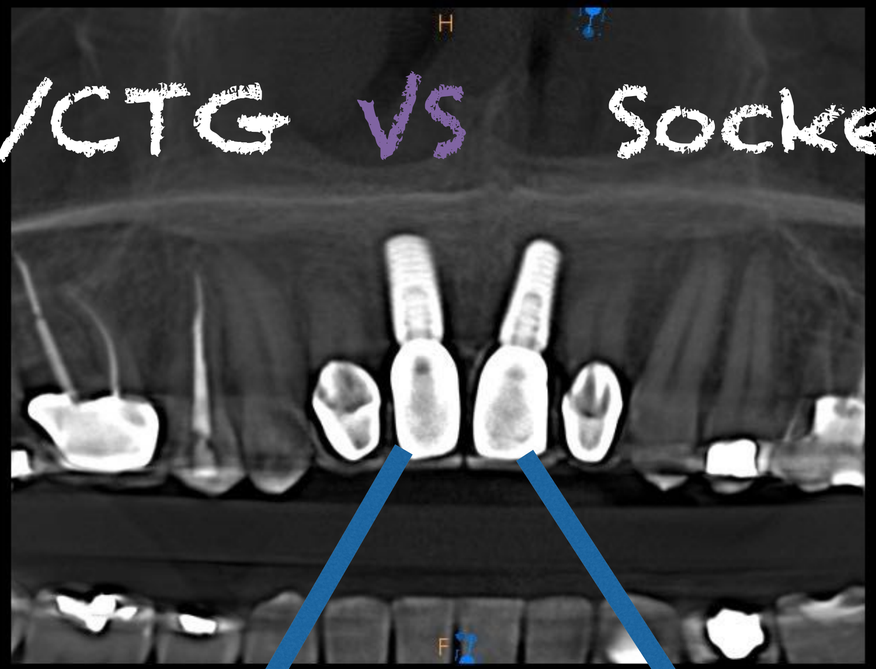
GBR/CTG VS Socket shield

EXTRACT

Implant

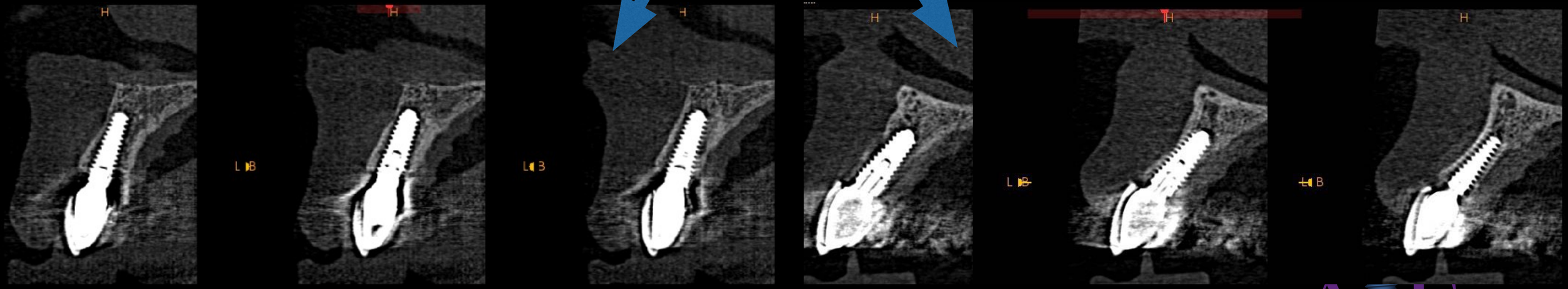
GBR Ti-Mesh

CTG



EXTRACT

Implant



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GBI hield

Partial Extraction Therapies (PET) Part 1: Maintaining Alveolar Ridge Contour at Pontic and Immediate Implant Sites

Howard Gluckman, BDS, MChD (OMP)[1]
Maurice Salama, DDS[2]
Jonathan Du Toit, BChD, Dipl Implantol, Dip Oral Surg, MSc Dent[3]

Buccopalatal collapse of the postextraction ridge is a significant challenge in restorative and implant dentistry. A variety of ridge preservation techniques using tissue and augmentative materials have been proposed in the literature. A slightly different approach is to use the tooth itself. Root submergence has been reported in the literature for more than 4 decades, and it has been demonstrated that the submerged tooth root retains the periodontal tissues and preserves the bone in pontic sites or below dentures to retain the ridge. The socket-shield technique entails prepering a tooth root section simultaneous to immediate implant placement and has demonstrated histologic and clinical results that are highly promising to esthetic implant treatment. The pontic shield technique preserves the alveolar ridge at sites intended for pontic development where the root submergence technique is not possible. The aforementioned techniques collectively may be termed partial extraction therapies (PET), a term newly introduced into the literature and clinical environment. This article is a review of these ridge preservation therapies, providing a classification and a guide to their application. Int J Periodontics Restorative Dent 2016;36:681–687. doi: 10.11607/prd.2783

[1]Specialist in Periodontics and Oral Medicine, Director of the Implant and Aesthetic Academy, Cape Town, South Africa.
[2]Clinical Assistant Professor of Periodontics, University of Pennsylvania, Philadelphia, Pennsylvania, USA; Medical College of Georgia, Augusta, Georgia, USA; Private Practice, Atlanta, Georgia, USA.
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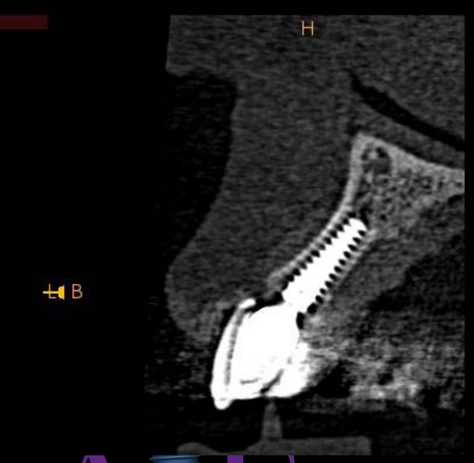
Email: docg@drhoimplantclinic.co.za

Ridge resorption as a result of tooth loss is well reported in the literature.[1] This loss of alveolar bone and change in ridge contour is the result of the bundle bone-periodontal ligament (BB-PDL) complex lost following the removal of a tooth.[2,3] To restore an edentulous or partially dentate patient in many instances requires management of these resorbed sites by careful surgical intervention. The literature is abundant with guidelines to limit tissue loss (ridge preservation techniques) or restore the ridge architecture (bone and soft tissue augmentation).[4,5] However, none of these circumvent the primary cause of resorption, ultimately resulting in partial or total ridge collapse.[3] Partial extraction therapies (PET) represent a subgroup of precollapse interventions that collectively use the tooth itself to offset the loss of alveolar tissue. By retaining the tooth root and its attachment to bone, the BB-PDL complex with its vascular supply may be mainteined. Root submergence has been demonstrated with success in the preservation of the postextraction ridge and development of pontic sites.[6,7] However, the technique is limited by apical pathology and endodontic treatment requiring an alternative partial extraction therapy.

The socket-shield technique introduced by Hürzeler et al uses the



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GBR/CTG VS Socket shield

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Partial Extraction Therapies (PET) Part 1: Maintaining Alveolar Ridge Contour at Pontic and Immediate Implant Sites

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Jonathan Du Toit, BCHD, Dipl Implantol, Dip Oral Surg, MSc Dent*

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‡Postgraduate, Department of Periodontology and Oral Medicine, School of Dentistry, Faculty of Health Sciences, University of Pretoria, South Africa.
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Table 1: Comparative tabulation of procedures to manage the effects of post-extraction resorption adjunct to implant therapy

Advantages	Disadvantages
GBR	
Tissues gains	Surgically invasive (autogenous)
Well supported in the literature	Technique sensitive
	Additional healing time
	Additional co-morbidity
	Additional expense (xeno / allograft)
	Additional risk of infection / complication
	Vertical gains are challenging
Sub-epithelial connective tissue graft	
Reliable, predictable	Surgically invasive (autogenous)
Well supported in the literature	Technique sensitive
No additional material cost	Additional healing time
	Additional co-morbidity
Socket-shield technique	
No additional material cost	Not yet reliable or predictable
No co-morbidity	No long-term data yet
Single surgery	Technique sensitive
Applicable in sites with endodontic apical pathology	

*Gluckman and Salama

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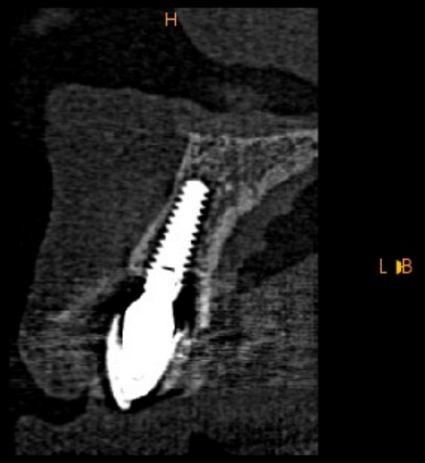

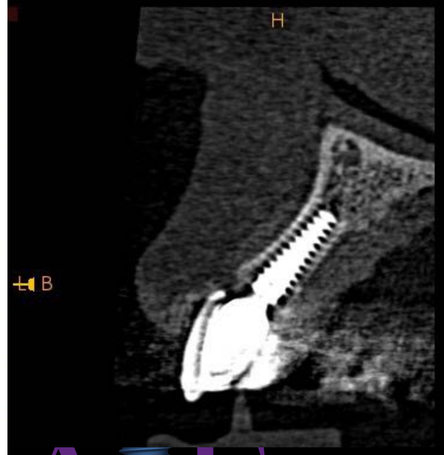

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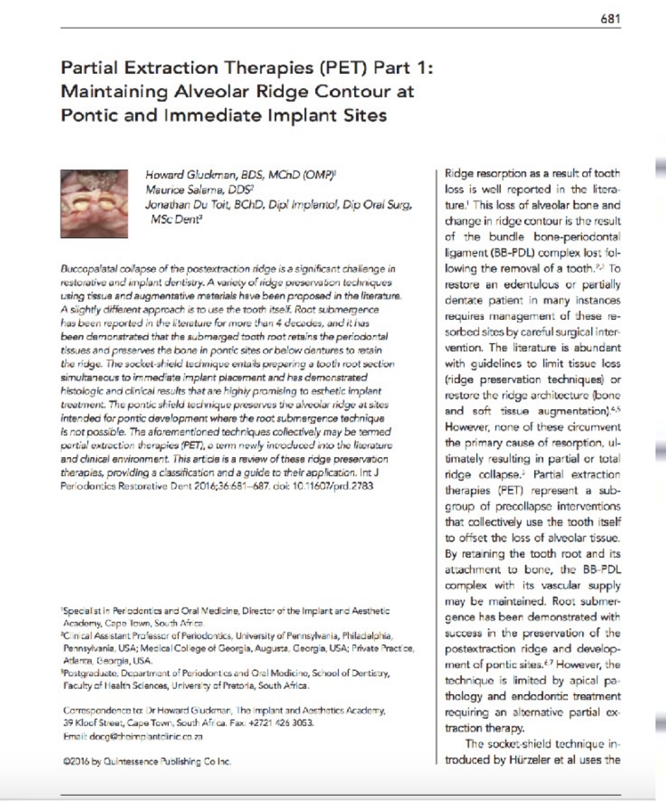

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Buccopalatal collapse of the postextraction ridge is a significant challenge in restorative and implant dentistry. A variety of ridge preservation techniques using tissue and augmentative materials have been proposed in the literature. A slightly different approach is to use the tooth itself. Root submergence has been reported in the literature for more than 4 decades, and it has been demonstrated that the submerged tooth root retains the periodontal tissues and preserves the bone in pontic sites or below dentures to retain the ridge. The socket-shield technique entails preparing a tooth root section simultaneous to immediate implant placement and has demonstrated histologic and clinical results that are highly promising to esthetic implant treatment. The pontic shield technique preserves the alveolar ridge at sites intended for pontic development where the root submergence technique is not possible. The aforementioned techniques collectively may be termed partial extraction therapies (PET), a term newly introduced into the literature and clinical environment. This article is a review of these ridge preservation therapies, providing a classification and a guide to their application. Int J Periodontics Restorative Dent 2016;36:681–687. doi: 10.11607/prd.2783

Ridge resorption as a result of tooth loss is well reported in the literature.[1] This loss of alveolar bone and change in ridge contour is the result of the bundle bone-periodontal ligament (BB-PDL) complex lost following the removal of a tooth.[2,3] To restore an edentulous or partially dentate patient in many instances requires management of these resorbed sites by careful surgical intervention. The literature is abundant with guidelines to limit tissue loss (ridge preservation techniques) or restore the ridge architecture (bone and soft tissue augmentation).[4,5] However, none of these circumvent the primary cause of resorption, ultimately resulting in partial or total ridge collapse.[3] Partial extraction therapies (PET) represent a subgroup of precollapse interventions that collectively use the tooth itself to offset the loss of alveolar tissue. By retaining the tooth root and its attachment to bone, the BB-PDL complex with its vascular supply may be maintained. Root submergence has been demonstrated with success in the preservation of the postextraction ridge and development of pontic sites.[6,7] However, the technique is limited by apical pathology and endodontic treatment requiring an alternative partial extraction therapy.

The socket-shield technique introduced by Hürzeler et al uses the

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Surgically invasive (autogenous)

Technique sensitive

Additional healing time

Additional co-morbidity

Socket-shield technique

~~Not yet reliable or predictable~~

~~No long-term data yet~~

~~Technique sensitive~~

*Gluckman and Salama