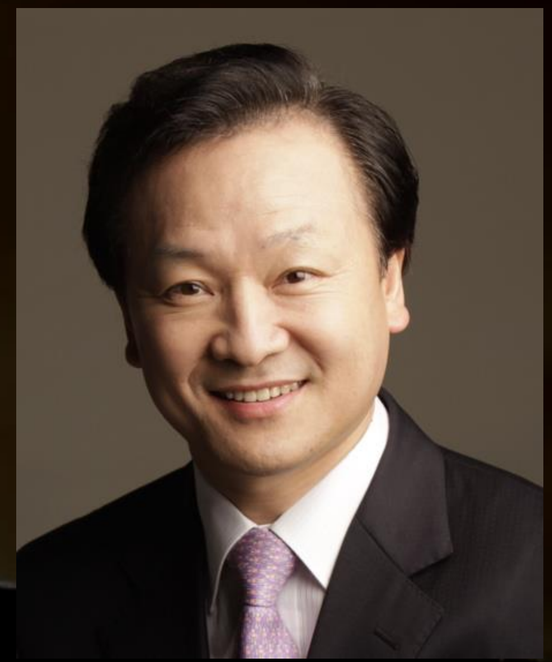
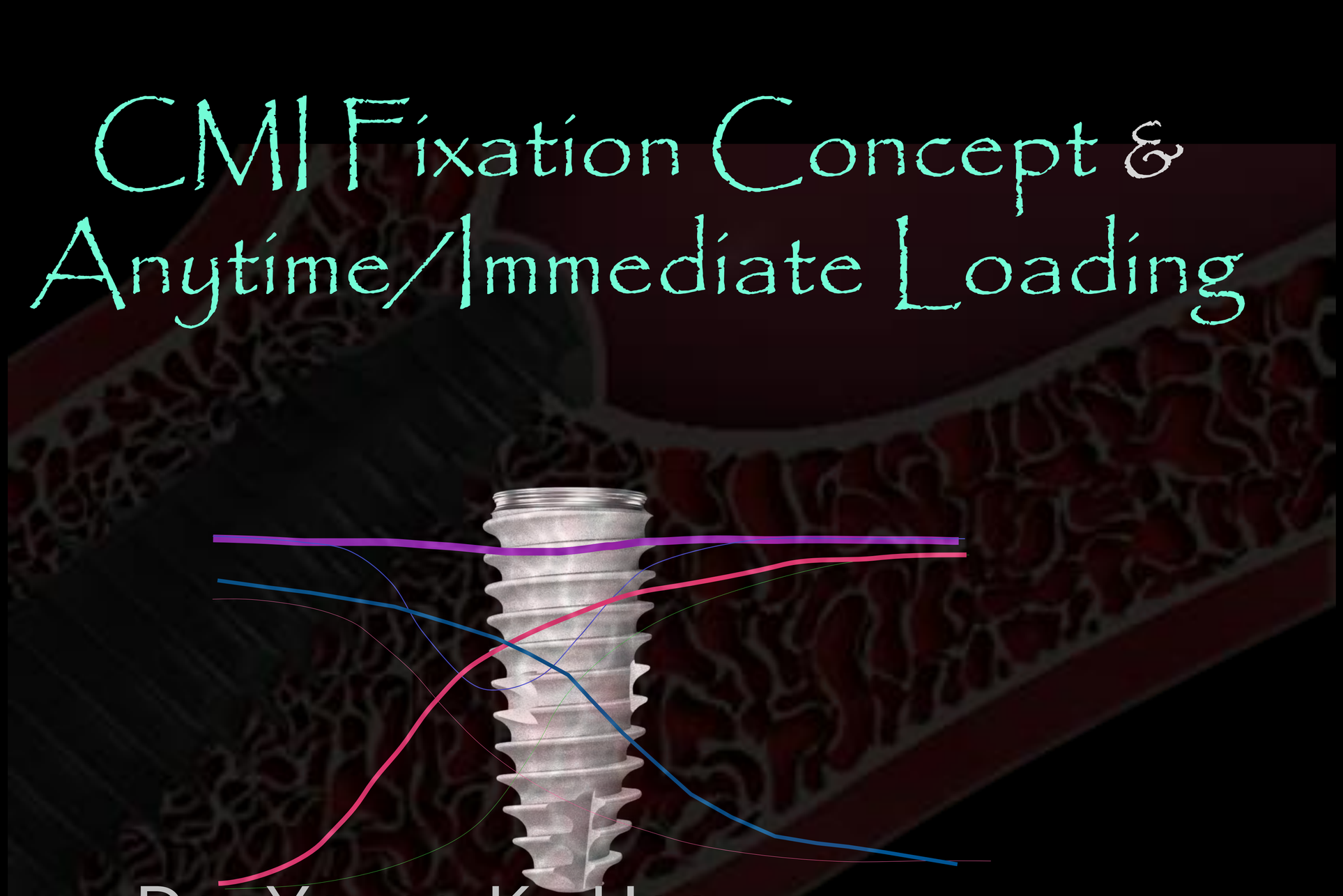
Dr. Young-Ku, Heo DDS, MSD, PhD



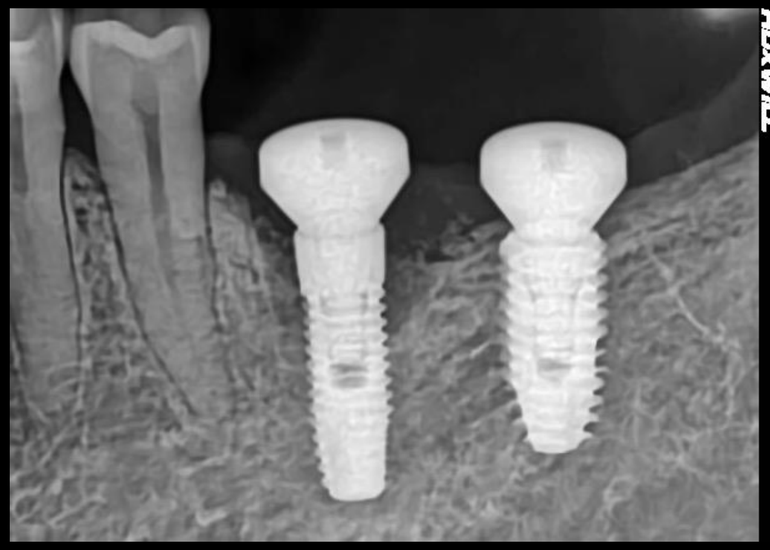
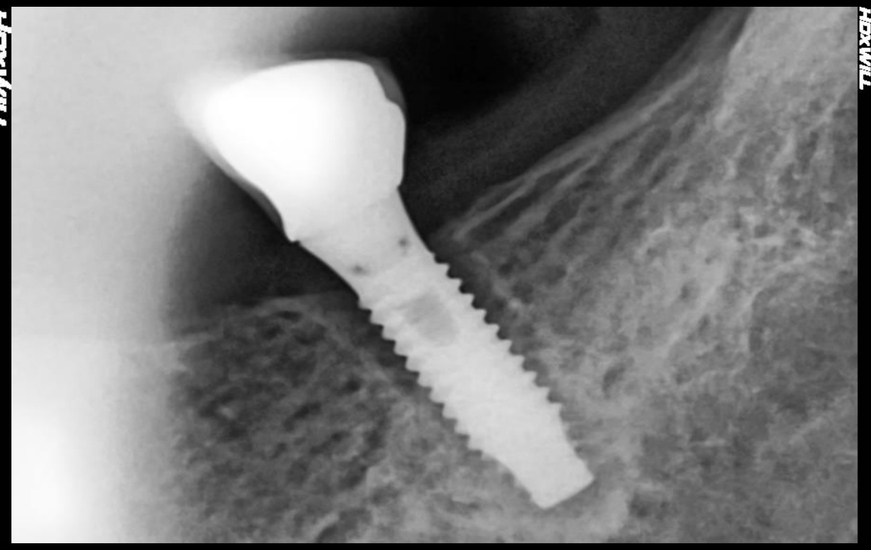
- Adjunct Clinical Prosfessor, Boston Univ. Center for Implantology
- Certified from Boston Univ. School of Dental Medicine,
  Dep of Prosthodontics
- Master Degree at Boston University
- Preceptorship, UCLA, Maxillofacial Prostheses
- PhD Degree at Catholic Medical School, Seoul
- President, GAO(Global Academy of Osseointegration)
- CEO, Neobiotech Co.
- Inventor of CMI implant, SCA, SLA, Fixture Remover, Screw Remover, CTi-mem & ACM,
Ridge wider, Neo NaviGuide, AnyCheck, etc.
- Worldwide International Speaker
(USA, Europe, South America, & Asia)

CMI Fixation Concept & Anytime/Immediate Loading



- Dr. Young-Ku Heo DDS, MS, PhD, FICD

Early Stage Osseointegration Failure


Why do they happen?

Dental implant failure rates and associated risk factors

Peter K. Moy et al IJOMI 2005

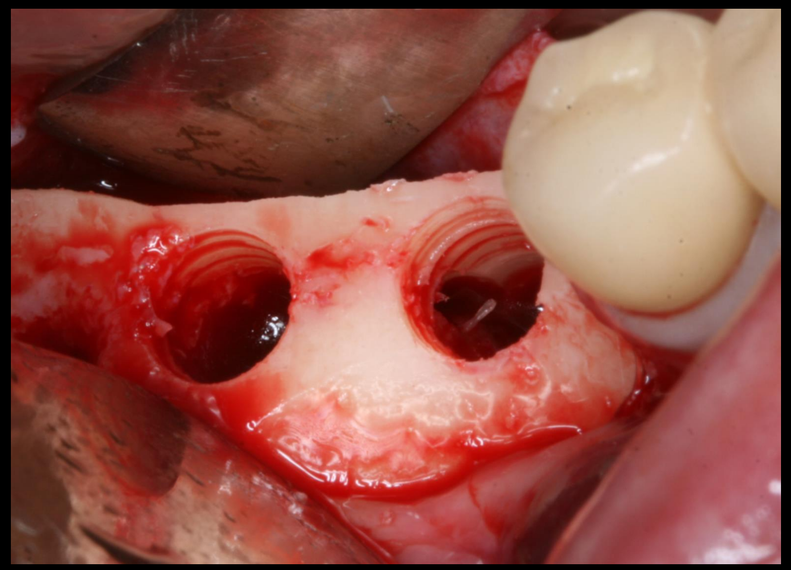
Table 1 Univariate Analysis—Relative Risk of Implant Failure

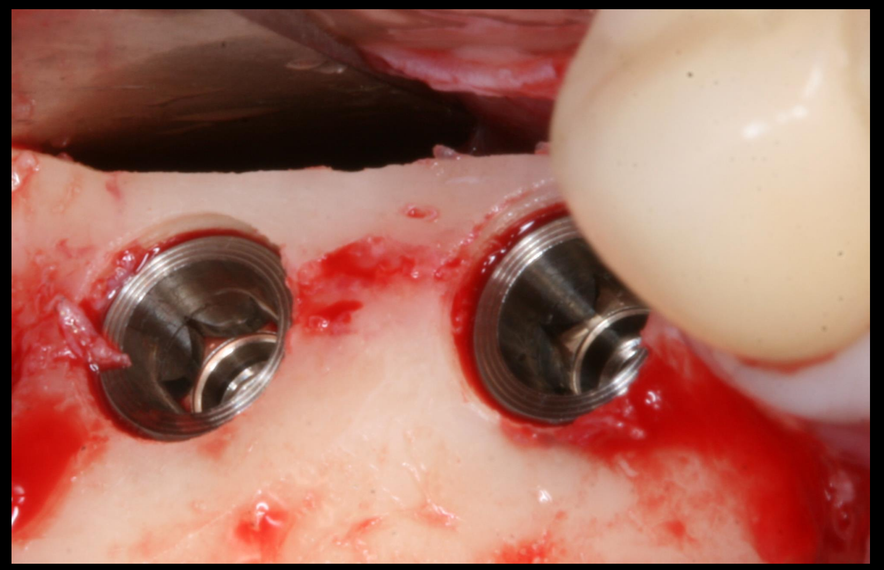
Variable	No. of patients (N = 1140)	Patient			
		Failure n (%)	Success n (%)	RR	95% CI
Age					
< 40	181	16 (8.84)	165 (91.16)	1.00	1.00
40–59	418	58 (13.30)	360 (86.70)	1.66	0.93, 2.98
60–79	499	89 (17.90)	410 (82.10)	2.24	1.28, 3.93*
> 79	42	7 (16.67)	35 (83.33)	2.06	0.78, 5.39
Gender					
Male	463	77 (16.63)	386 (83.37	1.00	1.00
Female	677	93 (13.74)	594 (86.26)	0.80	0.57, 1.11
Coexisting conditions					
Smoker	173	35 (20.23)	138 (79.77)	1.56	1.03, 2.36*
Hypertension	202	29 (14.36)	173 (85.64)	0.95	0.62, 1.46
Cardiac disease	106	16 (15.09)	90 (84.91)	1.02	0.58, 1.78
Pulmonary disease	75	10 (13.33)	65 (86.67)	0.87	0.44, 1.73
Diabetes	48	15 (31.25)	33 (68.75)	2.75	1.46, 5.18*
Steroids	78	9 (11.54)	69 (88.46)	0.73	0.36, 1.49
Chemotherapy	10	1 (10.00)	9 (90.00)	0.63	0.08, 5.02
Radiation therapy	22	7 (31.82)	15 (68.18)	2.73	1.10, 6.81*
PMHRT	161	44 (27.33)	117 (72.67)	2.55	1.72, 3.77*
No PMHRT	304	49 (16.12)	255 (83.88)	1.14	0.79, 1.63

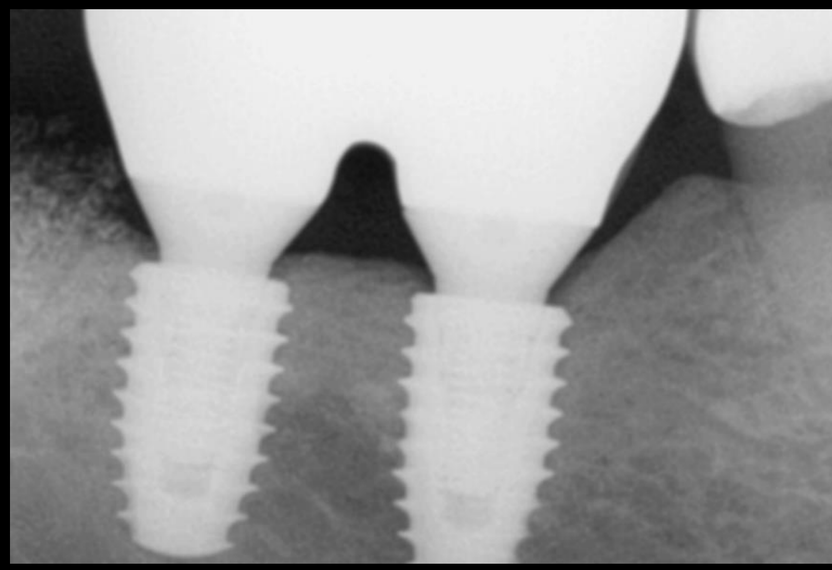
RR = Relative risk of failure.
*Significant at $P < .05$.

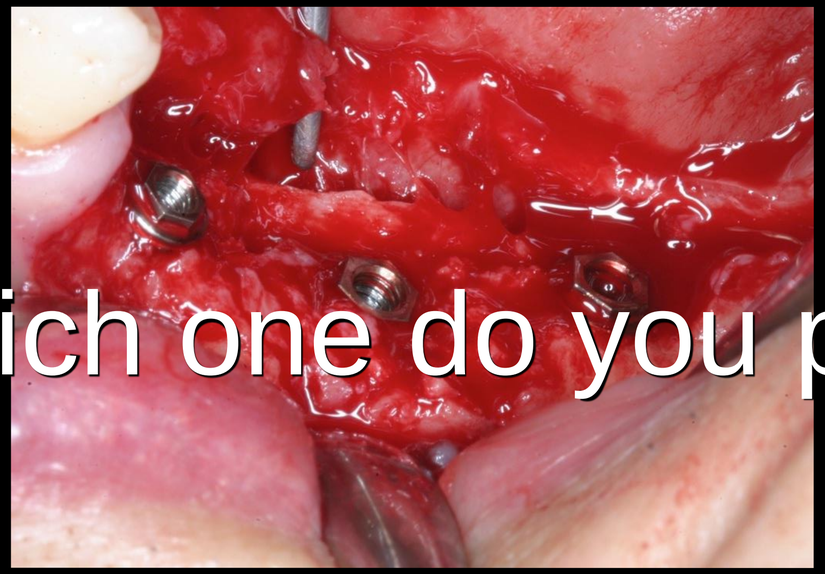
What is your failure rate?

I want to have 100% Success Rate when I place implants!!

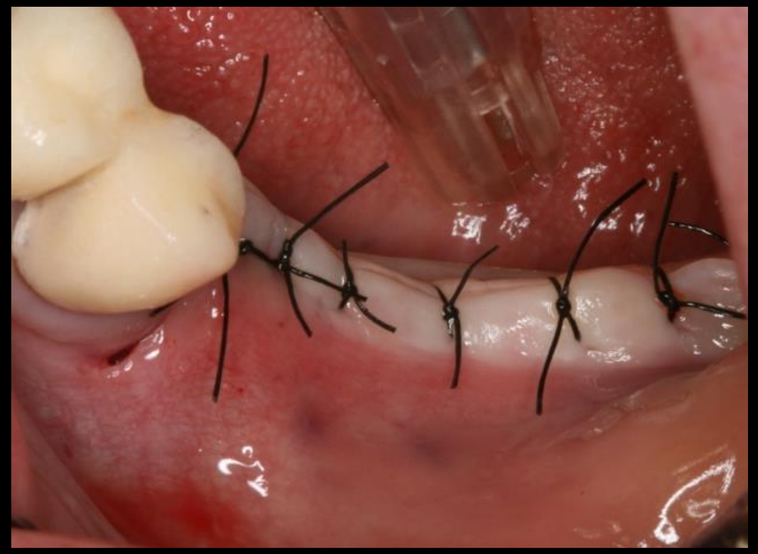




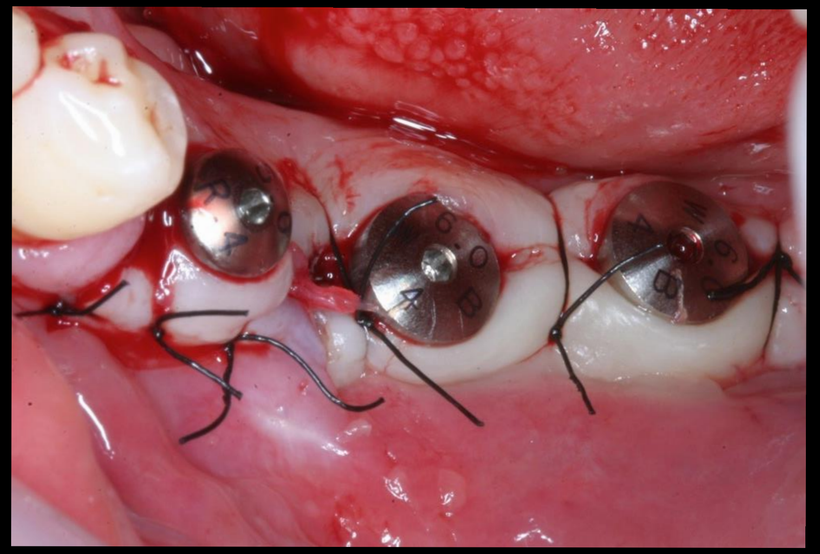




Which one do you prefer?



Submerged



Nonsubmerged

Immediate Loading

Iatrogenic Factors of Osseointegration Failure

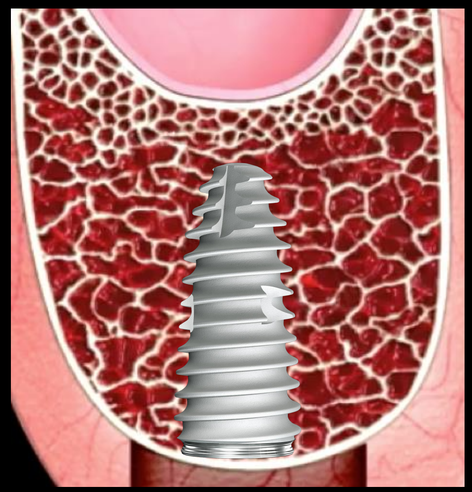
- Lack of Initial Stability
- Overload
- Overheat
- Overcompression
- Lack of Blood Supply
- Surface Contamination

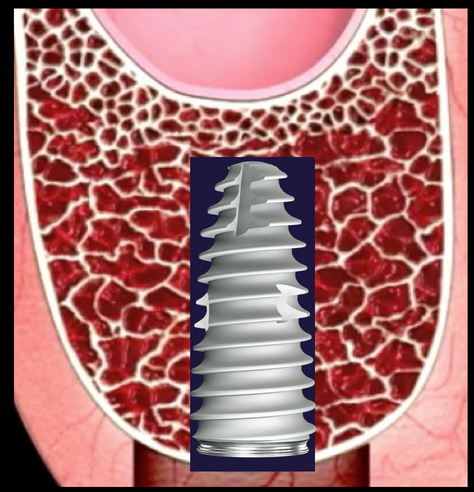
Why Osseointegration Failure?

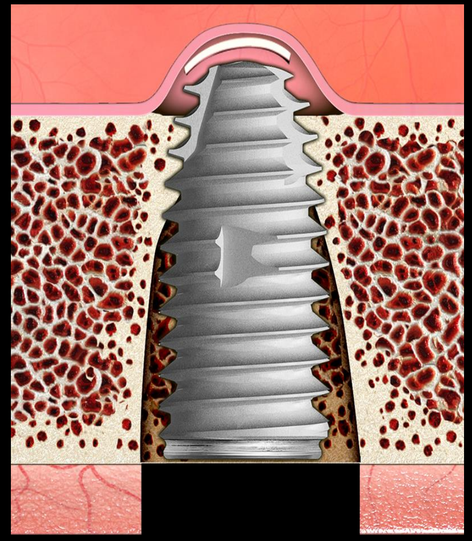
- Lack of Initial Stability
- Overload
- Overheat
- Overcompression
- Lack of Blood Supply
- Surface Contamination

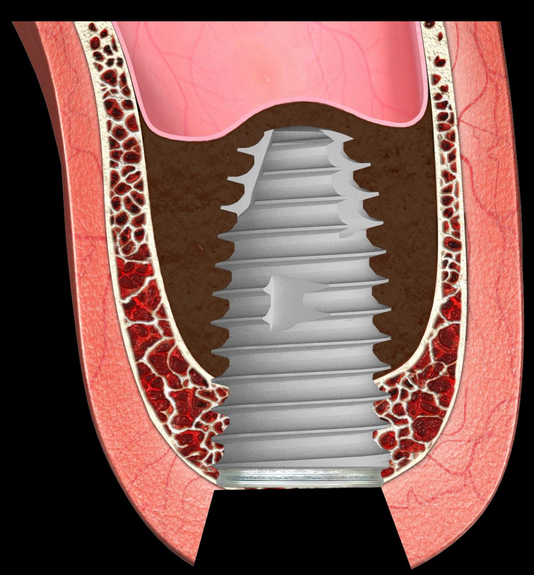
Lack of Initial Stability

- D3-D4 Low bone Density
- Oversized Drilling
- Immediate Placement
- Maxillary Sinus Area



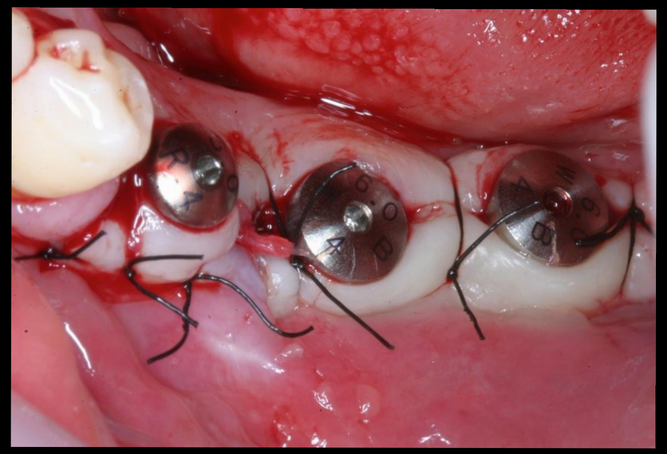






Why Osseointegration Failure?

- Lack of Initial Stability
- Overload before Osseointegration
- Overheat
- Overcompression
- Lack of Blood Supply
- Surface Contamination



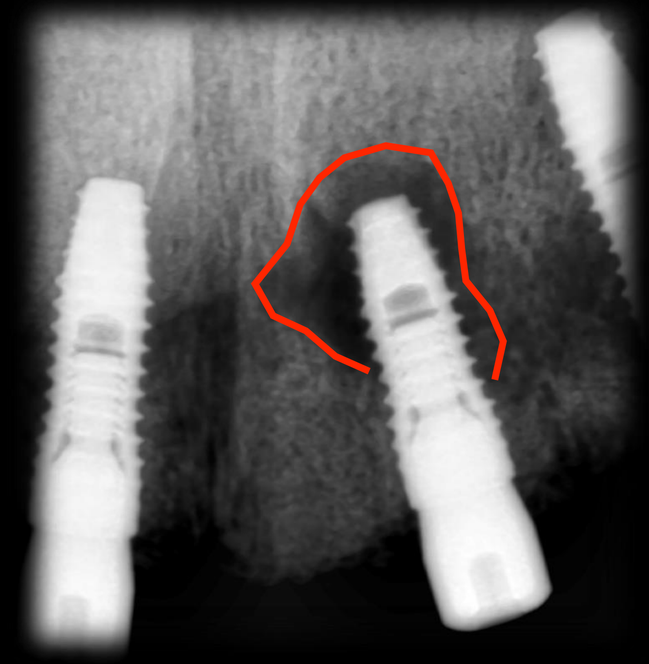
Nonsubmerged

Immediate Loading

Why Osseointegration Failure?

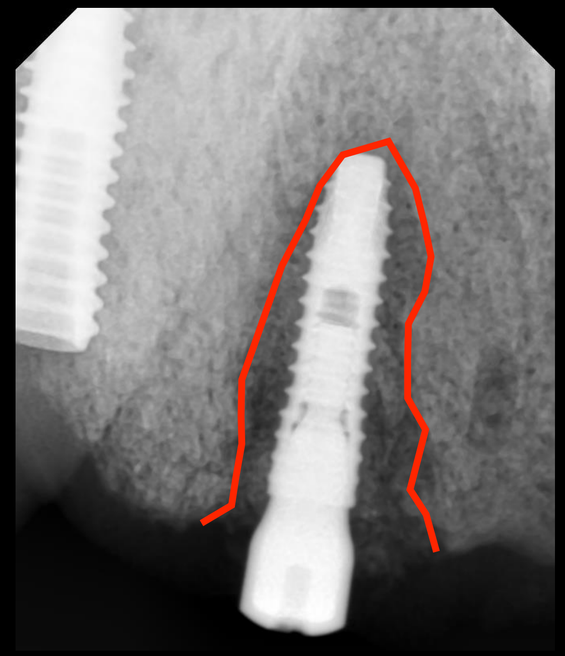
- Lack of Initial Stability
- Overload
- Overheat
- Overcompression
- Lack of Blood Supply
- Surface Contamination

Heat generation during drilling (E. Moon et al, 1995)



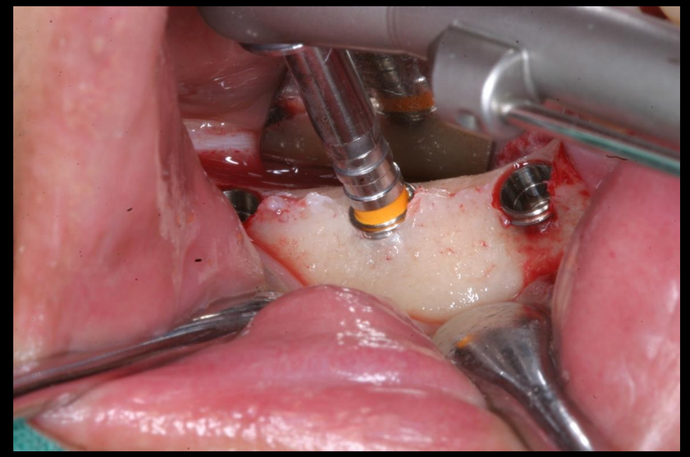
More than 44°C : Heat Damage to Bone

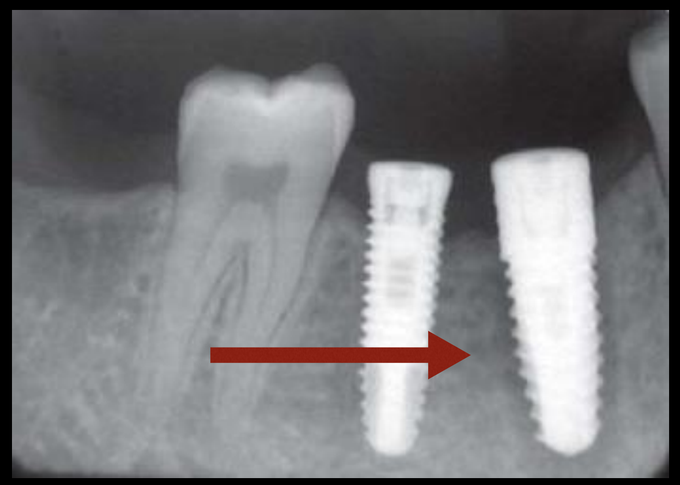
2.0 mm twist drill generates most heat up to 84.3 °C

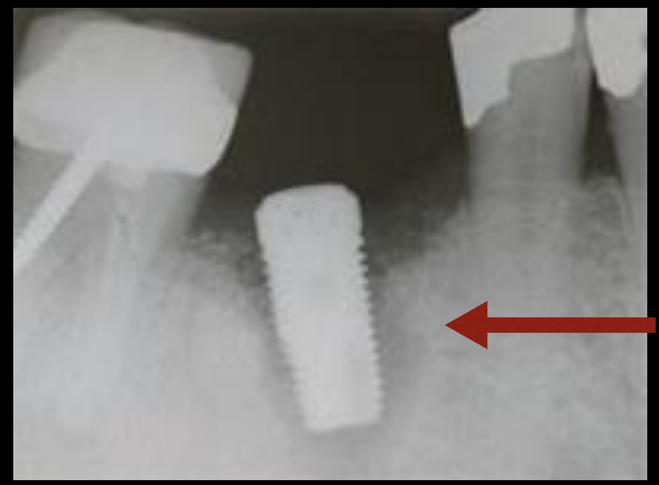


Why Osseointegration Failure?

- Lack of Initial Stability
- Overload
- Overheat
- Overcompression
- Lack of Blood Supply
- Surface Contamination



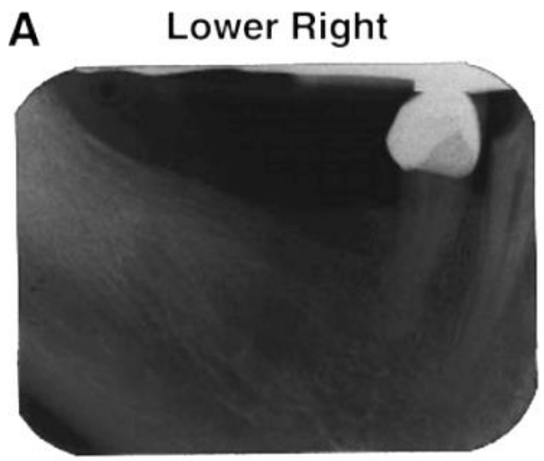


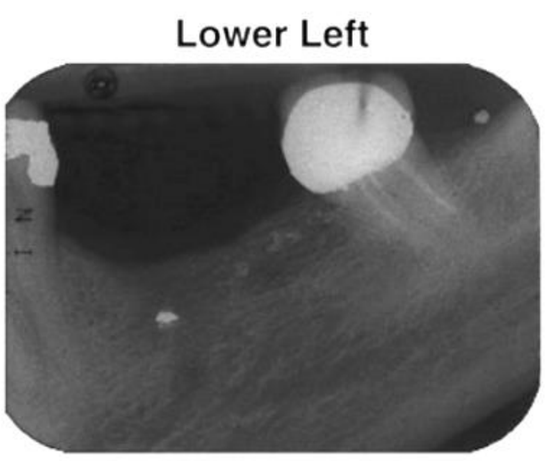


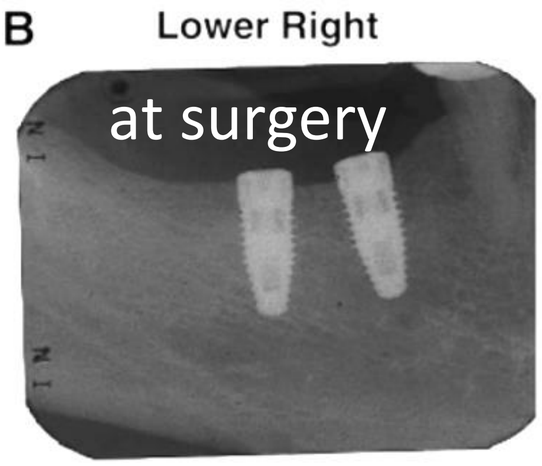
Implant Compression Necrosis: Current Understanding and Case Report

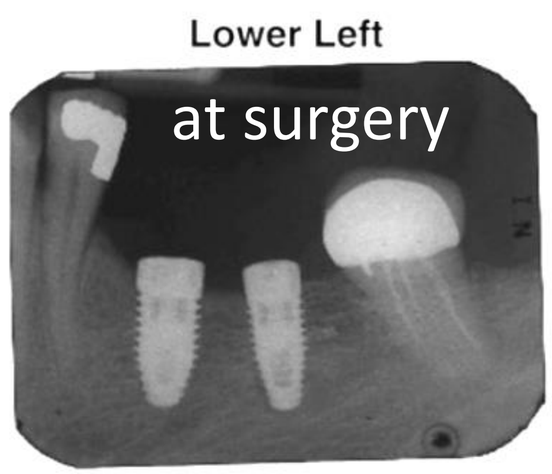
Jill D. Bashutski,* Nisha J. D'Silva,* and Hom-Lay Wang*

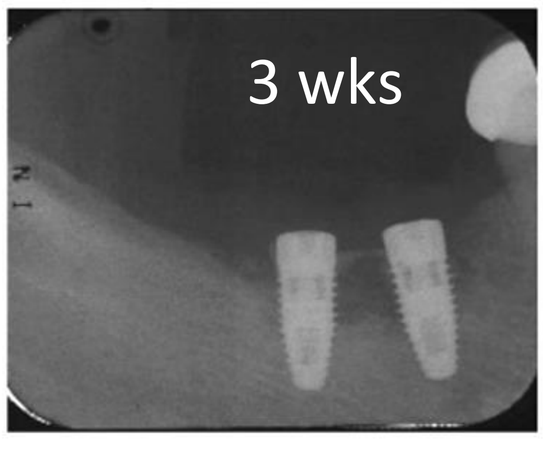
J Periodontol, April 2009





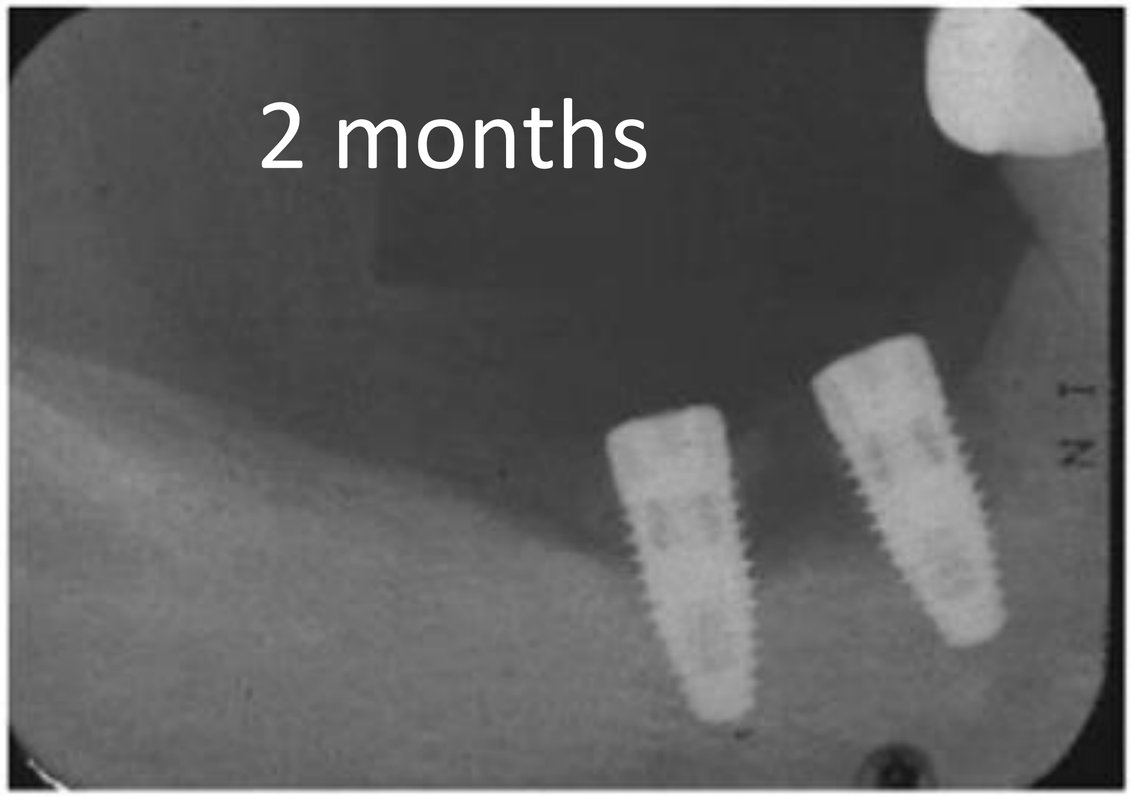




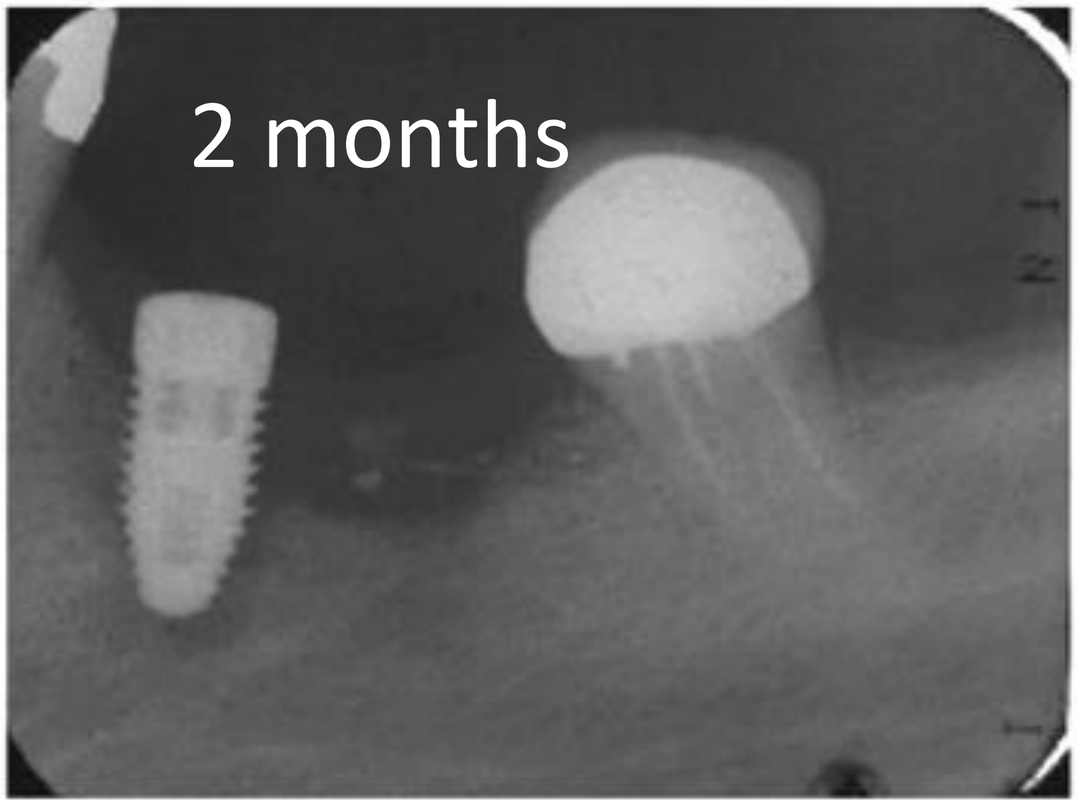


E

Lower Right

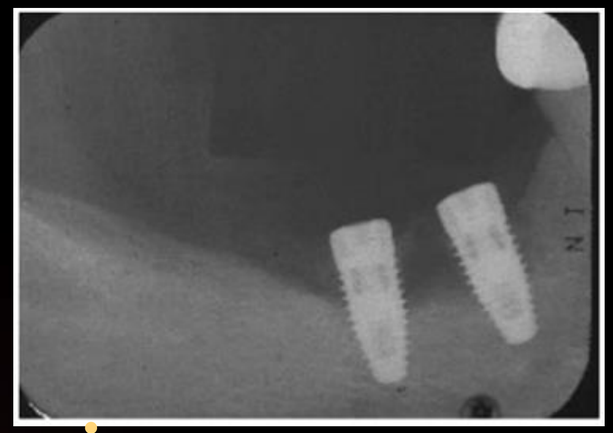


Lower Left



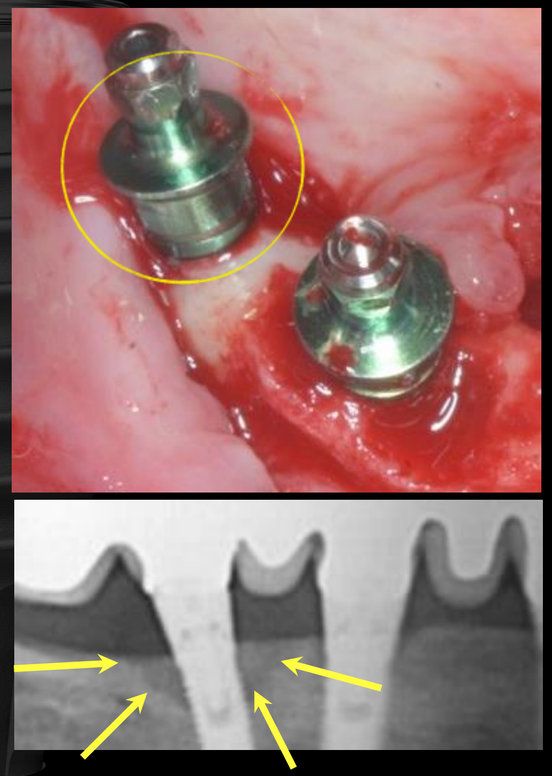
Implant Compression Necrosis: Current Understanding and Case Report

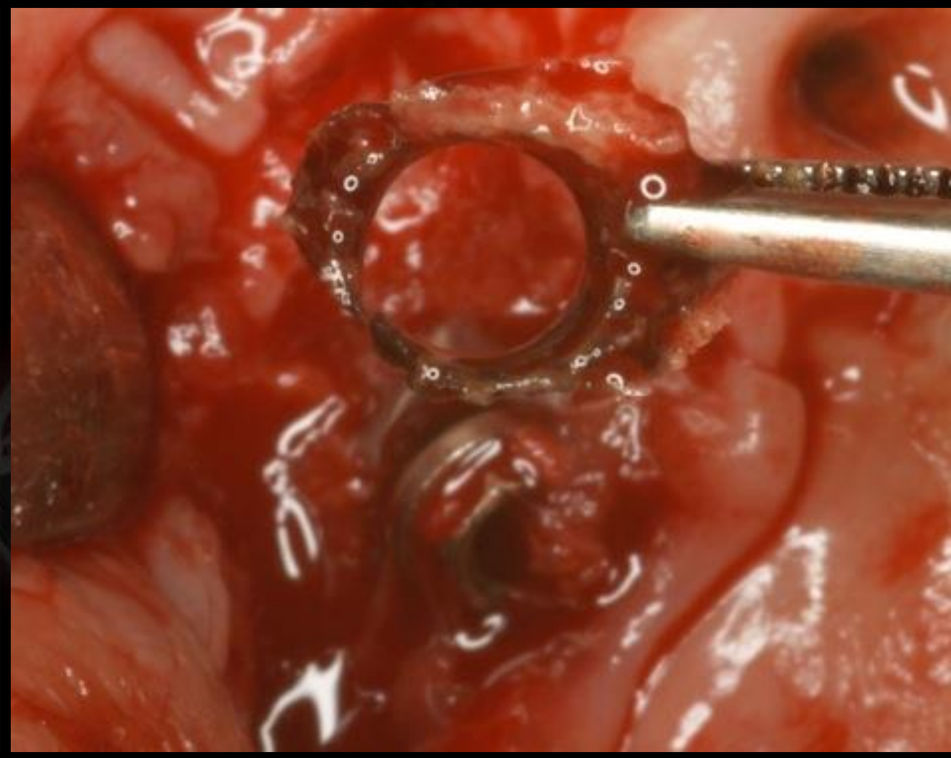
Jill D. Bashutski,* Nisha J. D'Silva,* and Hom-Lay Wang*



The bone was D2 quality, no prepping was done prior to implant placement, which would allow sufficient pressure to be transferred to adjacent bone leading to non-inflammatory

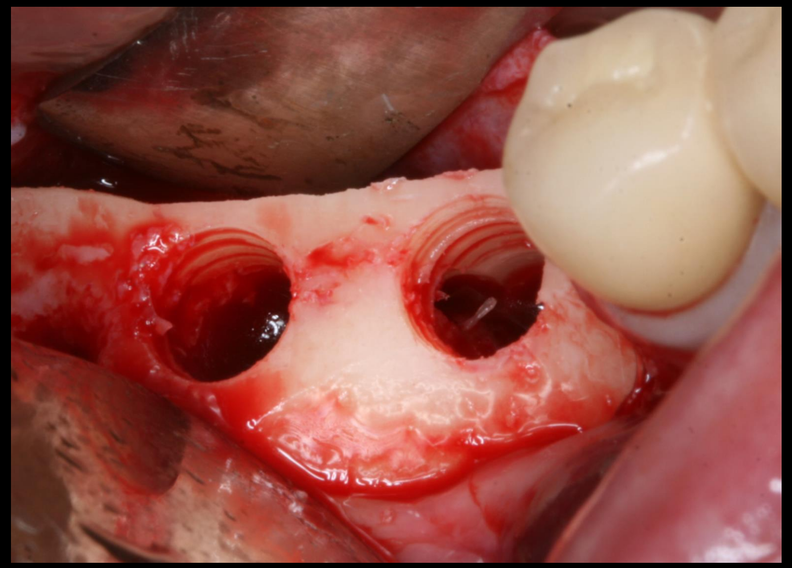
High Insertion Torque : Compression Necrosis

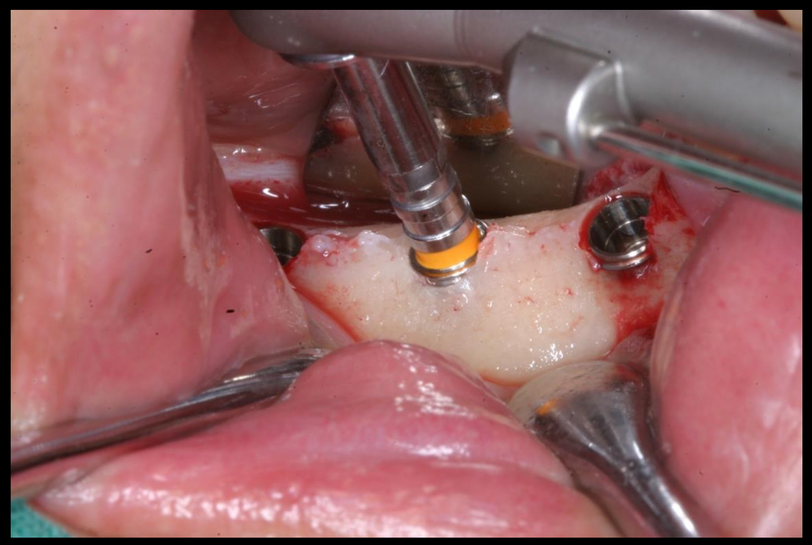




Why Osseointegration Failure?

- Lack of Initial Stability
- Overload
- Overheat
- Overcompression
- Lack of Blood Supply
- Surface Contamination





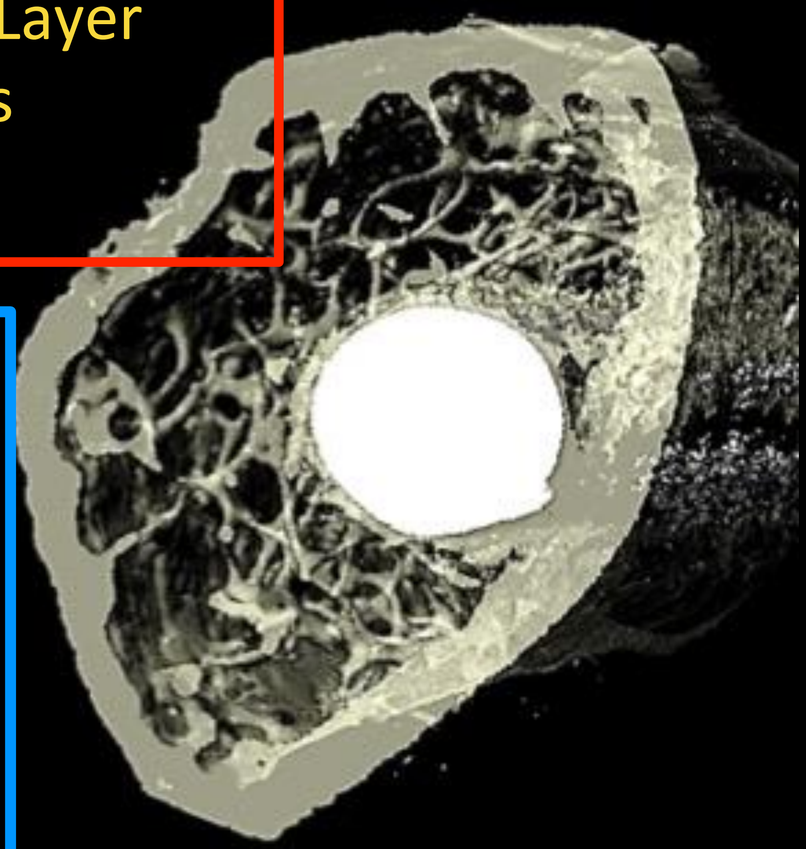
Why Osseointegration Failure?

- Lack of Initial Stability
- Overload
- Overheat
- Overcompression
- Lack of Blood Supply
- Surface Contamination, Titanium allergy, Unknown factor

‘Over-Torque’: Location Matters!

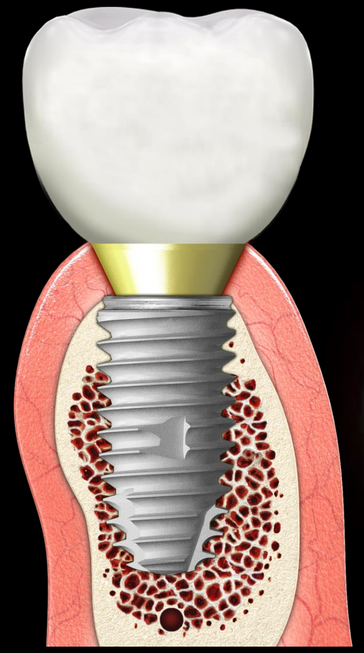
More than 50 Ncm in Cortical Layer
Possible Compression Necrosis
or Excessive bone remodeling

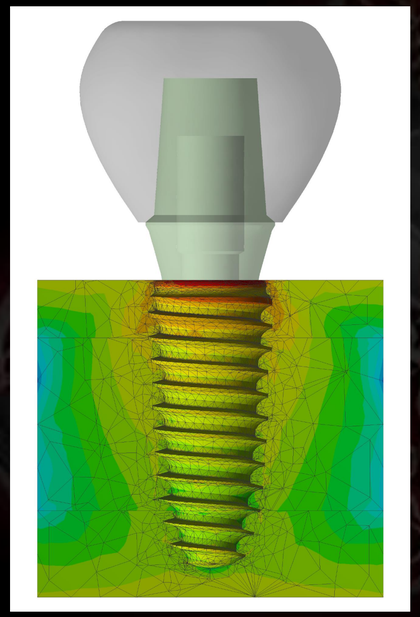
Upto 80Ncm in trabecular layer, Less possibility of Compression Necrosis due to the compaction effect of space in trabecular bone

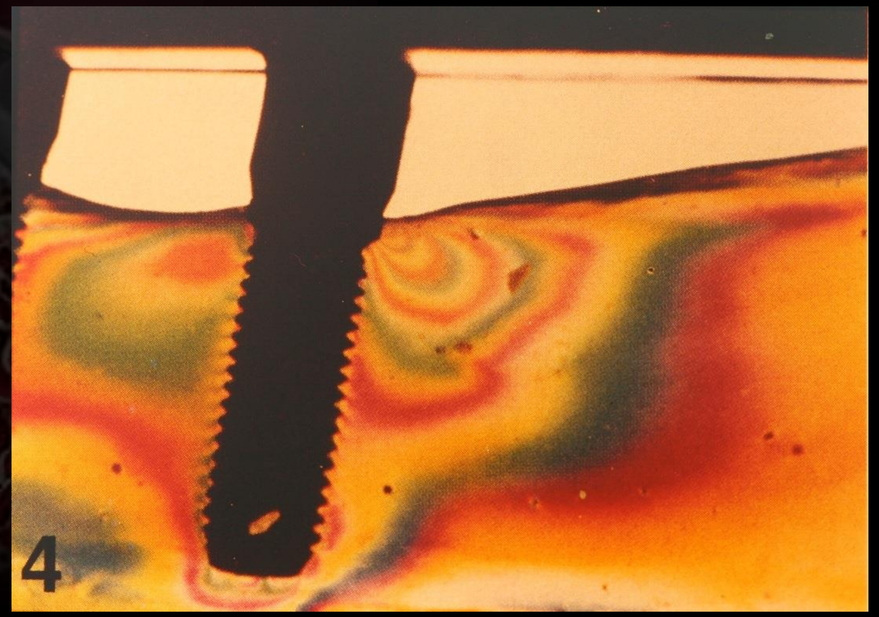


S. Park et al 2016, IADR

Most of stress is concentrated in the crestal area







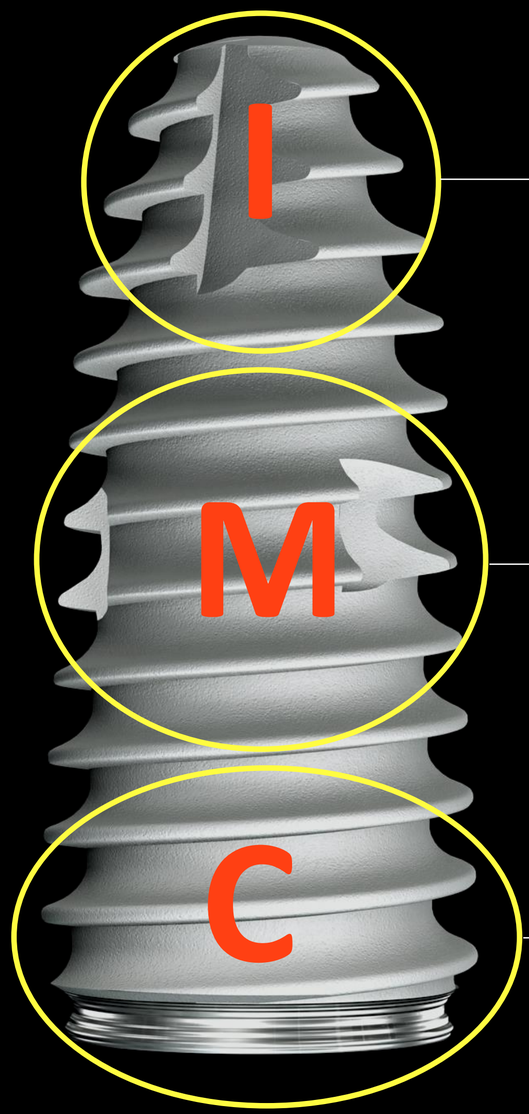
Dilemma!!

“Coronal” Fixation
is
Crucial

OverCompression
causes
Bone Loss

How to bear occlusal load while preventing bone trauma in the D1 crestal bone during the healing period??

'CMI' fixation Sinus Book 2010 Well Pub.

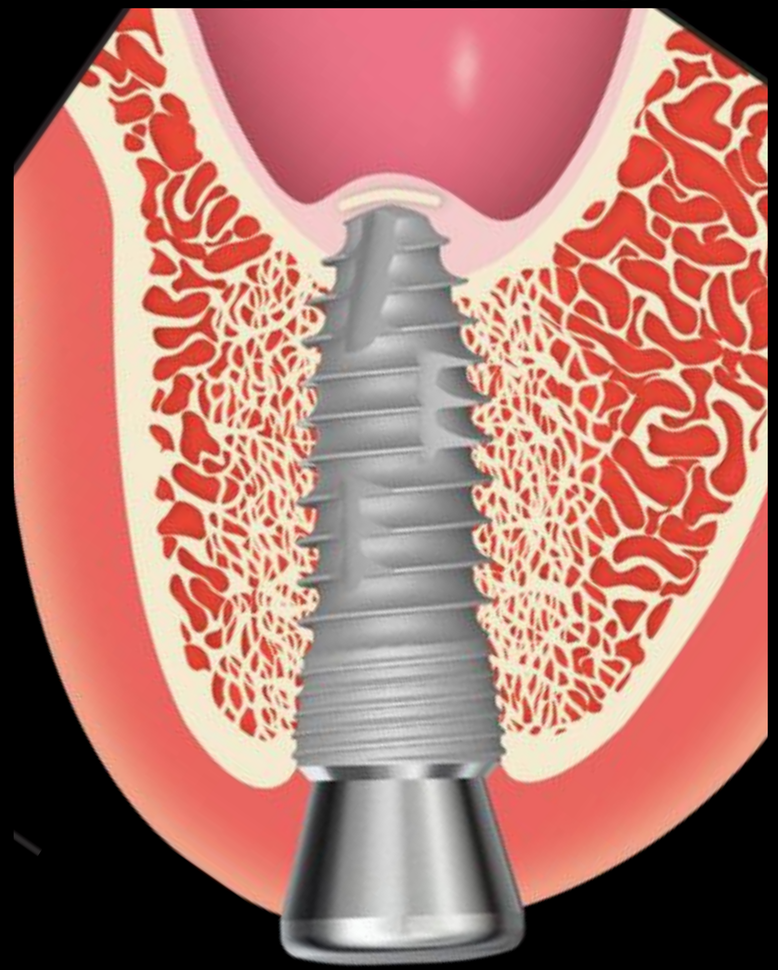


Apical Fixation

Middle Fixation

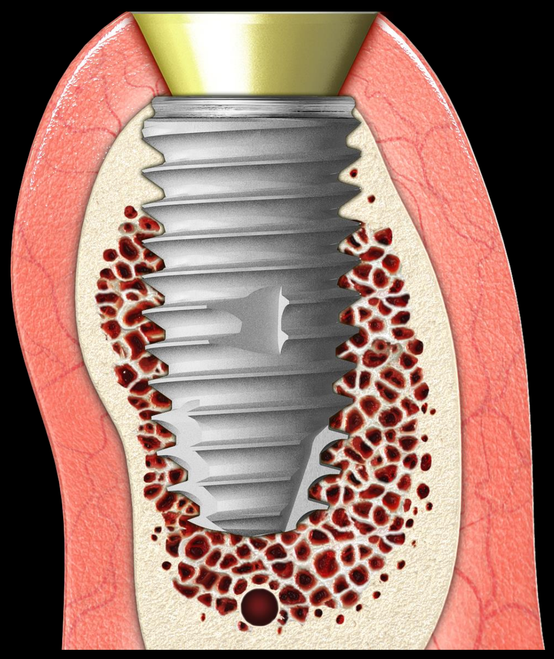
Coronal Fixation

Inferior Cortical Bone of the Sinus

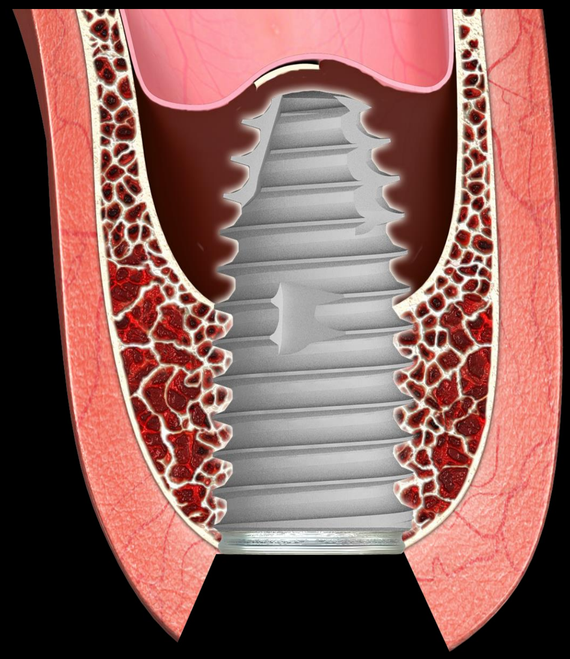


GAO 'CMI' fixation Concept

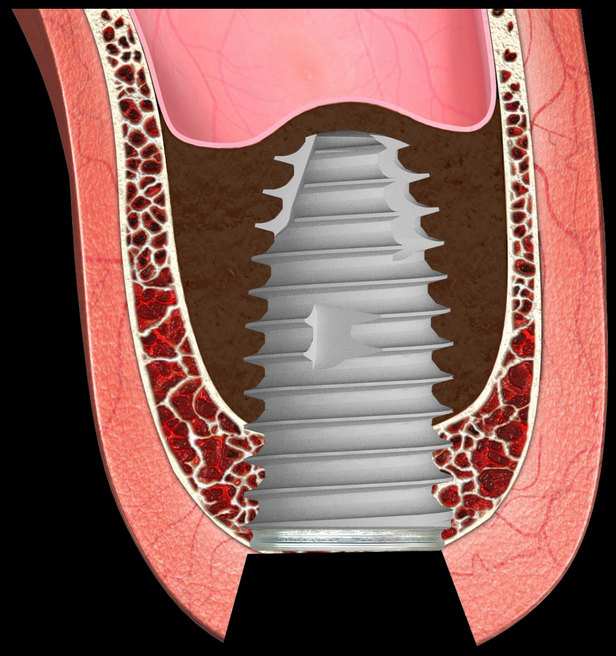
'CMI' fixation



'CM' fixation

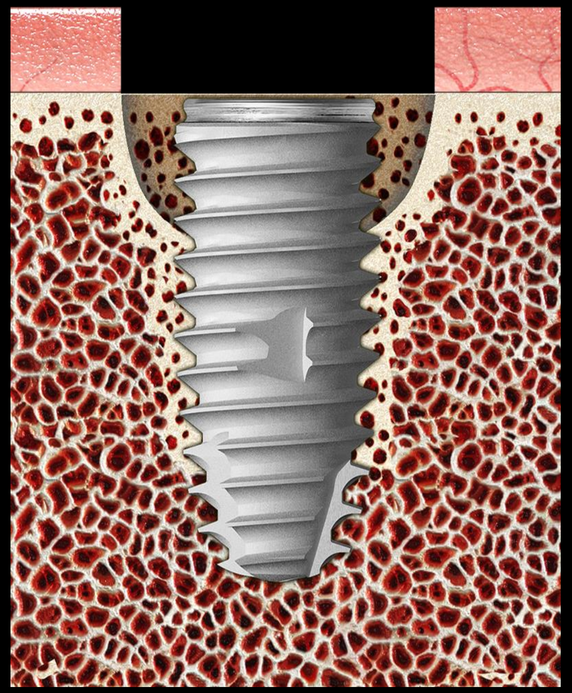


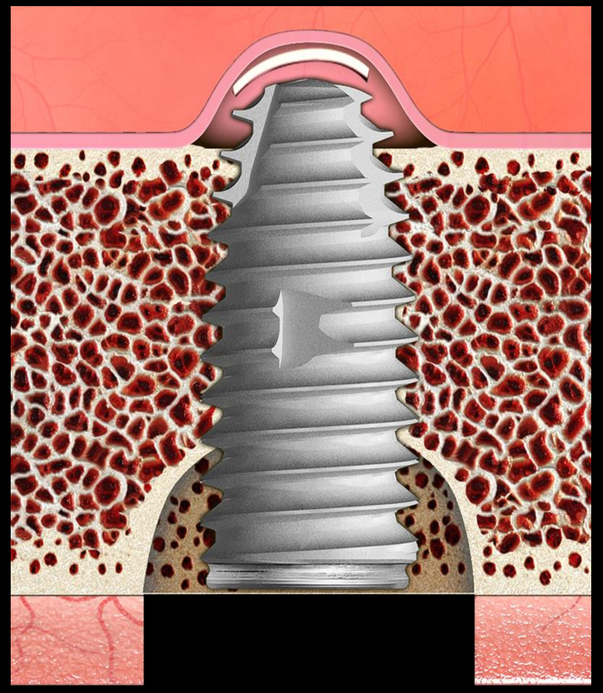
'C' fixation

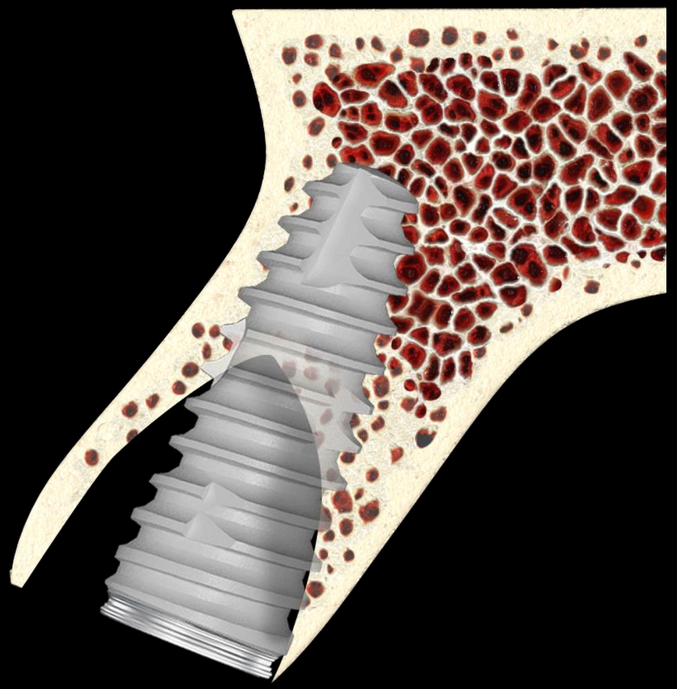


GAO 'CMI' fixation Concept

'MI' fixation

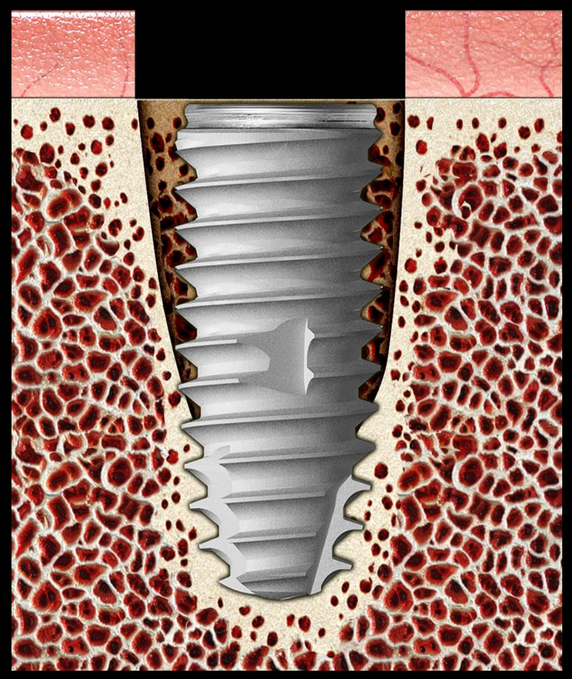


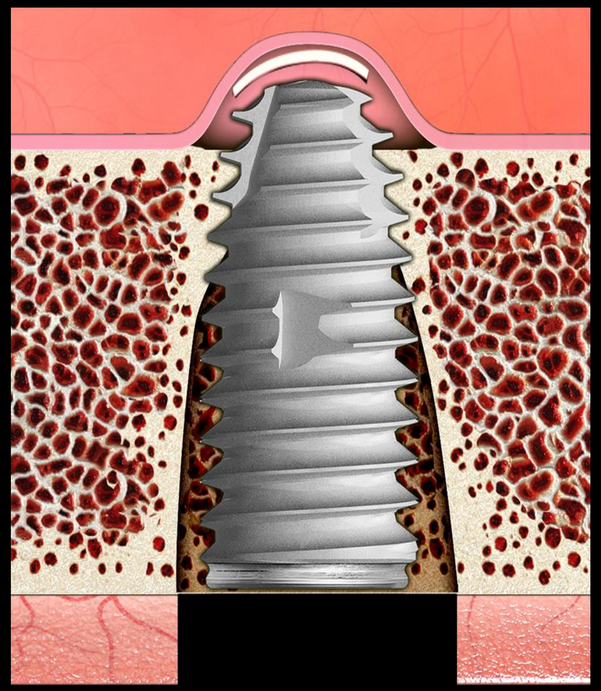


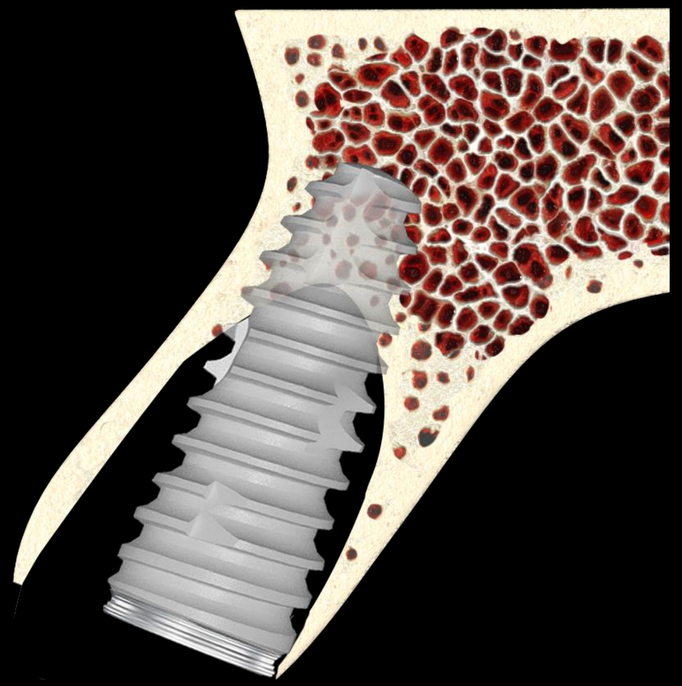


GAO 'CMI' fixation Concept

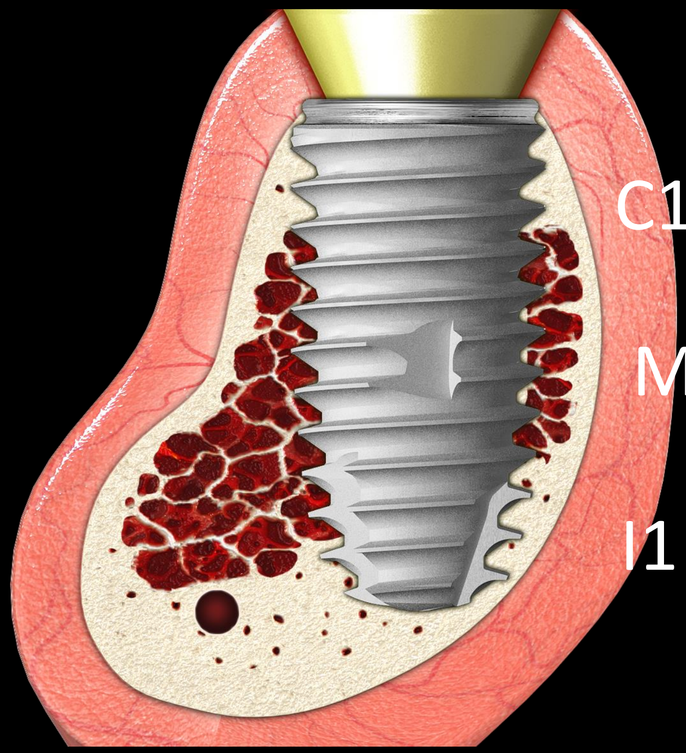
'I' fixation







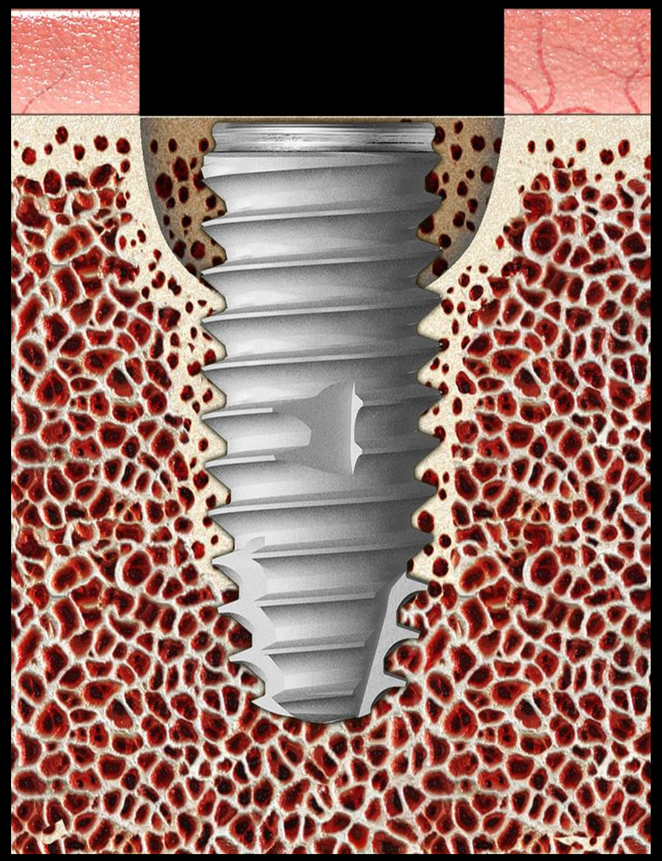
GAO Charting Method



$C_1M_4I_1$ with 40Ncm / ISQ 87

= D141 with 40Ncm / ISQ 87

GAO Charting Method



= D023 with 35Ncm / ISQ 75

2010

2017

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Jung-Chul Park

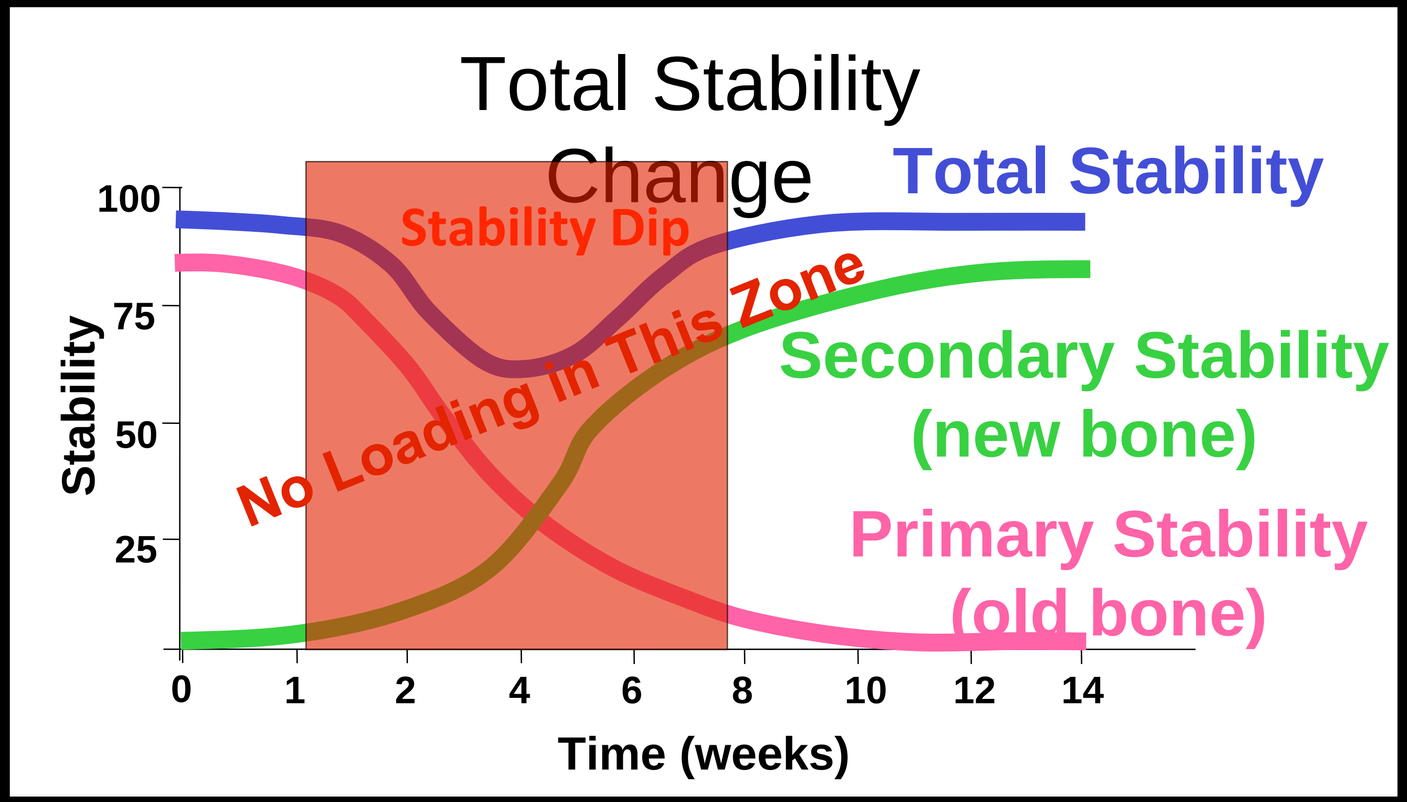
Nam Yoon Michael Kim

Jongyub Kim

Chonghwa Kim

Joongmin Kim

Why does the primary stability decrease?



- Bone trauma during drilling/implant placement might cause bone resorption.
- Bone trauma by overheat, over compression, and/or overload.

Traumaless Drilling

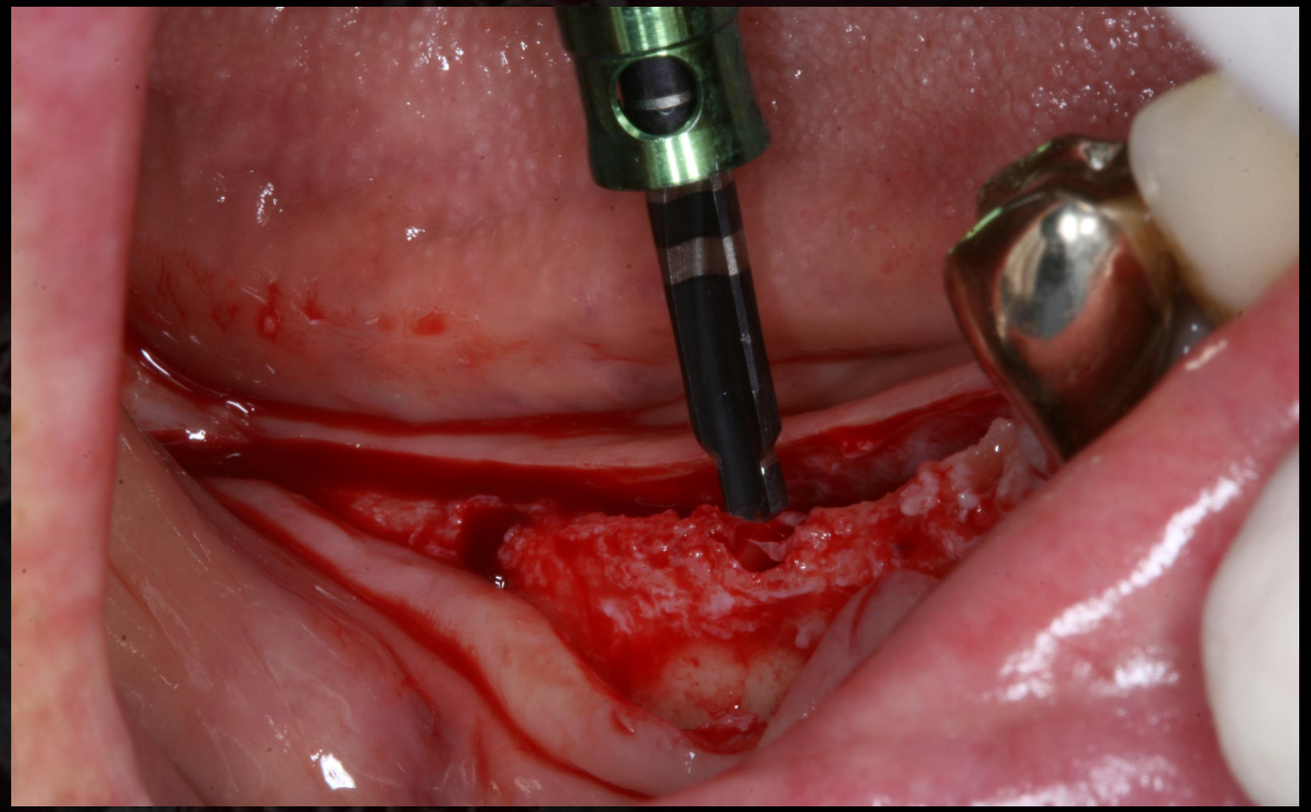
No heating

- use sharp drill

- gentle drilling

- cool water irrigation

- up & down drilling



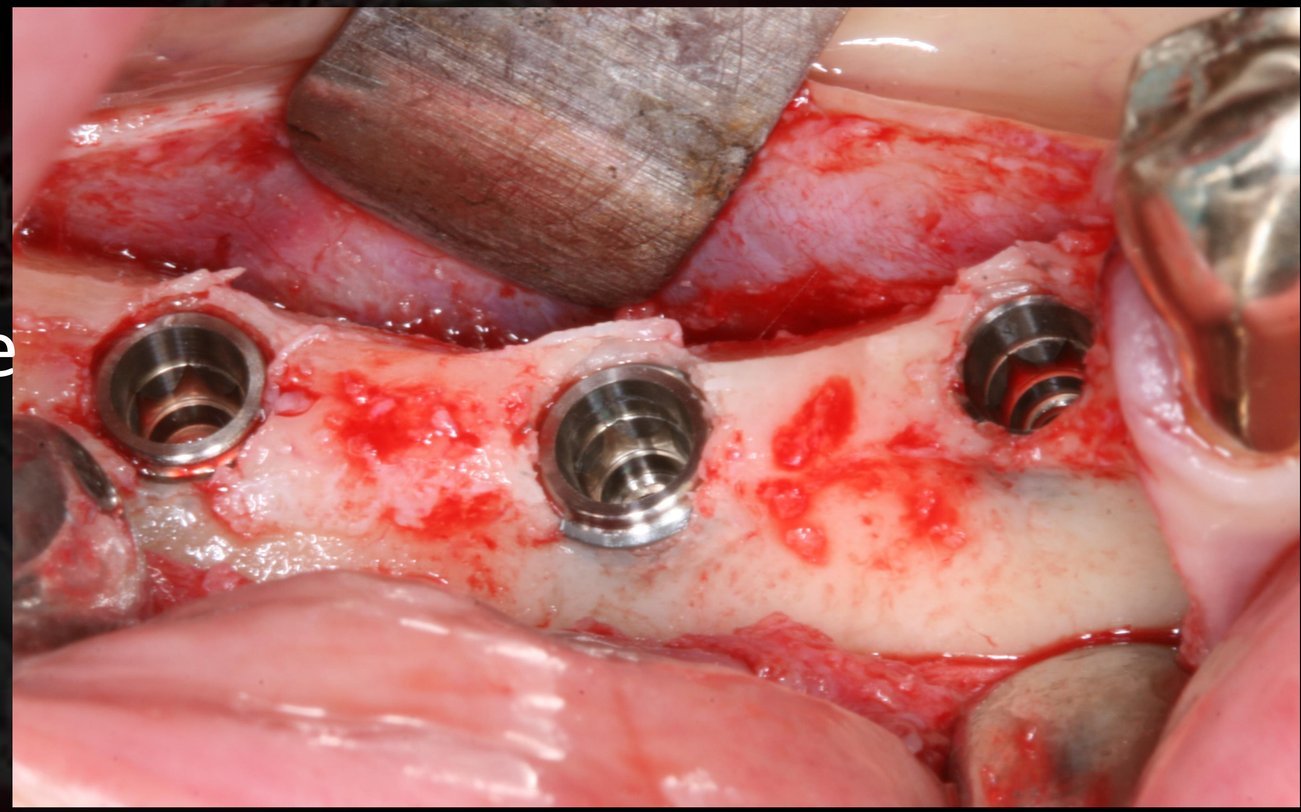
Traumaless Surgery

No heating

Physiologic pressure

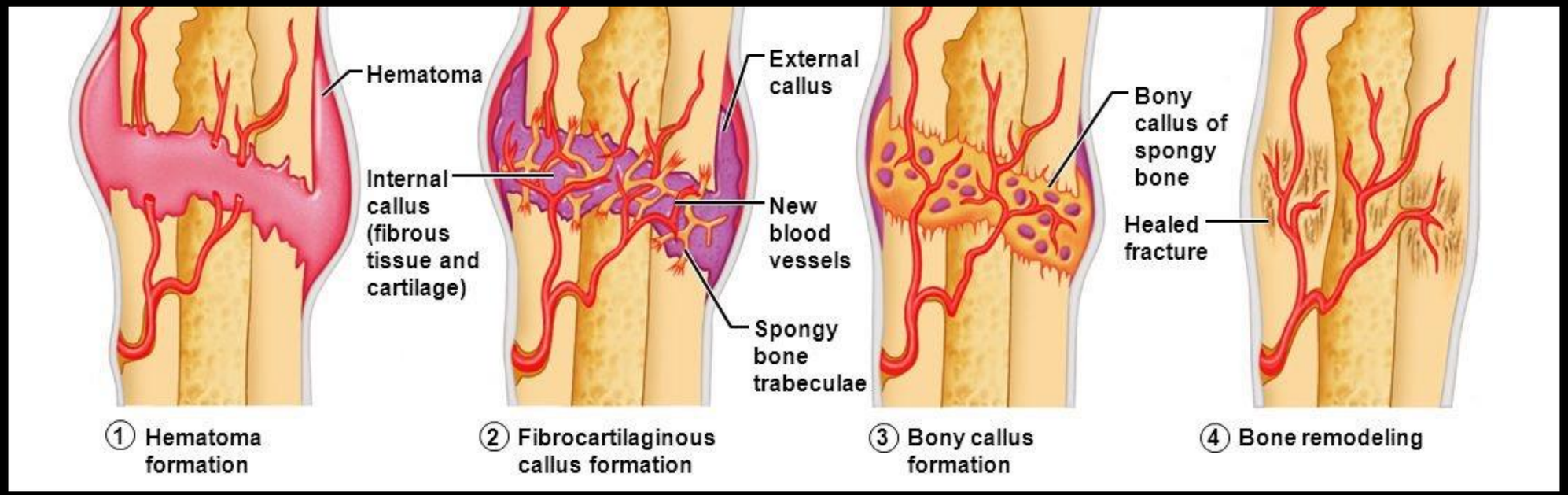
- Passive or stimulating pressure
- Avoid excessive pressure
- Undersize drilling/Self-tapping

  only in D333-D444



Think Biology!!

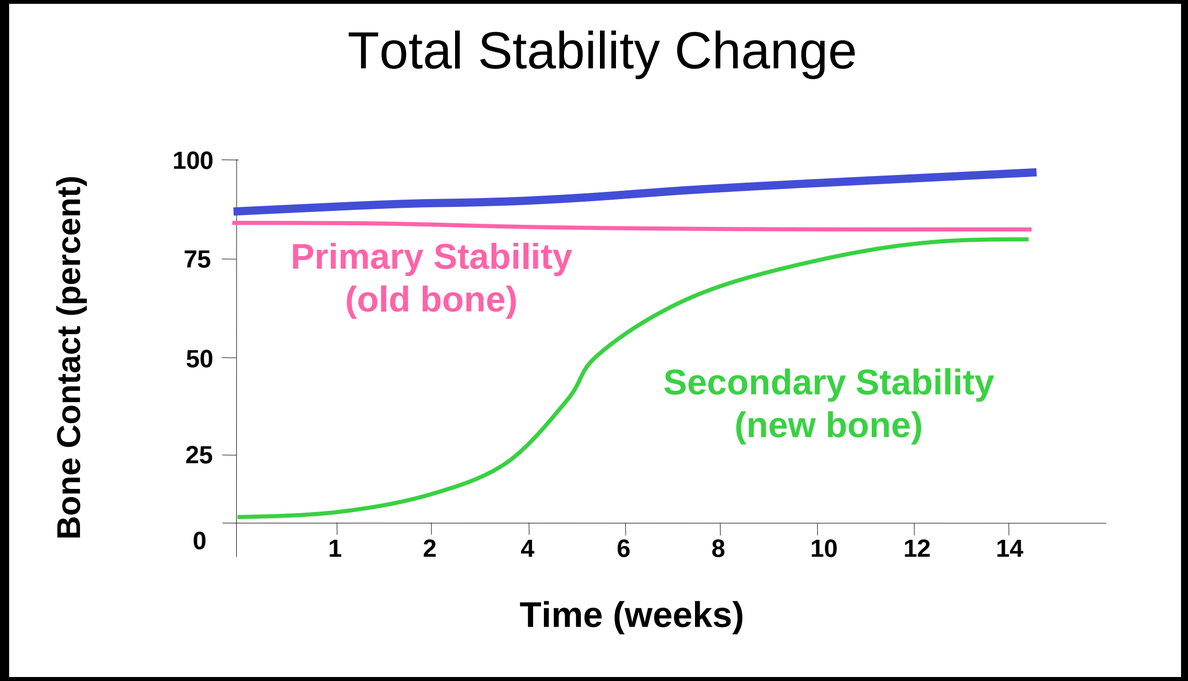
If there is no compression/ no overheating/ no movement during drilling, implant placement and healing time, the bone healing around the implant may follow the healing process of fractured bone, which may involve only bone deposition process, not bone resorption process.



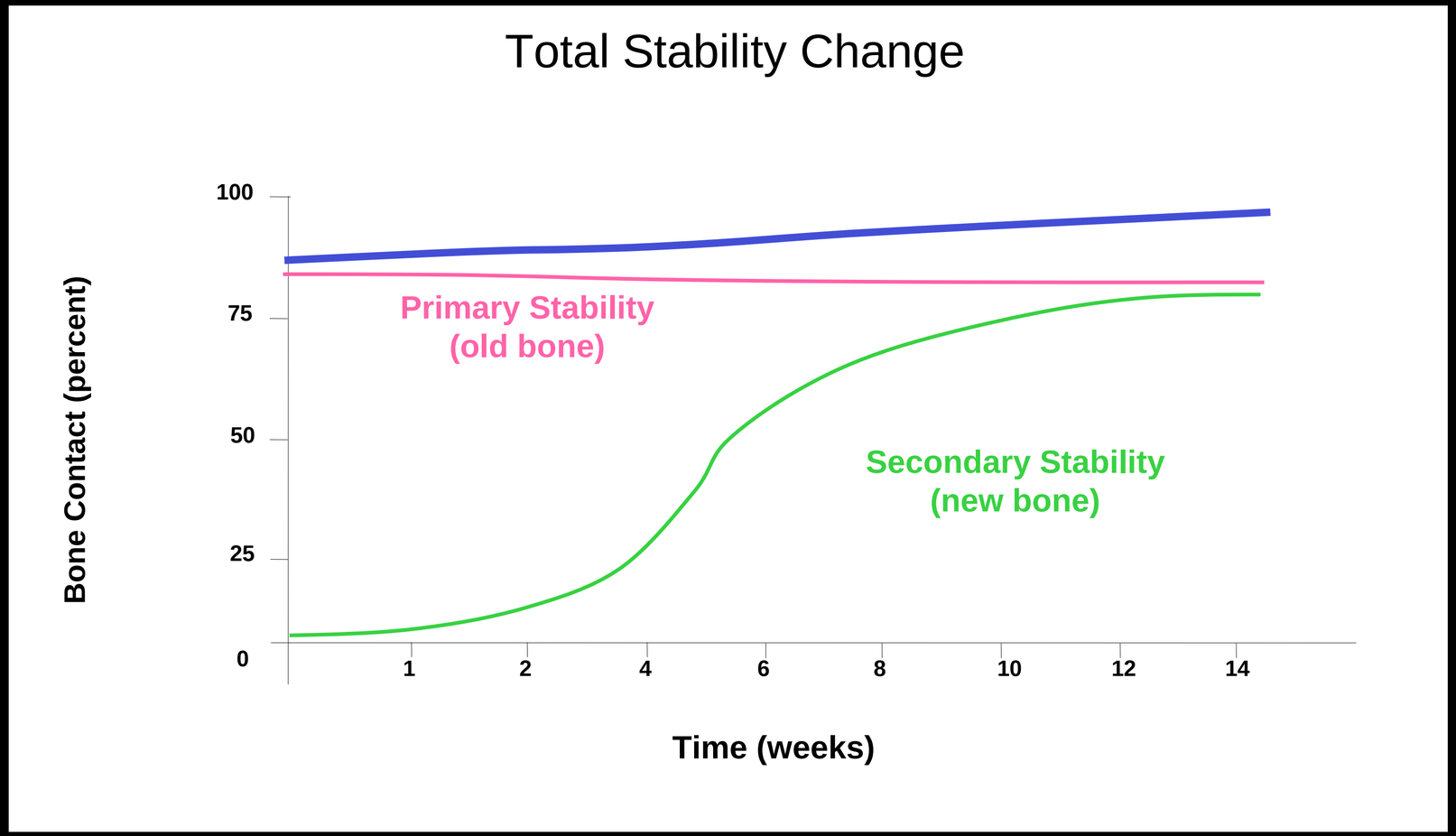
GAO Theory: No stability Dip

Think Biology!!

In case of no bone resorption around the implant, there will be no stability dip.



How to get ideal CMI fixation without the stability dip?



GAO Drilling Protocol for Ideal CMI fixation/ No stability dip

For Soft Bone(D444, 344)

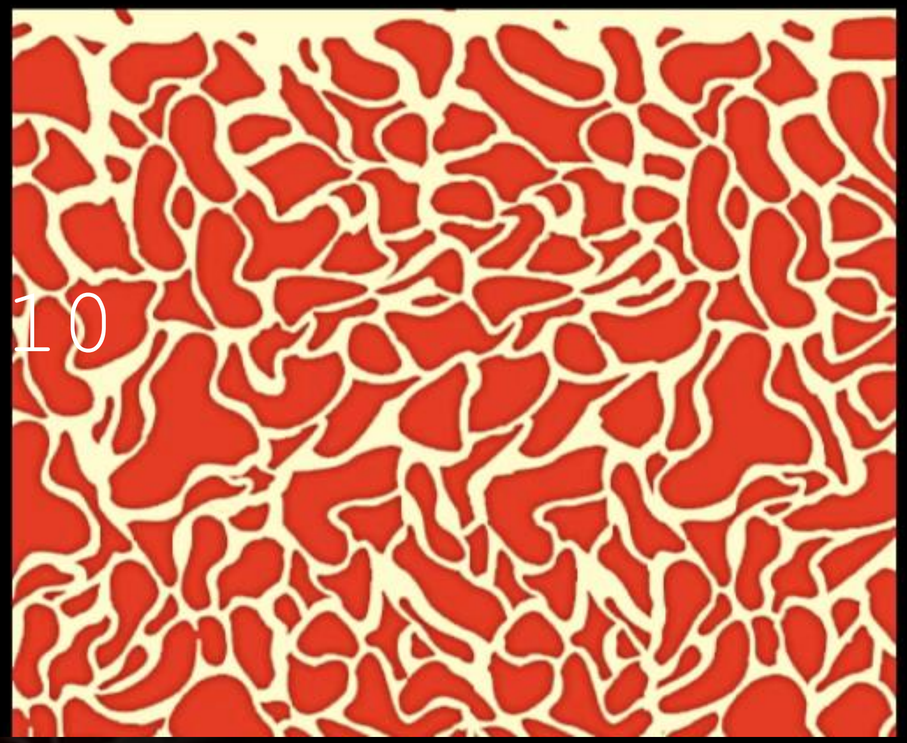
Active Placement by

Self-tapping with/without

Undersized Drilling

for maximum CMI Fixation

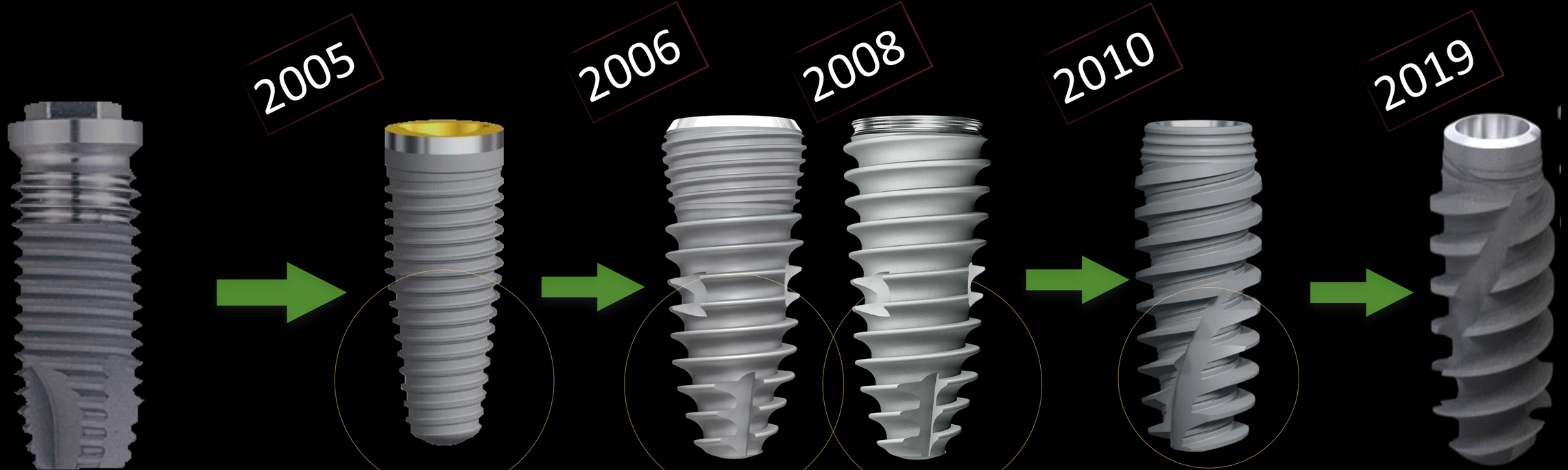
D4 44



CMI implants
have been designed for
Best Initial Stability and
Immediate/Early Loading.

CMI
ISII active

Why Tapered Apex?



Straight Implants

Nobel Replace

Neo CMI Active

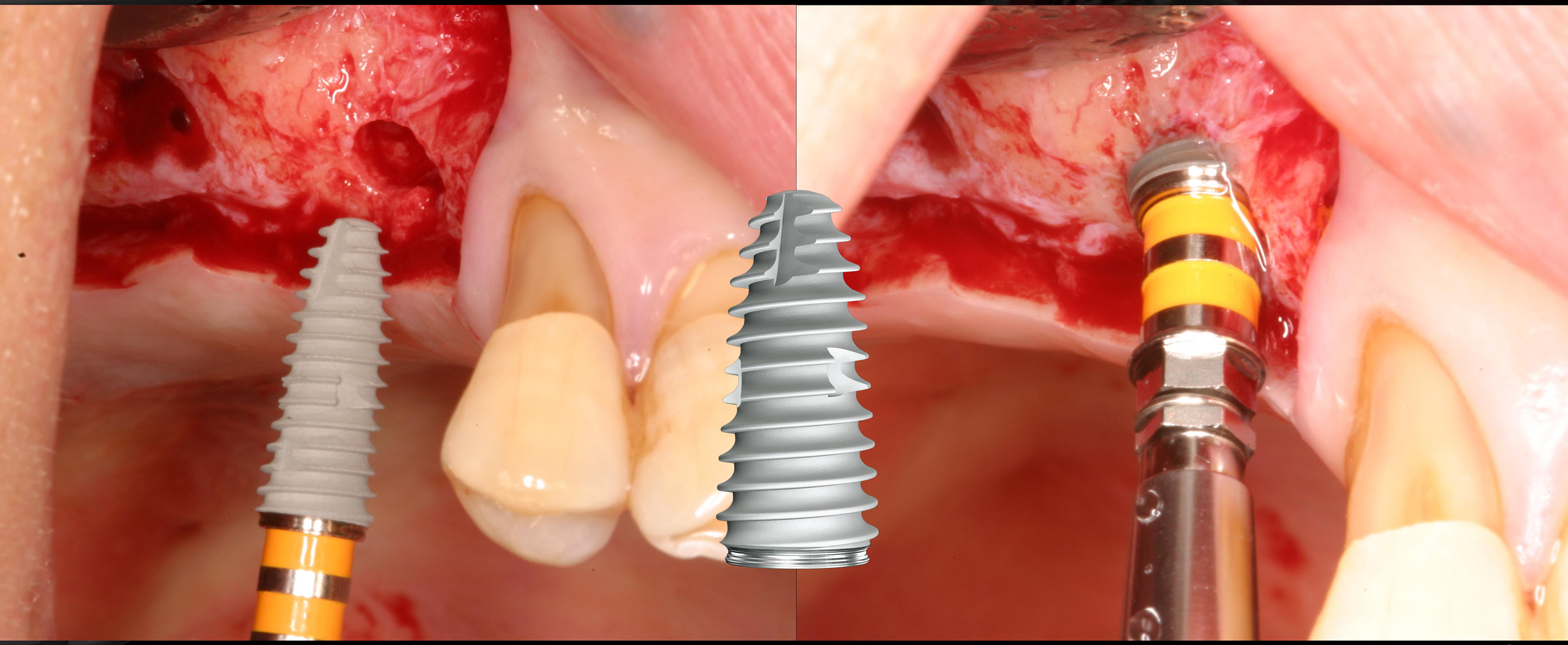
Nobel Active

Straumman BLX

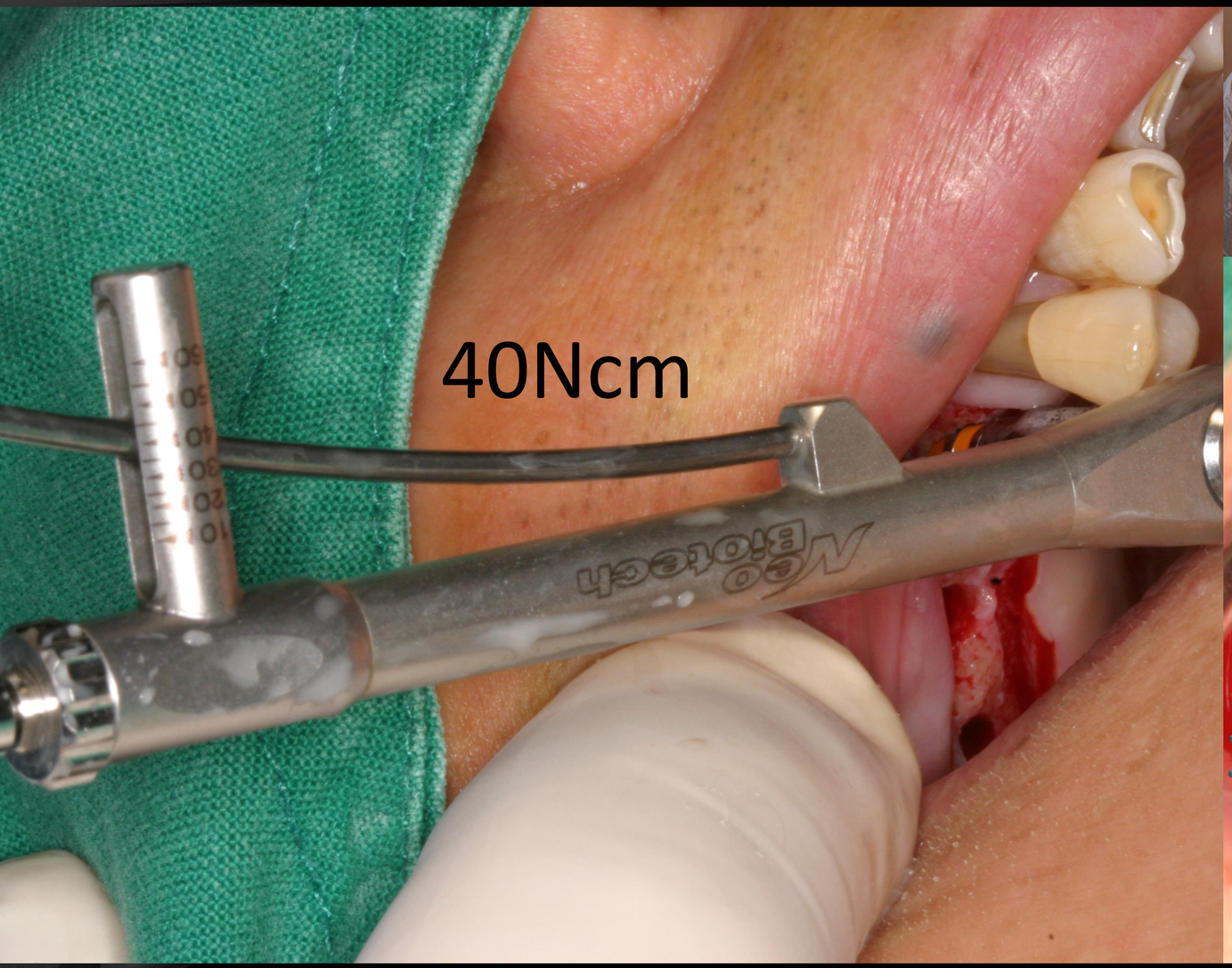
Characteristics of CMI Implant

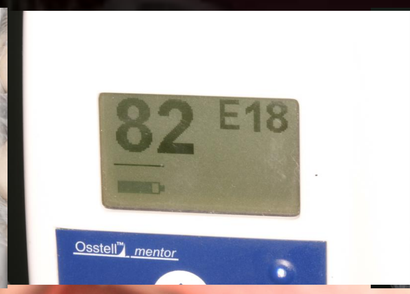
- Narrow Tapered Apex
- Optimized threads
- Bioseal
- 3 connections

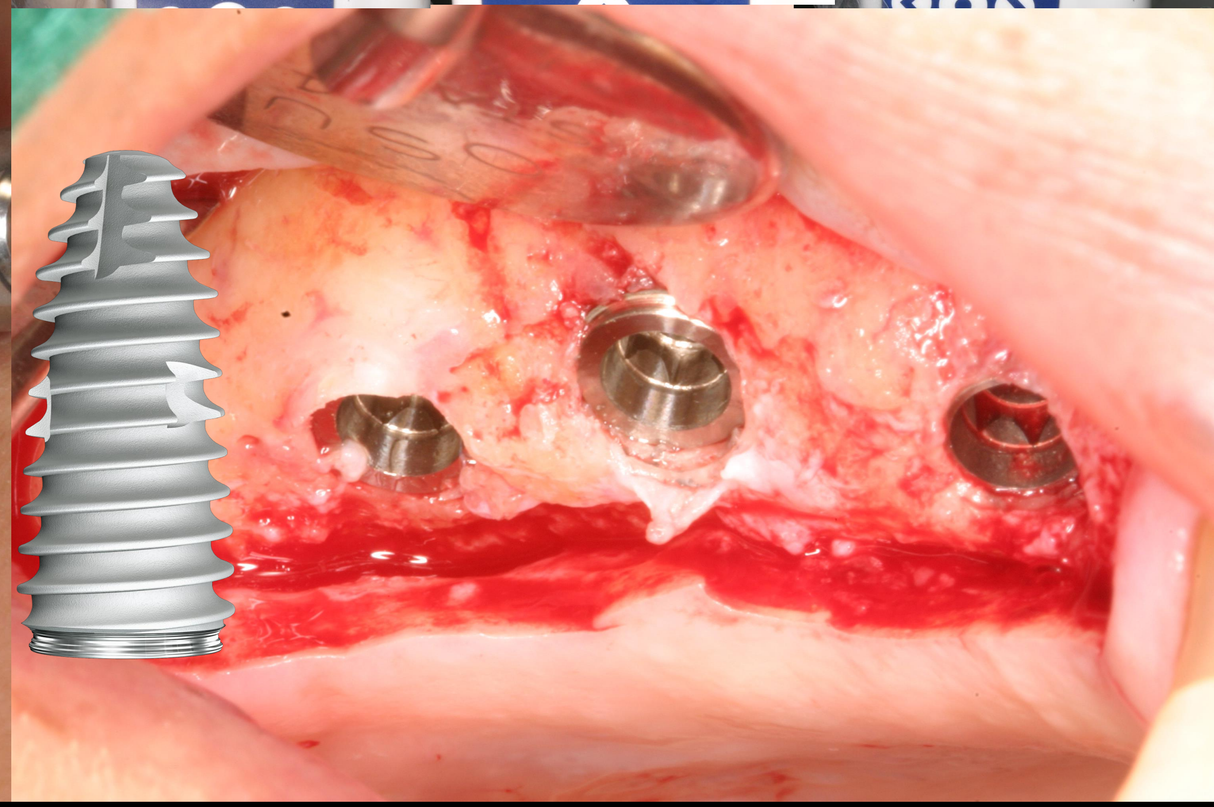
Undersized drilling and self-tapping



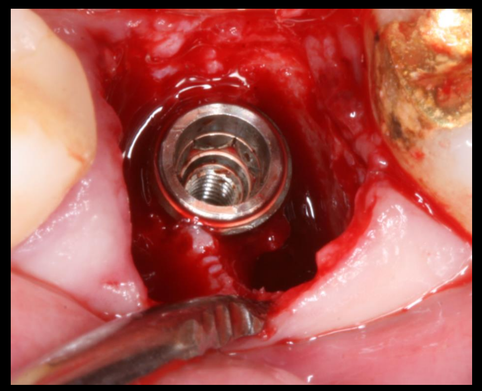
Best fixation and never spin itself

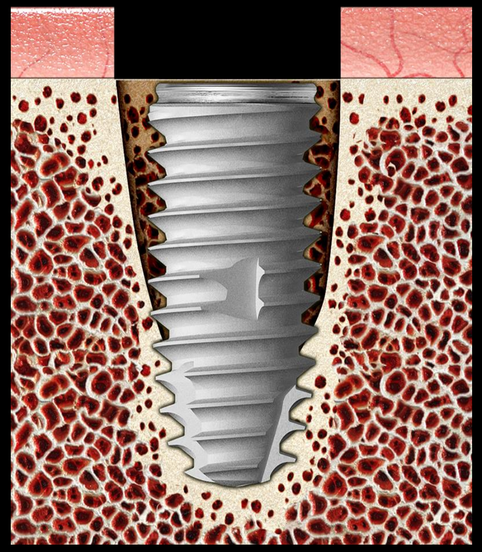


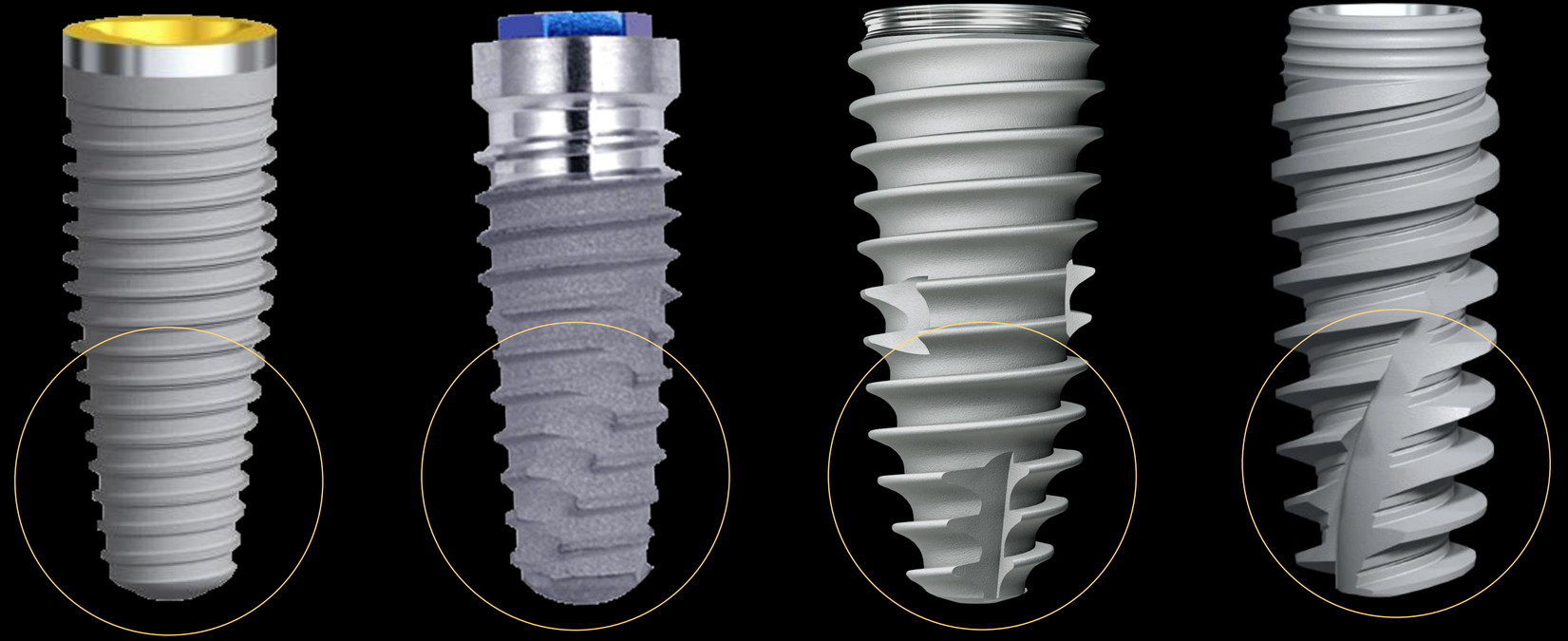




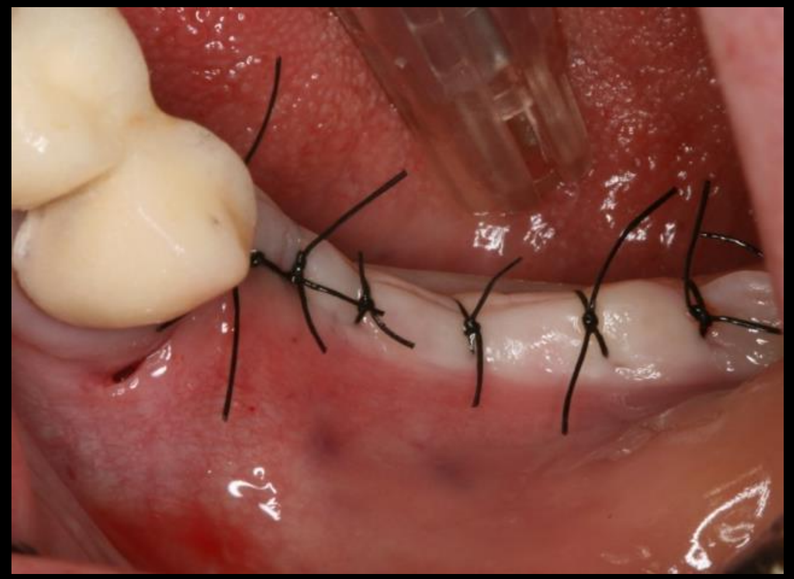
Which apex design is better for the Immediate placement?

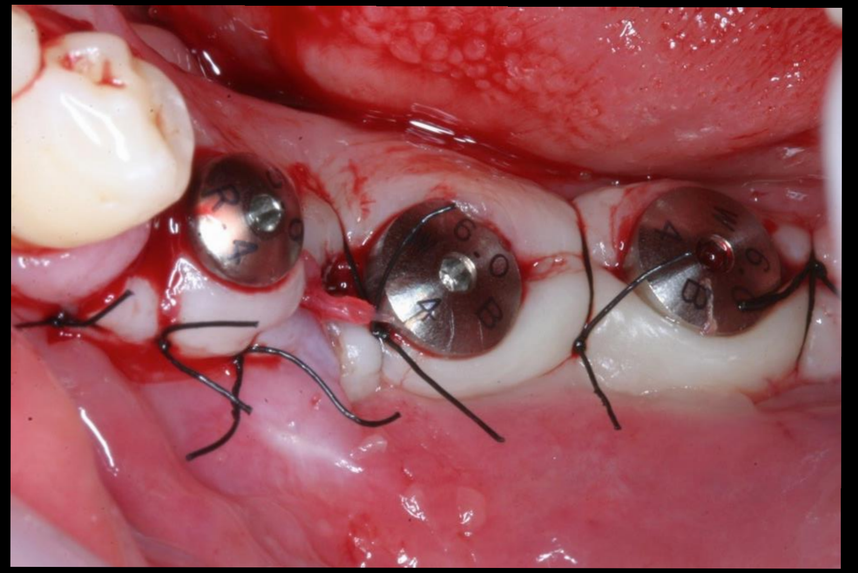




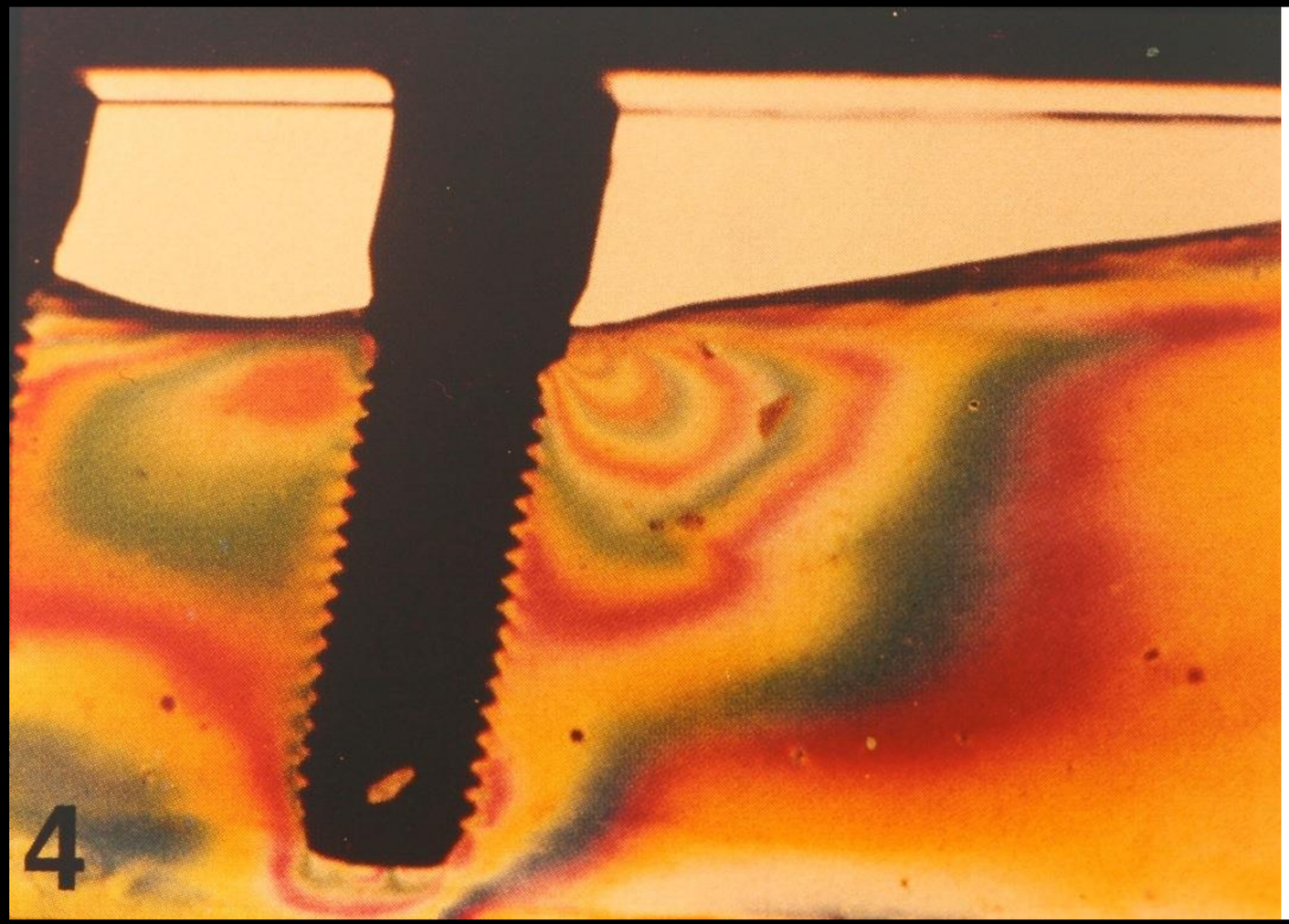


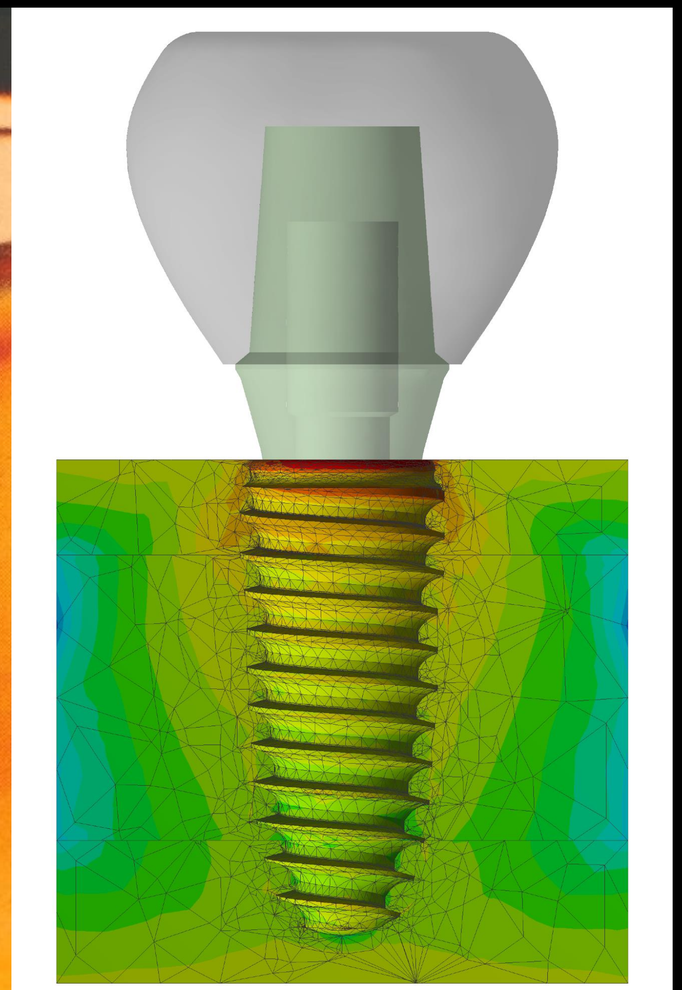
Submerged vs Nonsubmerged vs Early Loading





Most of stress is concentrated in the crestal area





How to get Ideal CMI Fixation in D144 bone?

Dilemma!!

"C" Fixation is Crucial

OverCompression causes Bone Trauma

Crestal widening

Ø3.5 Ø4.0 Ø4.5 Ø5.0 Ø5.5

Cortical Drills

Countersink

Crestal Widening
(Countersink)

Crestal Widening

Medium BIC area
Weak to vertical/lateral forces
Thin bone left

VS

Minimal BIC area
Overload
Thin bone left

Crestal Pretapping

VS

Maximum BIC area
Strong to vertical/lateral forces
Thick bone preserved

Crestal Widening

Medium BIC area
Weak to vertical/lateral forces
Thin bone left

VS

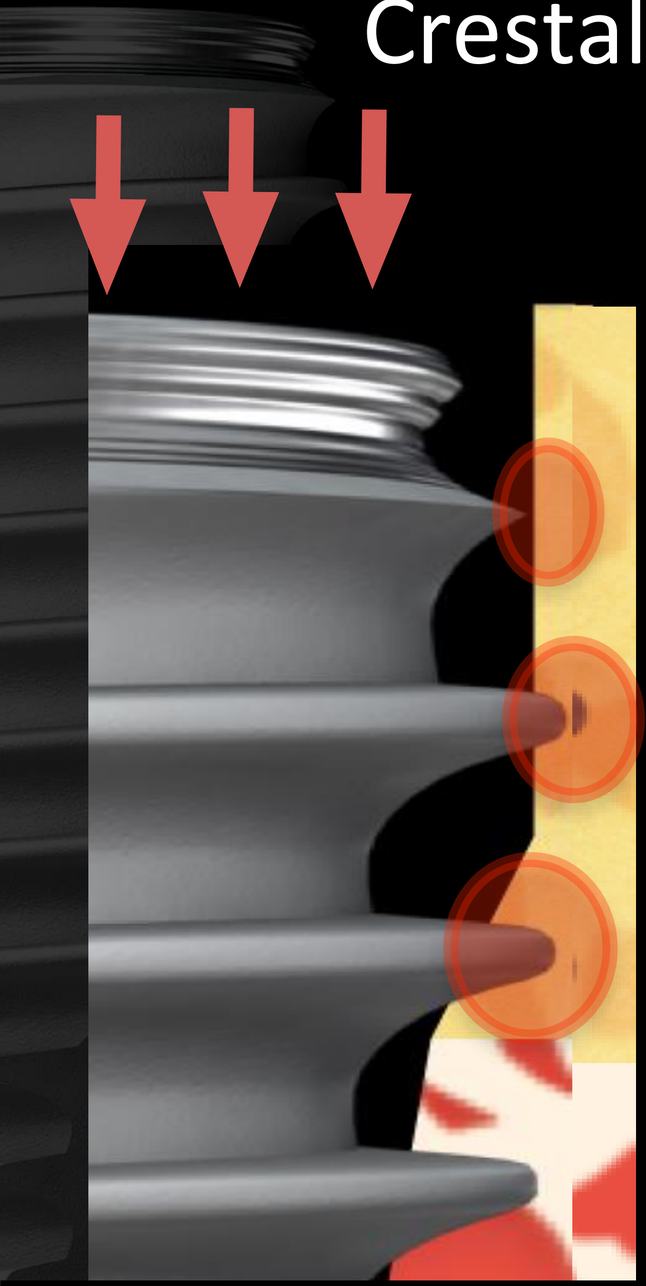
Minimal BIC area
Overload
Thin bone left

Crestal Pretapping

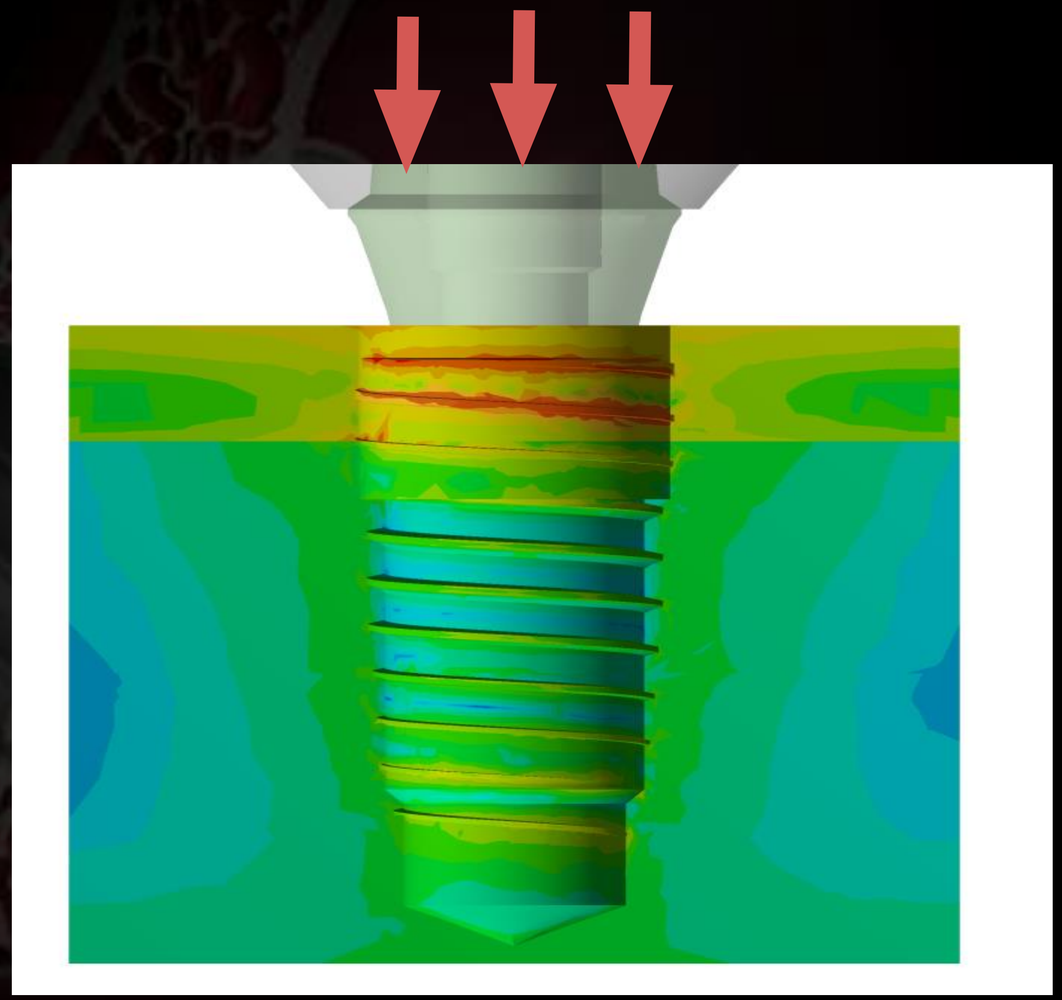
VS

Maximum BIC area
Strong to vertical/lateral forces
Thick bone preserved

Crestal Widening: Conventional Loading Concept



High possibility of rapid and large amount of osteolytic bone remodeling due to the higher stress(force/surface area) on the engaged bone surface resulting in acute decrease of stability

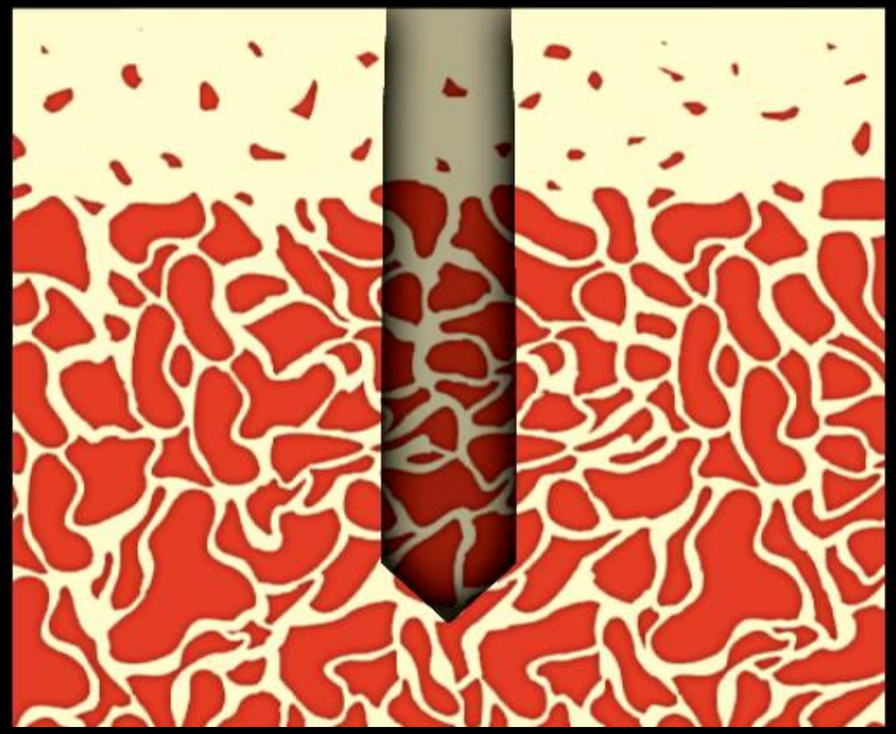


Over stress concentrated

How about Crestal Pretapping?

Twist Drill ∅ 2.9

D144



Passive Placement
by Pretapping

Active Placement
by Self-Compaction

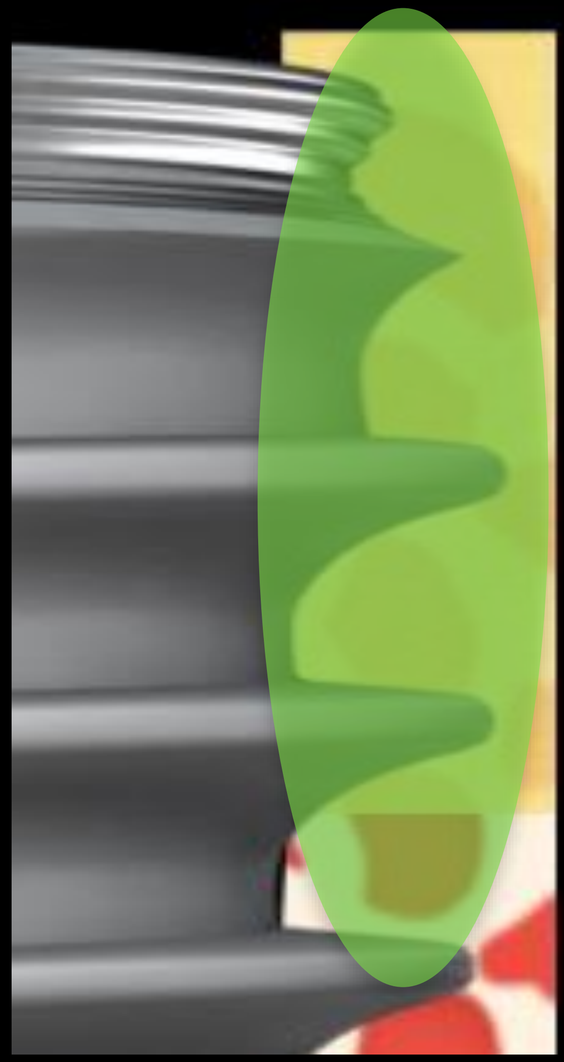
Cortical pretapping with short tap

3mm Cortical Taps

Long Tap vs Short Tap

Crestal widening vs. Crestal Pretapping

-Overstress/
-High possibility of rapid bone resorption/
-Decrease of stability

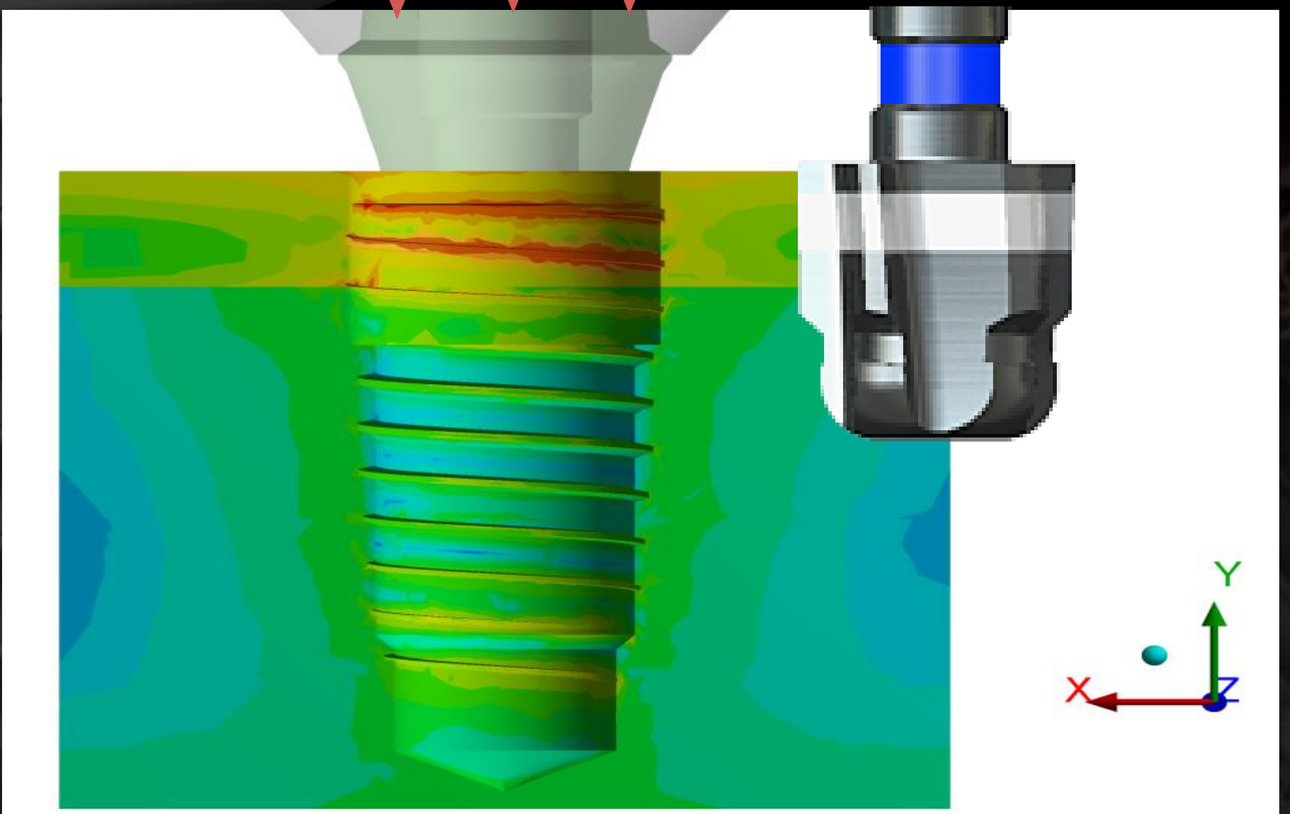


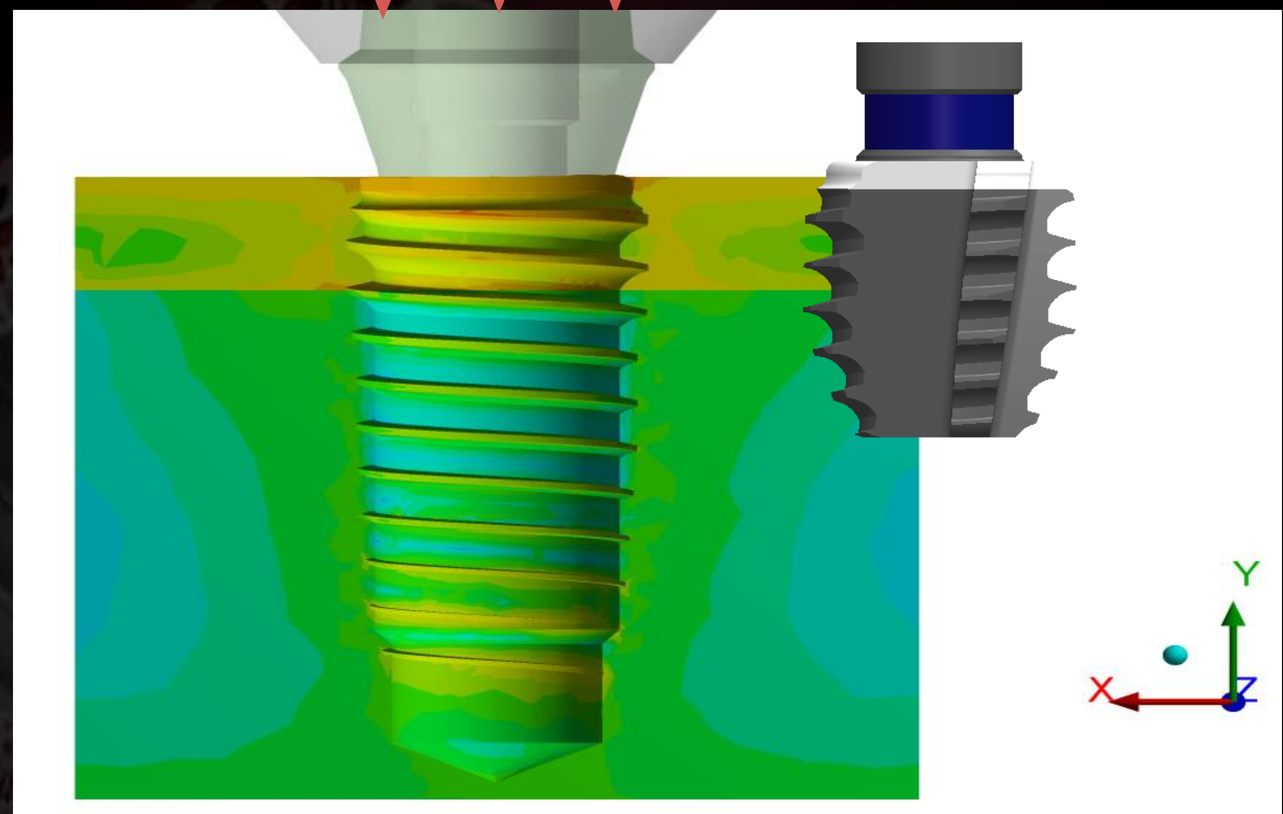
-Even Stress distribution/
-Bone formation/
-Increase of stability

Cortical widening

vs

Pretapping



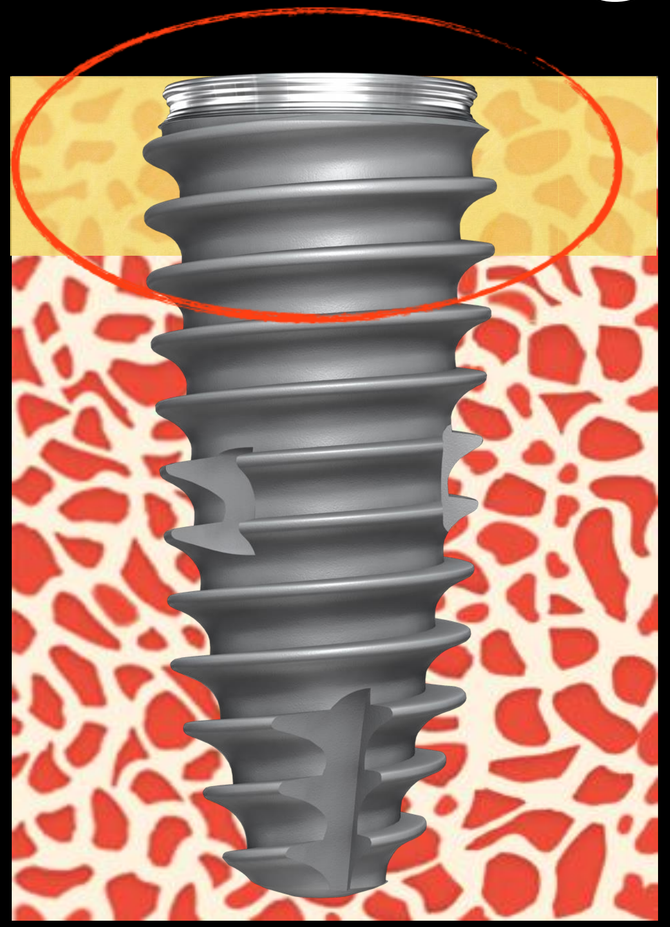


Over stress concentrated

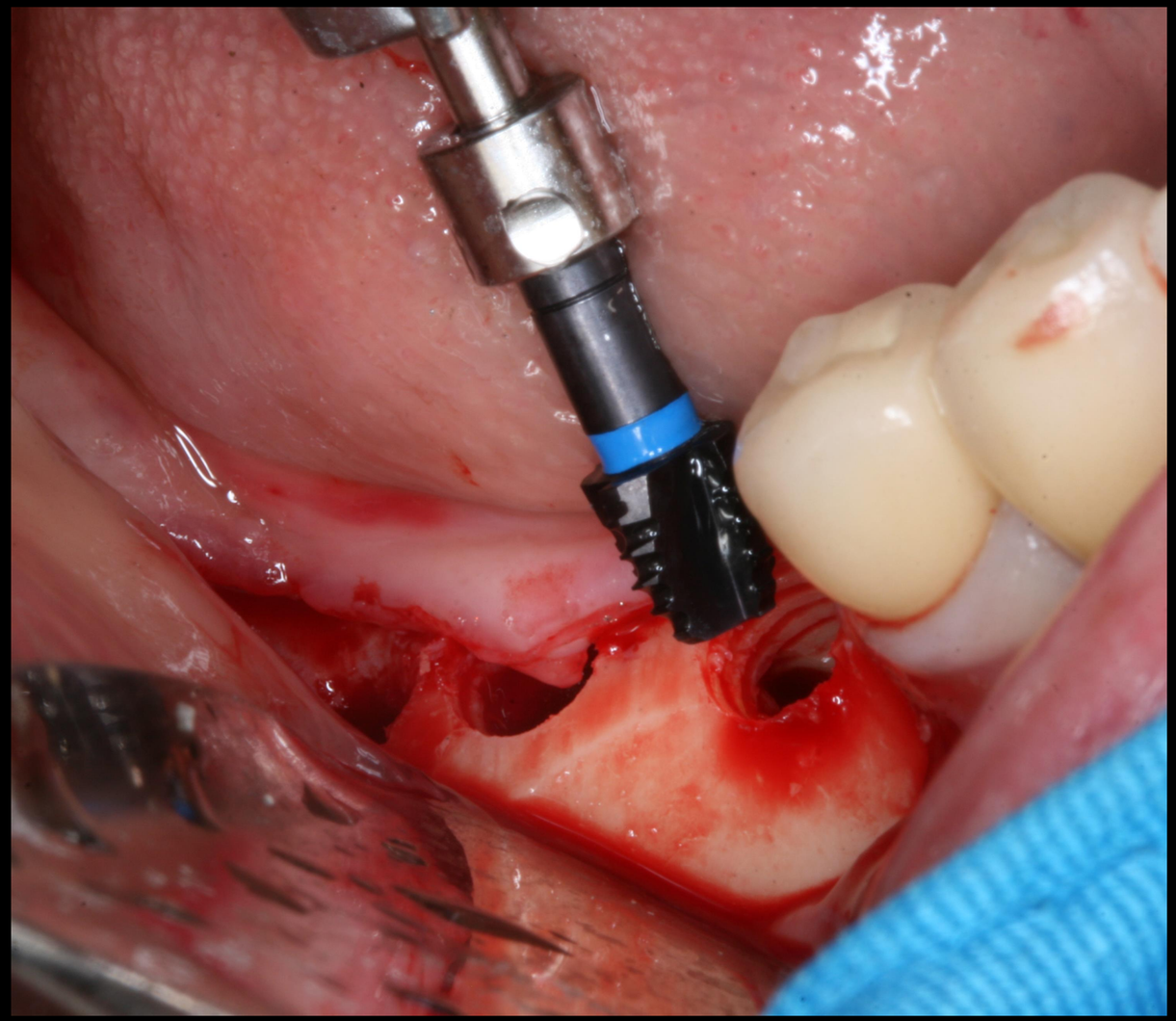
Even stress distributed

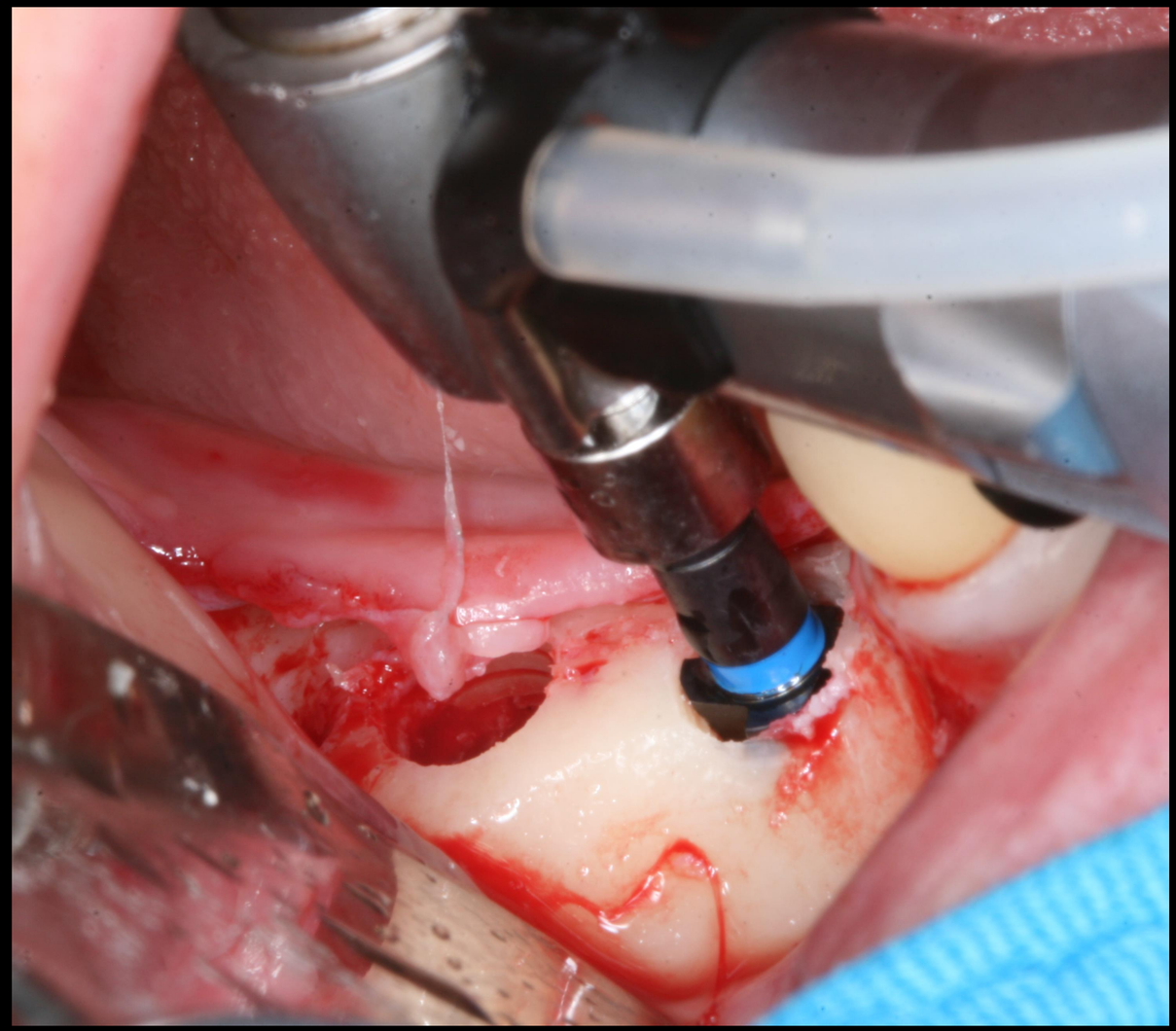
Neobiotech study 2016

This fixture is designed for



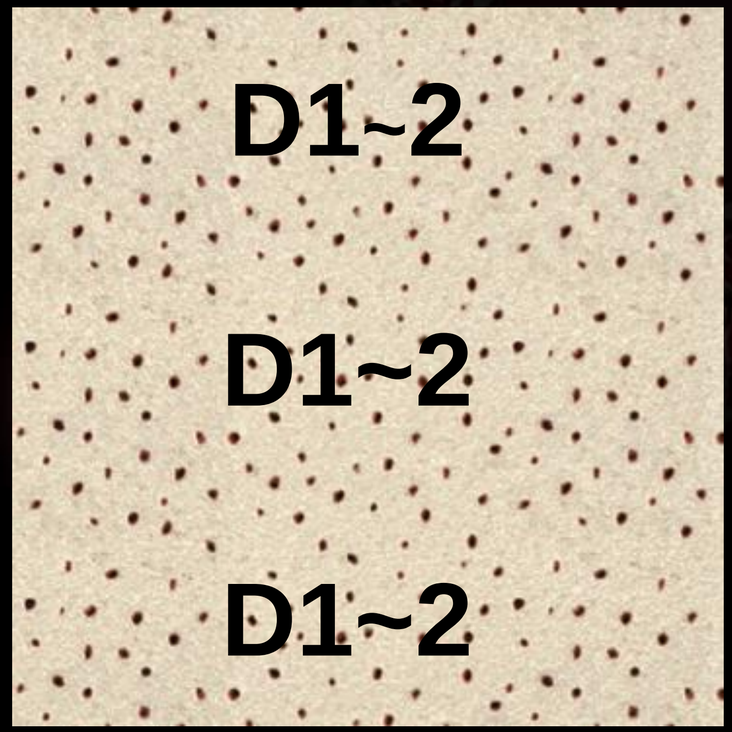
Enhancement of C Fixation in D144 Mixed Bone





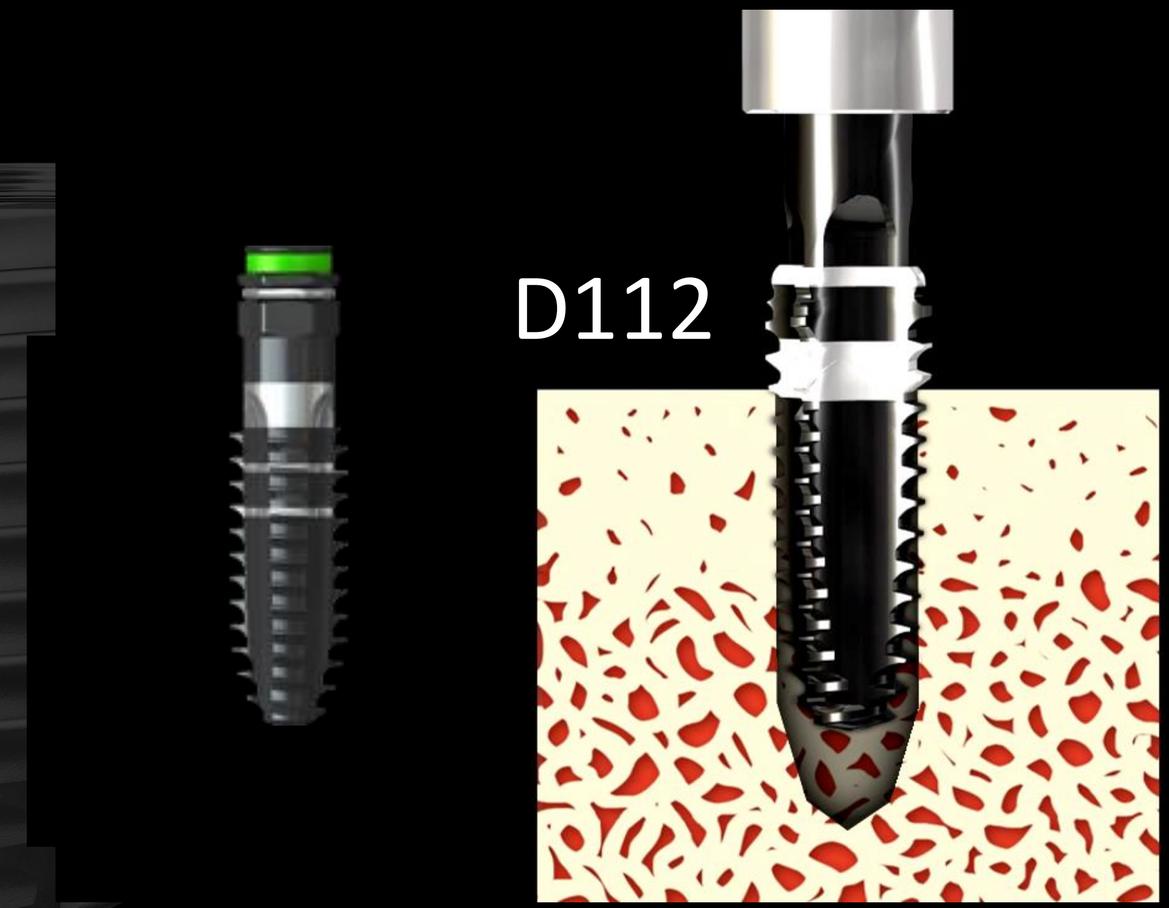
How to get Ideal CMI Fixation in D111 bone?

Full/Oversize Drilling +
Full Tap +
Cortical Short Tap



Long Tap

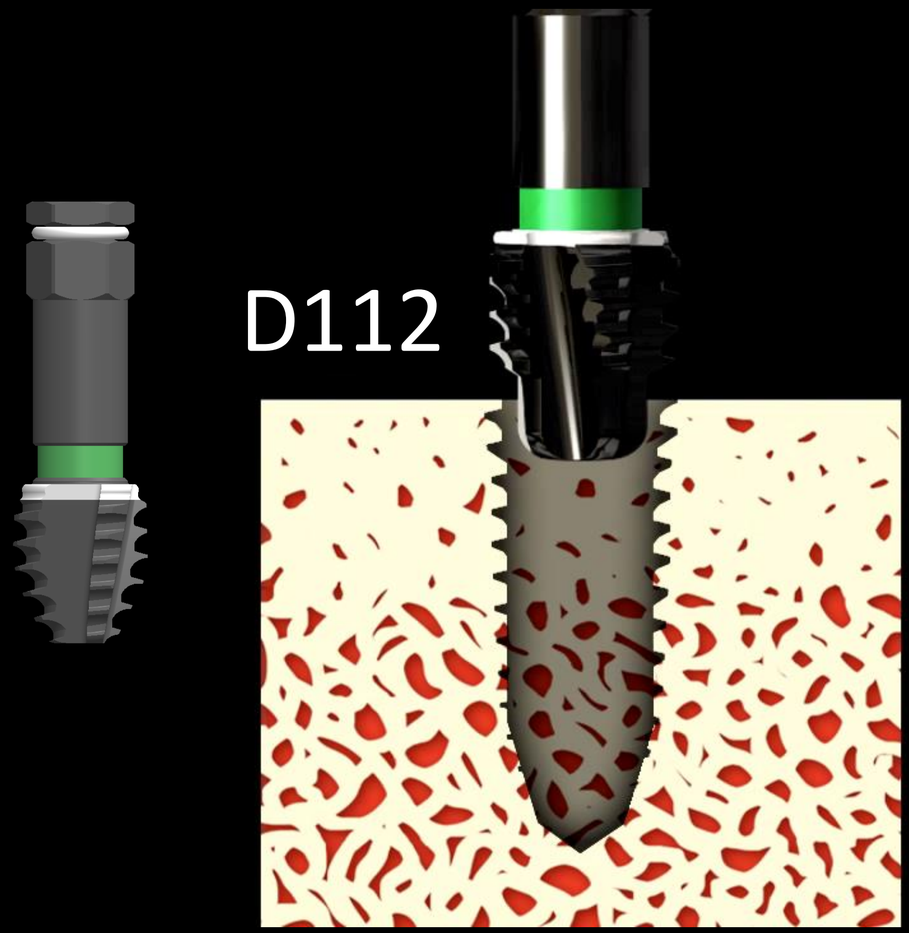
D112



Overcompression
in the crestal area

Double Tap

D112



Ideal CMI fixation
by passive fit

GAO
CMI Fixation Concept
of Implant Placement
by Prepping

An Animal Study on the Stability Change of IS II active

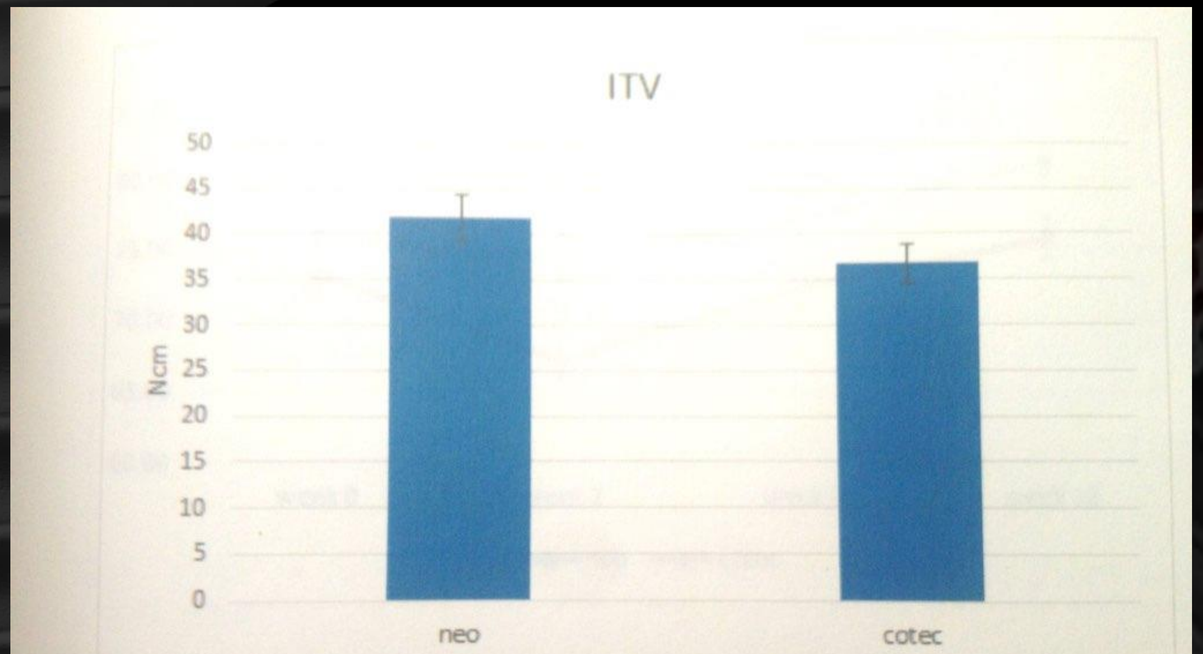


Fig.6. Graph of ITV measured immediately after implant placement.

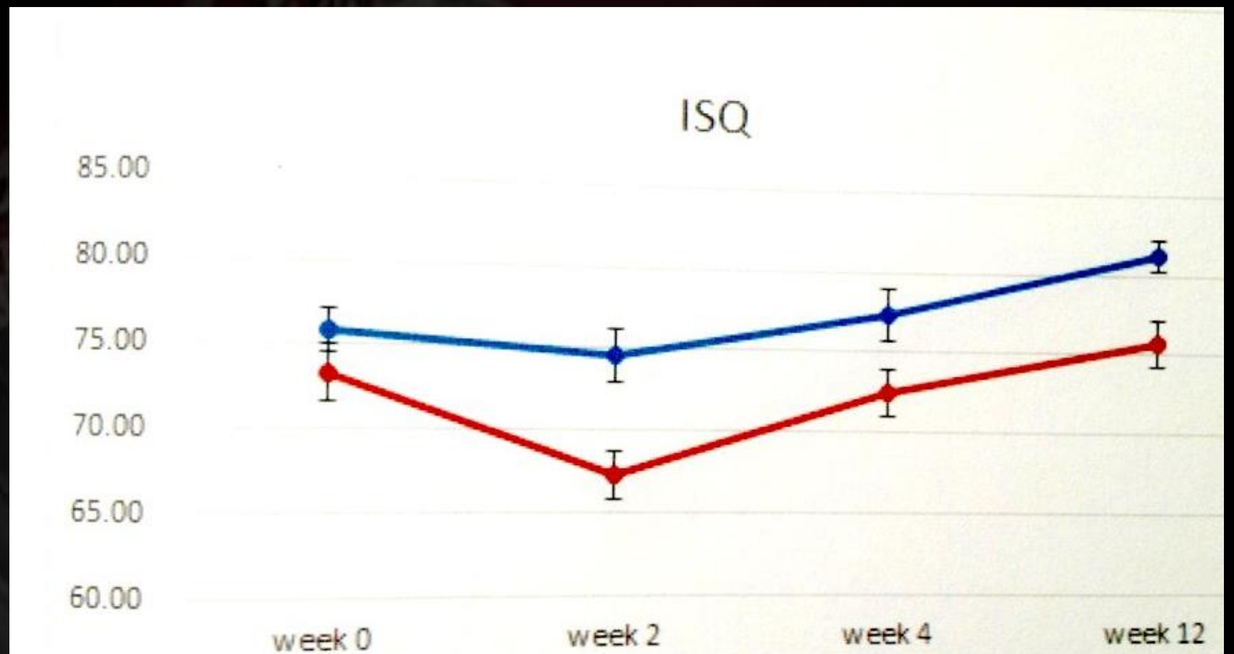
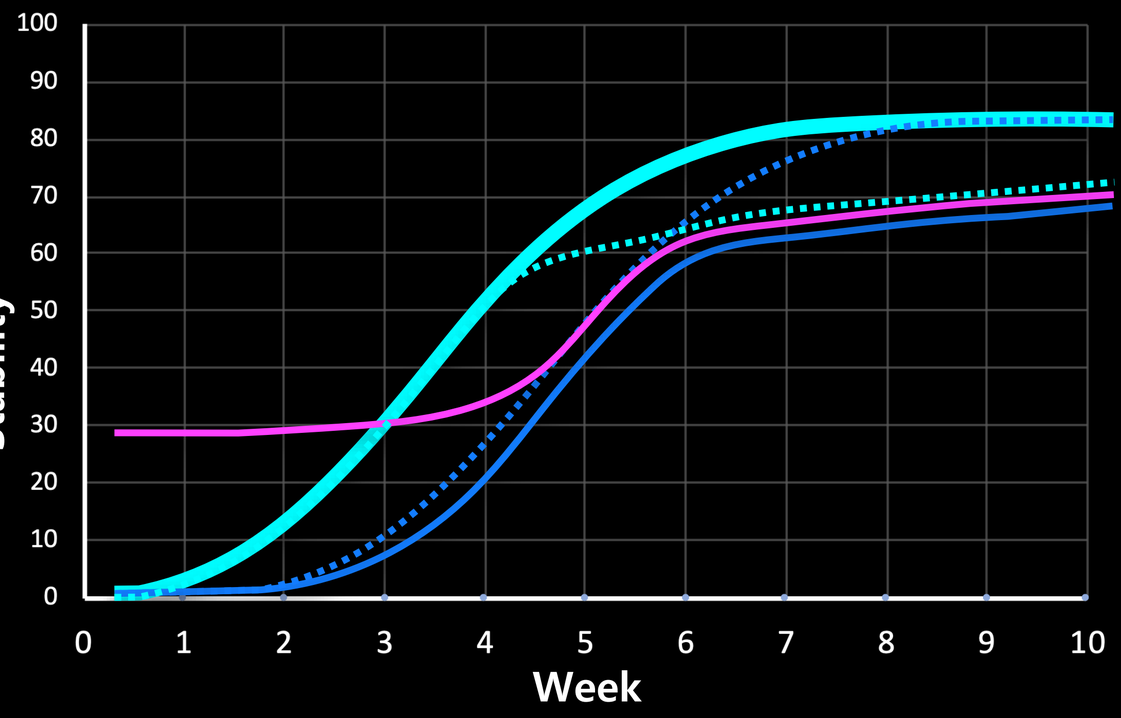


Fig.7. Graph of ISQ of placed implants by healing period.

Kim ST, Thesis, Korea University, 2013

D1D4

Paradigm Shift in Stability



K

Secondary Stability Pattern

Ossification and Maturing

lue: Conventional

lue dot: Improved Bone Implant Contact(Tap)

urple: immediate bone formation and maturing (No auma)

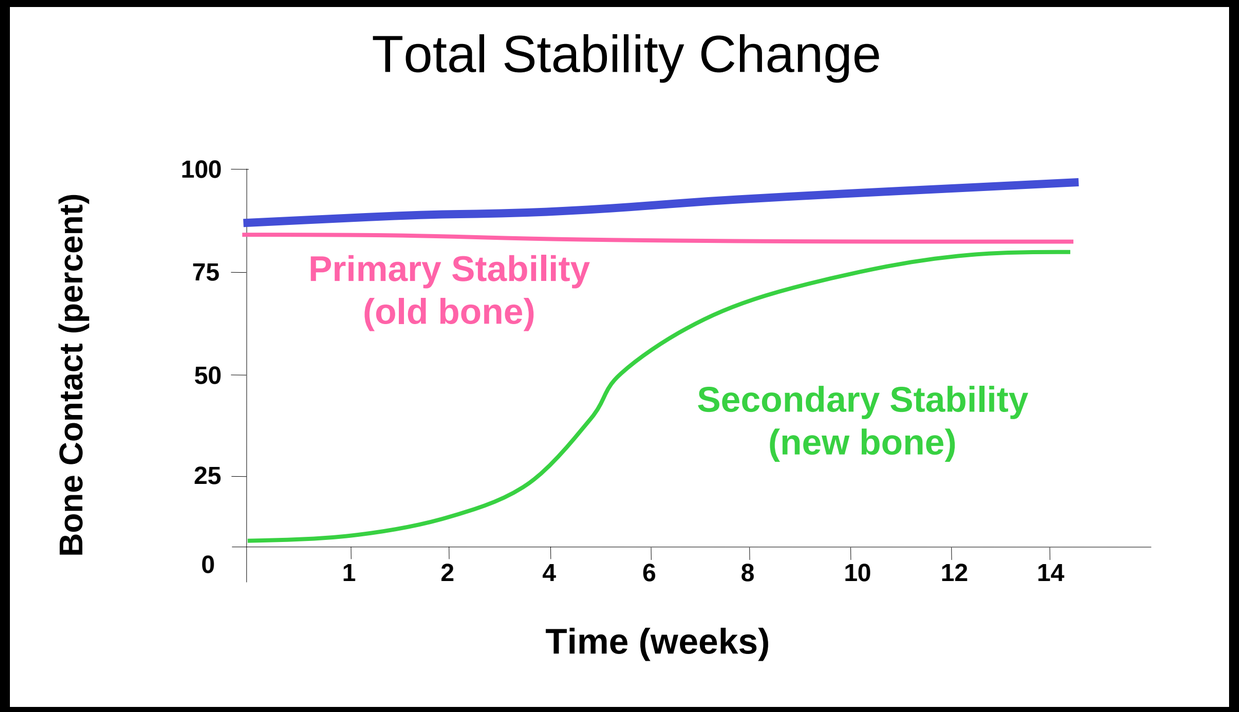
reen Dot: faster ossification by decreasing the mount of new bone formation needed

reen: Better BIC +Faster ossification

GAO Theory: No Stability Dip

If there is no bone trauma during surgery, Three will be no bone resorption,

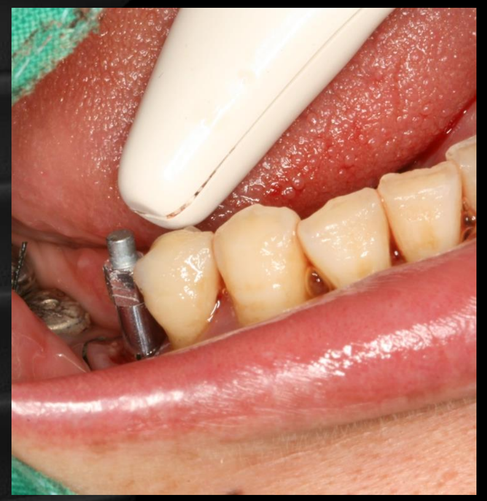
If there is no bone resorption around the implant after insertion, there will be no stability dip.

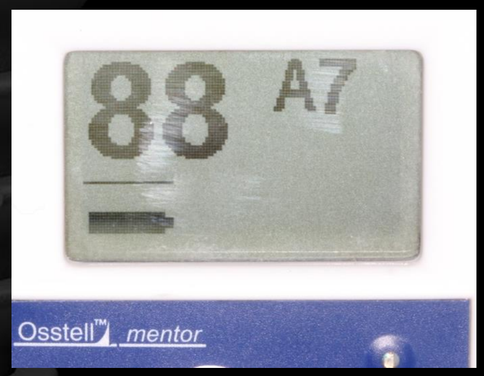


No bone trauma by

- No heating
- No destructive pressure
- Physiologic pressure only

How can we measure implant stability every 2 week during the healing period?






AnyCheck
AnyCheck
Neobiotech
iST
Neo
Biotech
AnyCheck

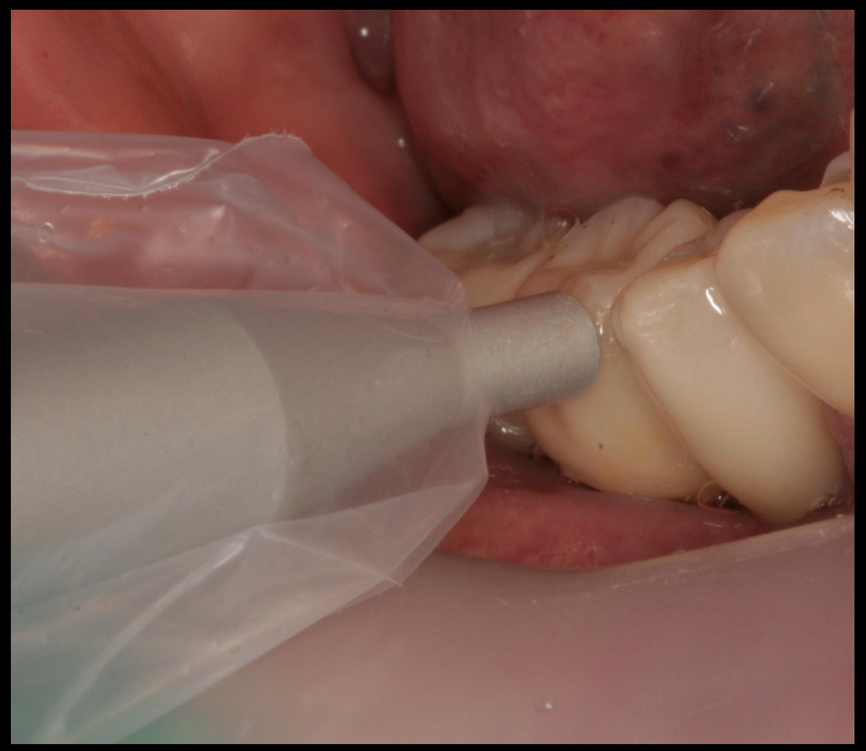
AnyCheck R

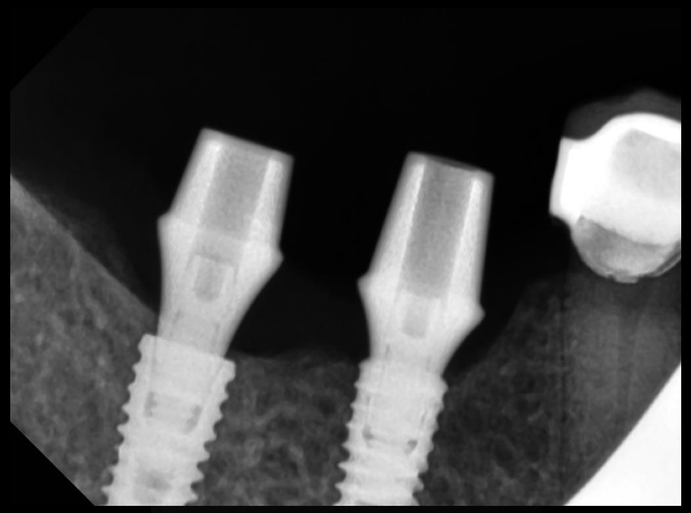

AnyCheck
iST
READ

Abutment

Bridge

Tooth



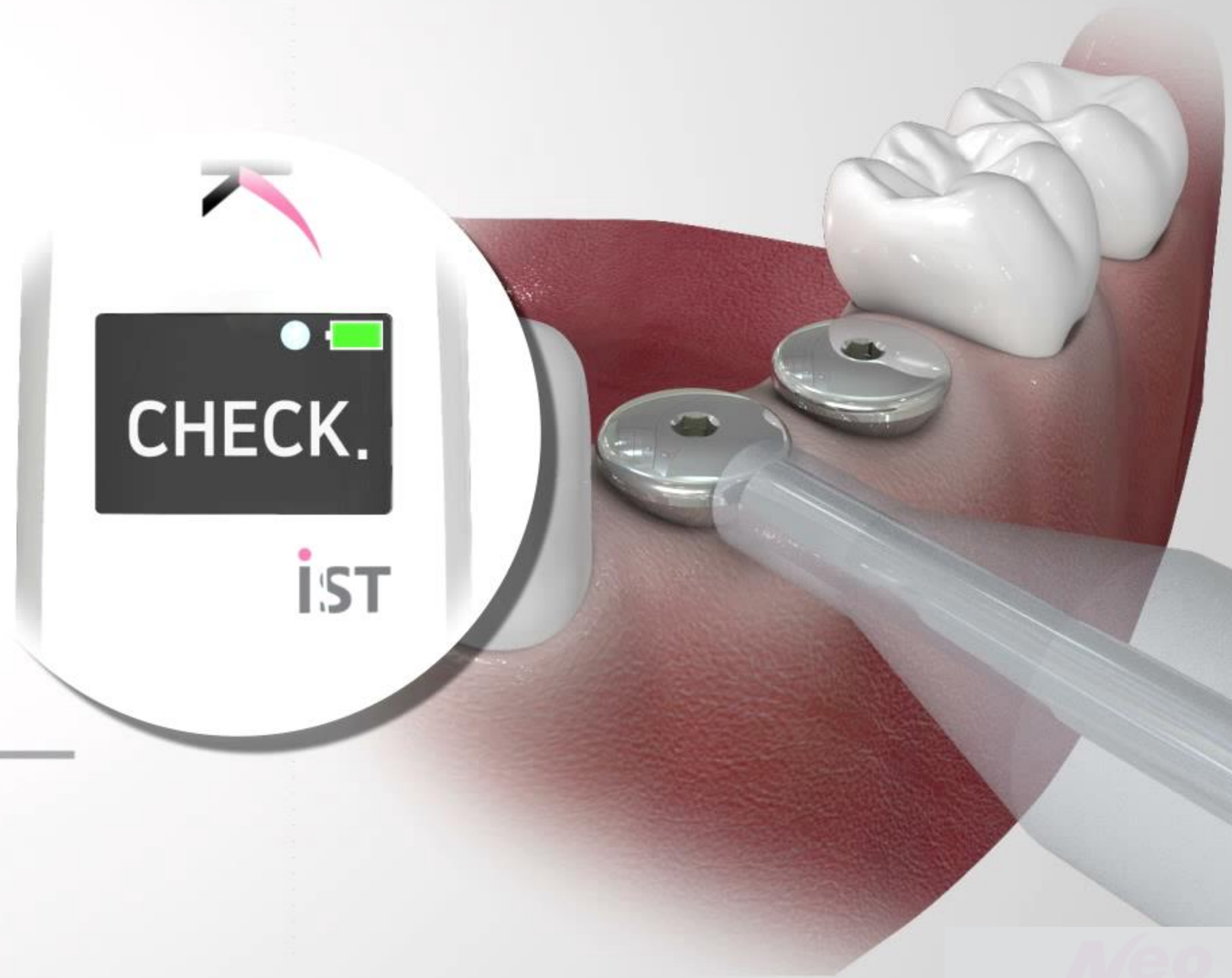


AnyCheck can detect

- Implant stability after loading and tracking the osseointegration

- Inadequate connection between fixture and prosthesis (abutment)

1 Week



1 2 3 4 5 6

Suggested Minimum Requirements for Loading

Insertion Torque: Minimum 30Ncm

&

AnyCheck: Minimum 70 IST

Retrospective Clinical Study on AnyTime Loading

Retrospective Results of Implants for Partially Edentulous Posterior Jaws According to Time Points of Early Loading

Jong-Hwa Kim, DDS[1]/Jin-Yong Yang, DDS, MSD, PhD[2]/Young-Kyun Kim, DDS, MSD, PhD[3]/
Young-Ku Heo, DDS, MSD, PhD[4]/In-Sung Yeo, DDS, MSD, PhD[5]

Purpose: *This study evaluated the survival and success rates and marginal bone loss conditions of early-loaded implants in the posterior maxilla and mandible of partially edentulous patients.* ***Materials and Methods:*** *Implants (n = 209) were placed in 105 patients at two research centers. Provisional fixed dental prostheses were [illegible] implants were classified into four groups according to the loading time (1 to 2, 2 to 4, 4 to 6, and 6 to 8 weeks). Periapical radiographs were taken via a parallel imaging technique, and the peri-implant marginal bone level was measured on the [illegible] implant was lost within 1 month, and one implant was removed at 36 days after loading. The cumulative survival rate of the implants was 97.0%. Implants loaded in the maxilla at 1 to 2 weeks after prosthesis insertion had significantly lower survival rates than any other group (P = .013). [illegible] nificant differences in marginal bone levels among the implant groups classified according to loading time.* ***Conclusions:*** *Early loading is a safe and predictable procedure for implant-supported restoration of posterior partial edentulism. [illegible] implants after maxillary implant insertion.* Int J Oral Maxillofac Implants 2013;28:1293–1299. doi: 10.11607/jomi.2884

- 290 CMI implants(Neobiotech) in 105 pts
- 1-2, 2-4, 4-6, and 6-8wks loading
- 24 month follow-up

JOMI 2013;28:1293-1299

Success rate: 97%

No difference in loading time and location

Table 3 Survival and Success Rates by Loading Time

	Loading time (wk)								
	1–2		2–4		4–6		6–8		
Location	%	n	%	n	%	n	%	n	*P**
Survival rate									
Maxilla	88.9	27	96.8	31	100	53	100	47	.013
Mandible	100	19	91.8	49	97.4	38	100	35	.132
Success rate									
Maxilla	88.9	27	96.8	31	100	53	100	47	.013
Mandible	100	19	91.8	49	97.4	38	100	35	.132

*Chi-square test.

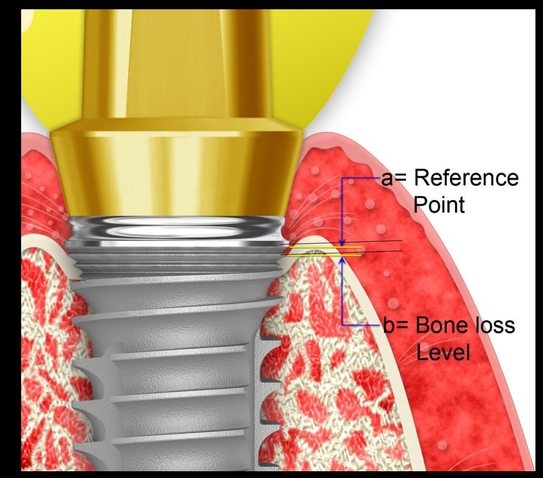
Int J Oral Maxillofac Implants 2013;28:1293–1299.

Table 2 Marginal Bone Loss by Loading Time

Location	Follow-up (mo)	Loading time (wk) 1–2 Mean (mm)	n	2–4 Mean (mm)	n	4–6 Mean (mm)	n	6–8 Mean (mm)	n	*P**
Maxilla	6	0.20 ± 0.17		0.20 ± 0.19		0.20 ± 0.16		0.21 ± 0.16		.996
	12	0.22 ± 0.21	27	0.22 ± 0.19	31	0.26 ± 0.20	53	0.26 ± 0.15	47	.816
	24	0.28 ± 0.22		0.29 ± 0.20		0.29 ± 0.19		0.32 ± 0.16		.928
Mandible	6	0.14 ± 0.29		0.11 ± 0.20		0.23 ± 0.33		0.14 ± 0.23		.384
	12	0.25 ± 0.40	19	0.16 ± 0.25	45	0.28 ± 0.36	37	0.16 ± 0.24	35	.505
	24	0.27 ± 0.17		0.21 ± 0.30		0.29 ± 0.34		0.19 ± 0.27		.735

*Kruskal-Wallis test.

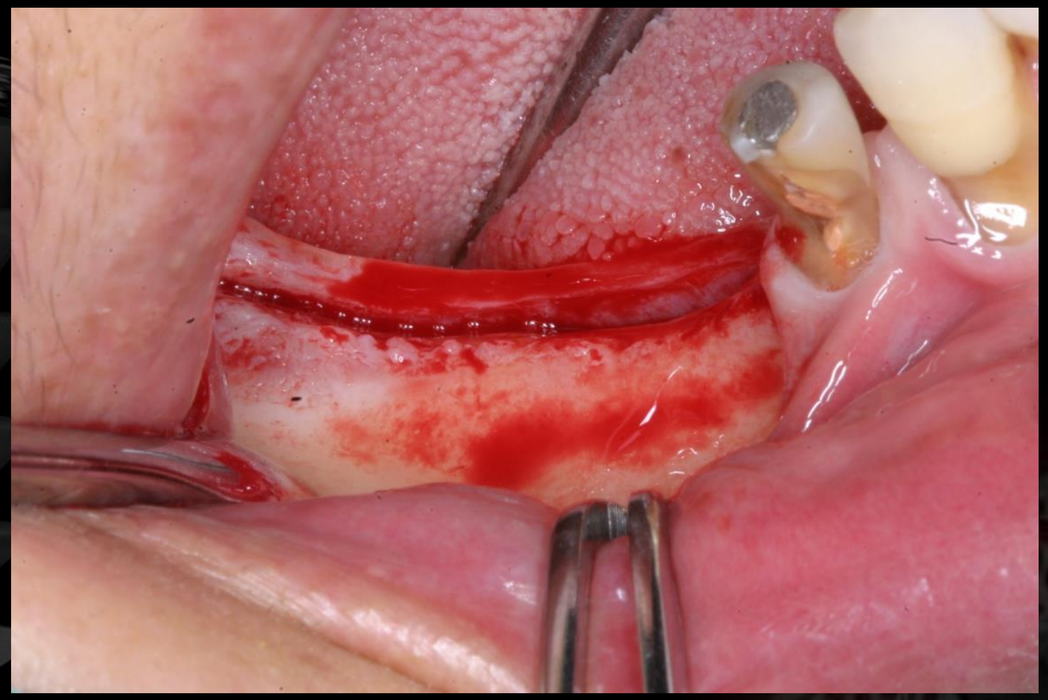
Minimal Marginal Bone Loss: <0.3mm (2 years)

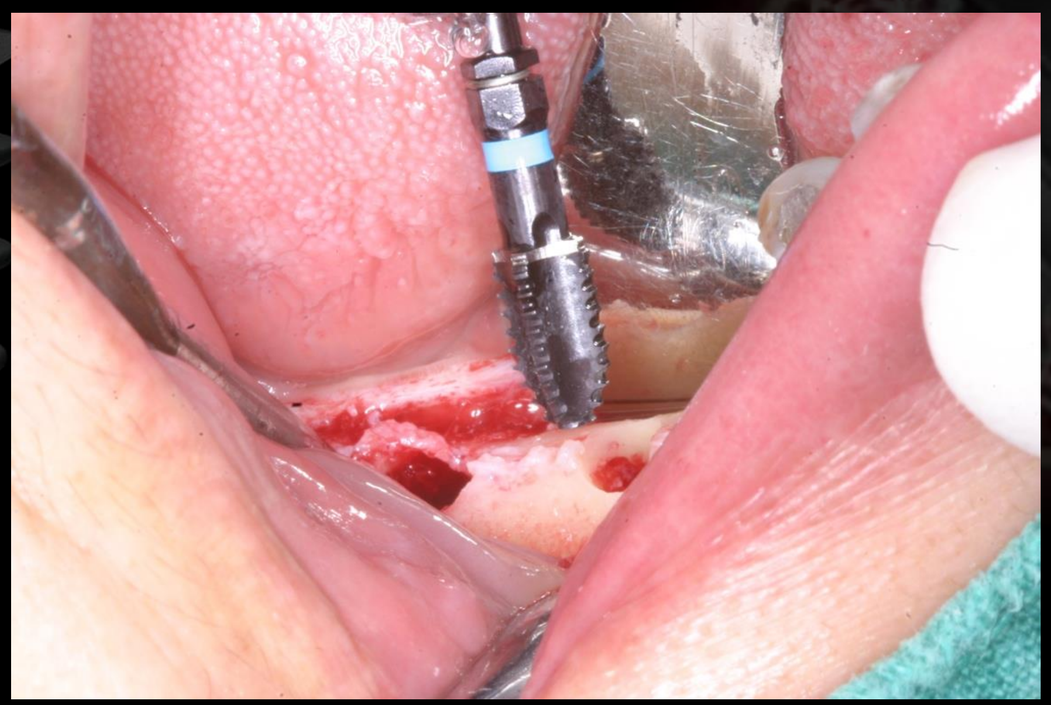


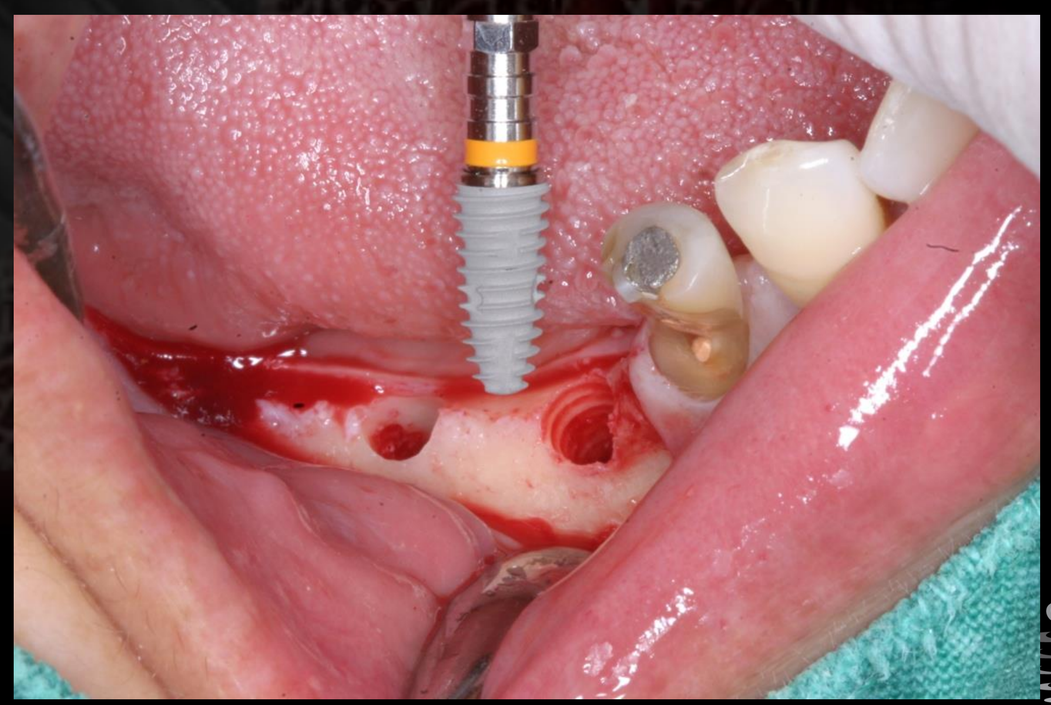
What is the reality of stability change of CMI IS-II active with this drilling protocol in human?

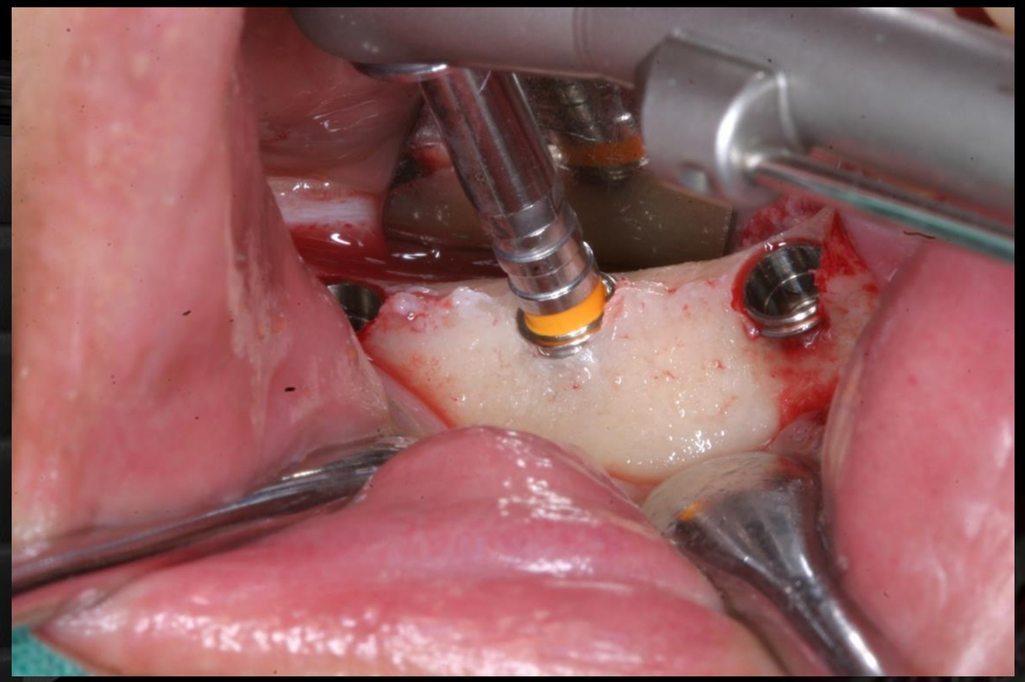
Implant Stability Test: 256 implants in 124 patients

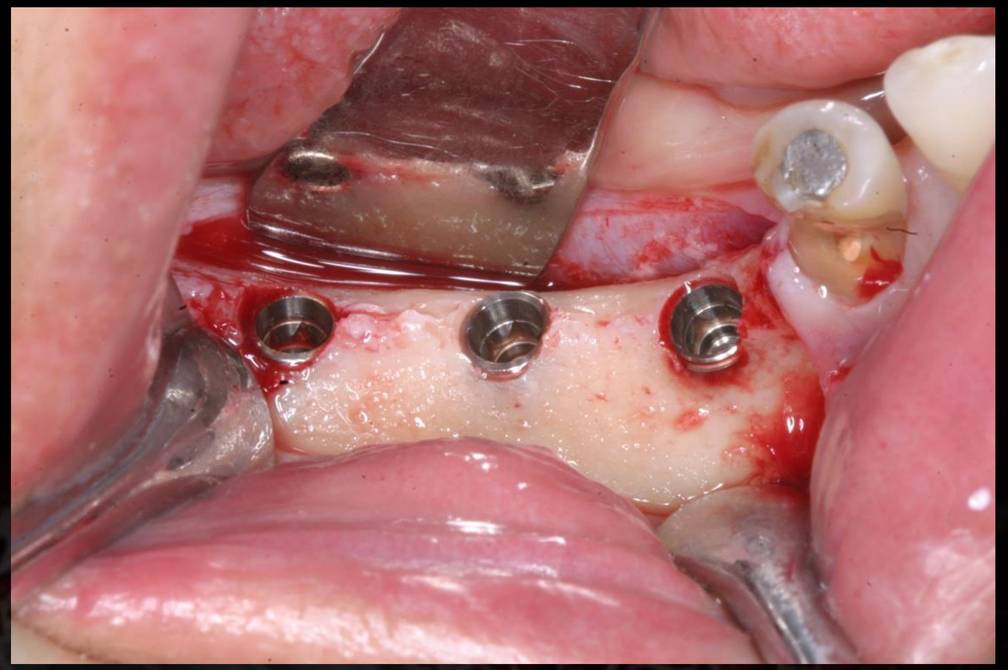
GAO Group Study



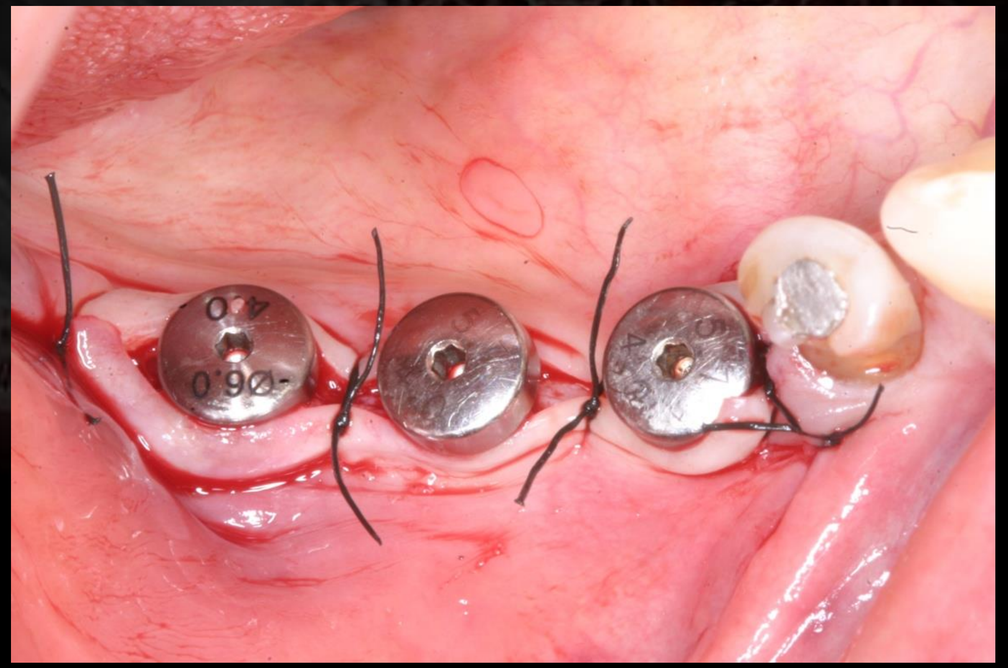









Biotech

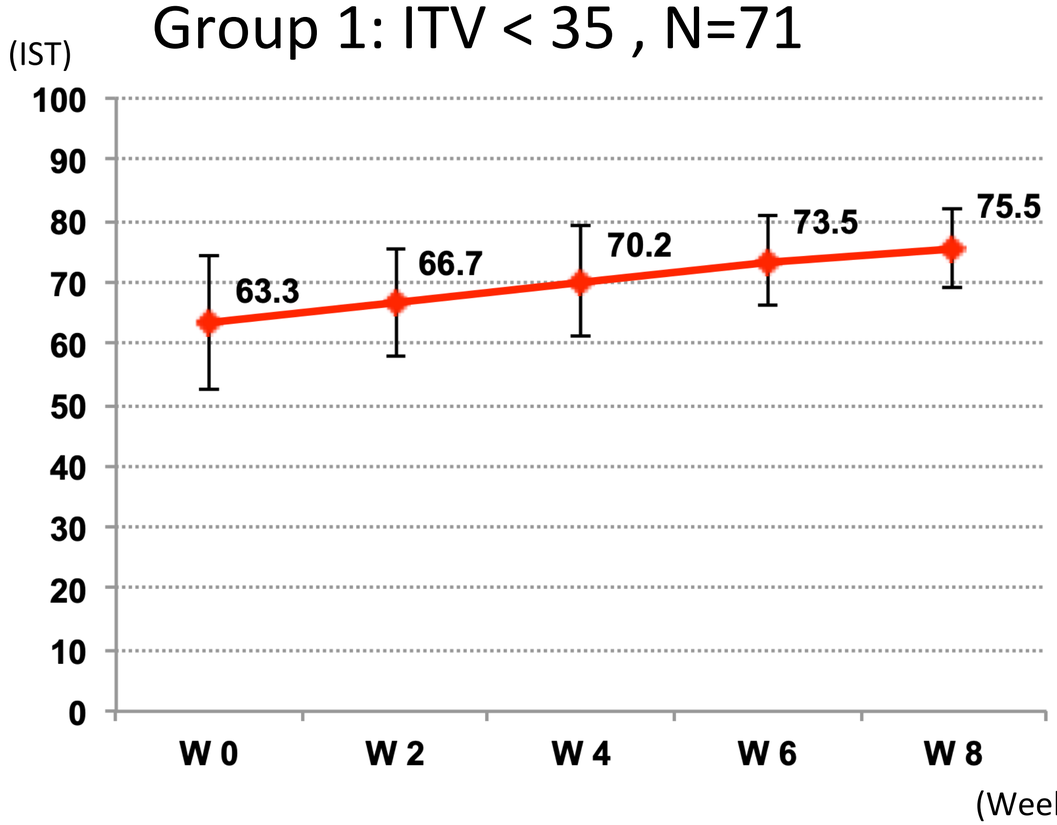

Ø6.0
4.0

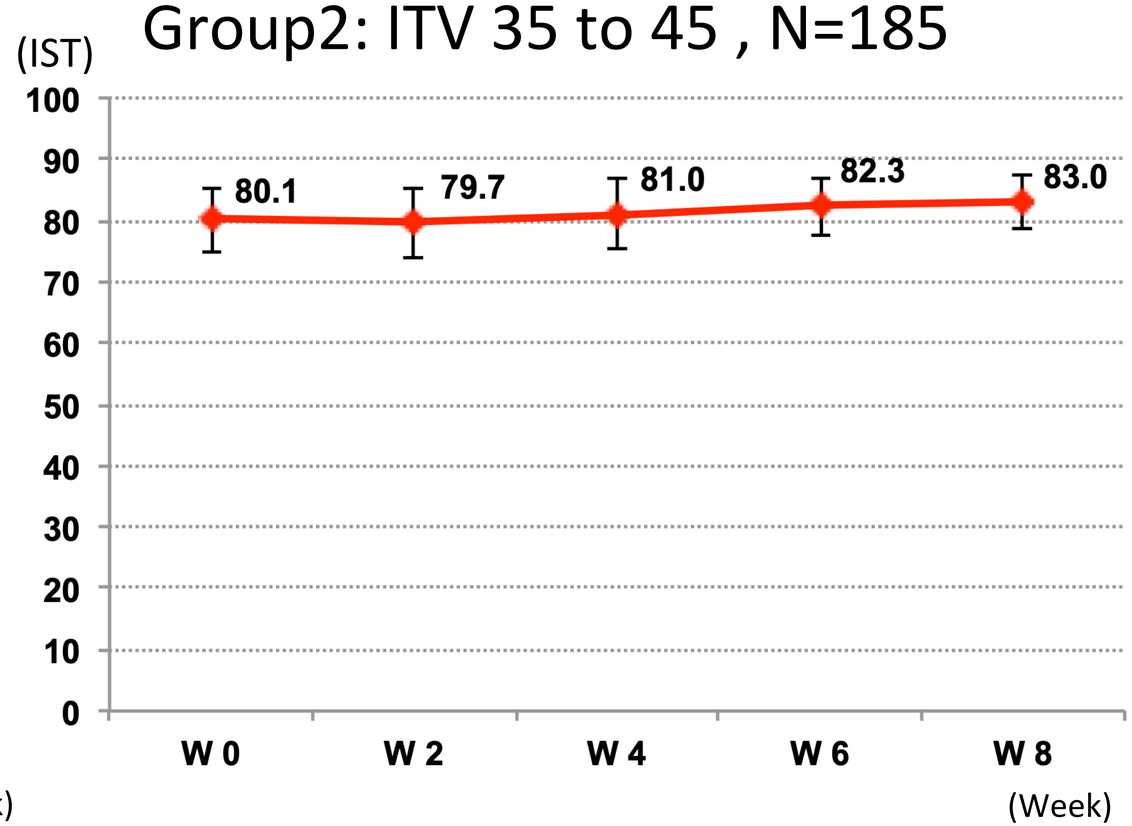
IST values measured at 0, 2, 4wks

Tooth No.	#45	#46	#47
at surgery	84	85	83
2 weeks	85	89	83
4 weeks	85	90	85

#36	#37
86	88
83	84
85	89

Implant Stability Test: 256 implants in 124 patients





GAO Group Study

An impression was made in 2 wks and
a definitive prosthesis were delivered in 4 wks.

CMI ISII active

3 year follow-up

7 year follow-up(07 Dec 2016)

GAO 4 week Loading Protocol

with AnyCheck

Day 0 : Guided surgery (No Flap), Torque, AnyCheck

Week 2: Follow up, AnyCheck, Make impression

Week 4: AnyCheck, Delivery of Definitive Prosthesis

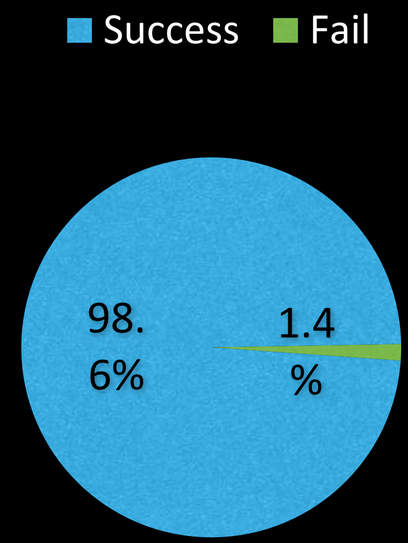
Check the Pattern of Stability (AnyCheck) for 4 weeks, Load only if the ist value is ncreased or maintained

GAO Group Retrospective Study of AnyTime Loading

- 4 Clinics: YK Heo, NY Kim, JY Kim, JH Kim
- Total Implants Placed: 2674
- Implant placed: CMI IS-II active
- IL/EL: 1403, IP: 960, DIP: 324, Sinus Area: 928
- 8 Year follow up (2011~2018)

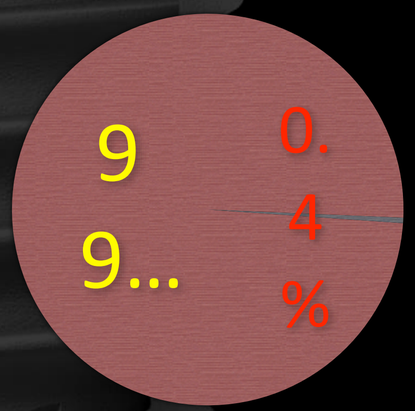
9 Year Results

	Mx. Anterior	Mx. Posterior	Mn. Anterior	Mn. Posterior	Total
No. of Implant	453	928	157	1136	2674
Fail	6	11	3	17	37
Success rate	98.7	98.8	98.1	98.5	98.6

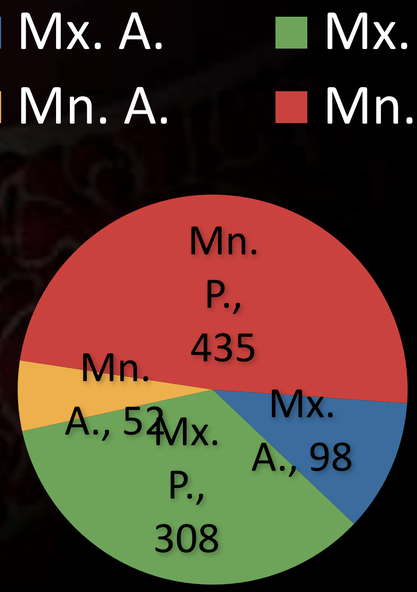


(2011~2019 GAO group multi study)

8 Year Results of Early Loading

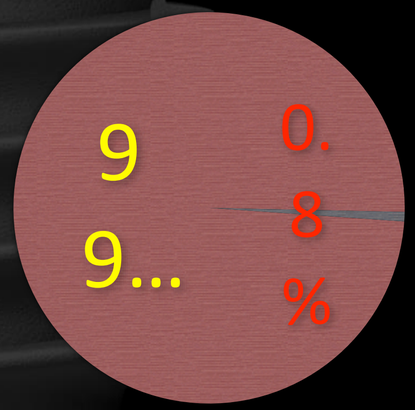


	Mx. Anterior	Mx. Posterior	Mn. Anterior	Mn. Posterior	Total
No. of Implant	453	928	157	1136	2674
No. of E/L	98	308	52	435	893
Fail	0	2	0	2	4
Success rate	100.0	99.4	100.0	99.5	99.6

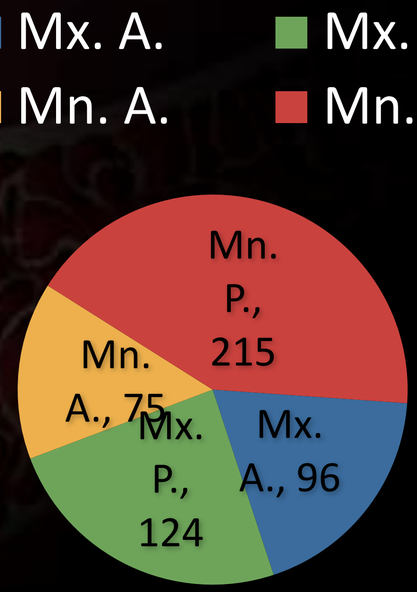


(2011~2018 GAO group multi study)

8 Year Results of Immediate Loading



	Mx. Anterior	Mx. Posterior	Mn. Anterior	Mn. Posterior	Total
No. of Implant	453	928	157	1136	2674
No. of I/L	96	124	75	215	510
Fail	0	1	1	2	4
Success rate	100.0	99.2	98.7	99.1	99.2

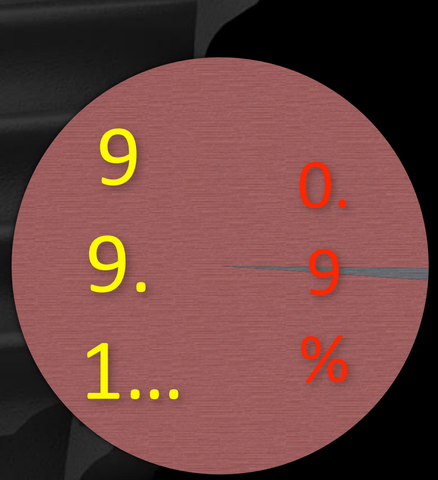


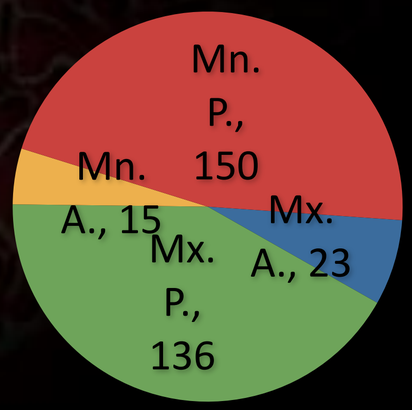
(2011~2018 GAO group multi study)

8 Year Results of Delayed Immediate Placement

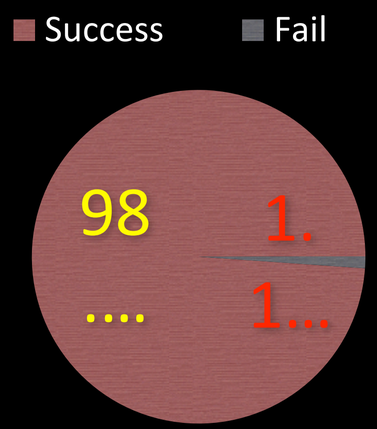
	Mx. Anterior	Mx. Posterior	Mn. Anterior	Mn. Posterior	Total
No. of Implant	453	928	157	1136	2674
No. of DI/P	23	136	15	150	324
Fail	0	1	0	2	3
Success rate	100.0	99.3	100.0	98.7	99.1

(2011~2018 GAO group multi study)

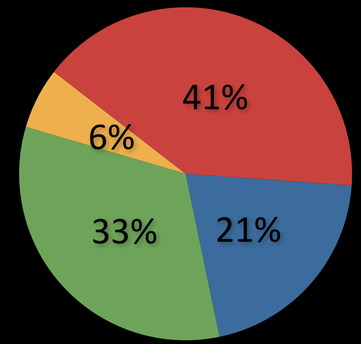




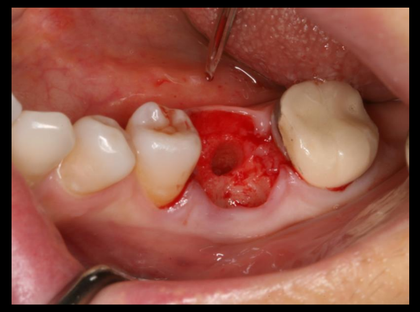
8 Year Results of Immediate Placement

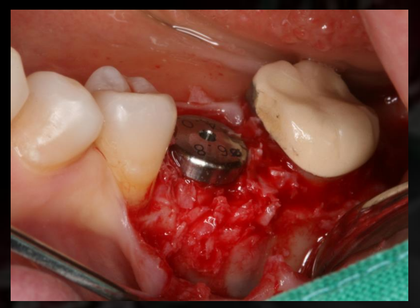


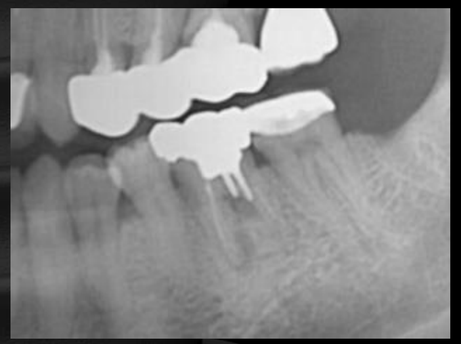
	Mx. Anterior	Mx. Posterior	Mn. Anterior	Mn. Posterior	Total
No. of Implant	453	928	157	1136	2674
No. of I/P	198	315	57	390	960
Fail	2	4	1	4	11
Success rate	99.0	98.7	98.2	99.0	98.9



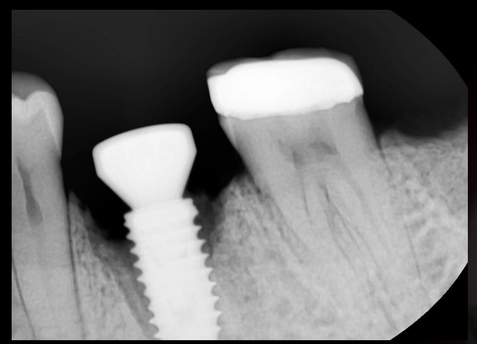
(2011~2018 GAO group multi study)





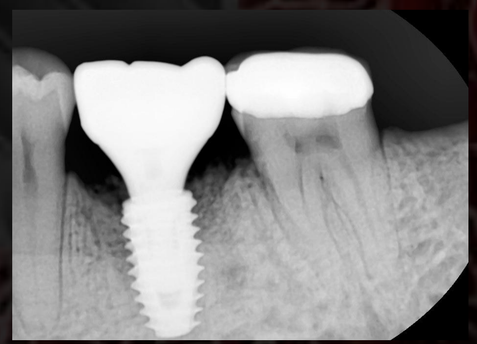


2011. 07. 25



2011. 08. 08
after insertion

2012. 03. 28



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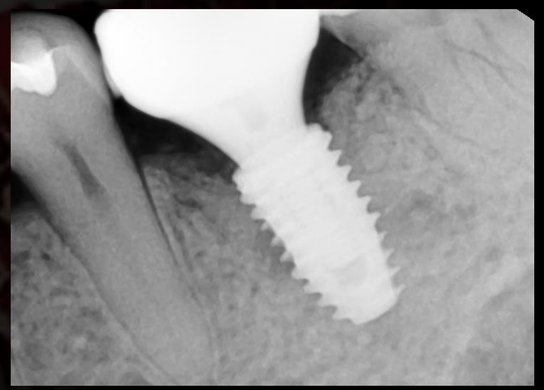
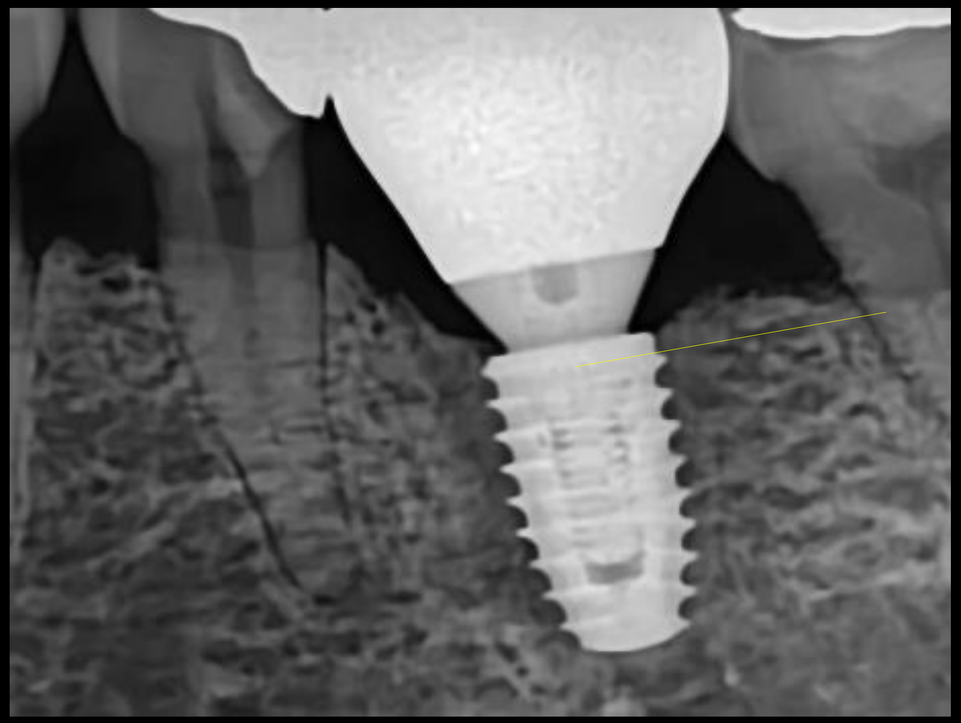


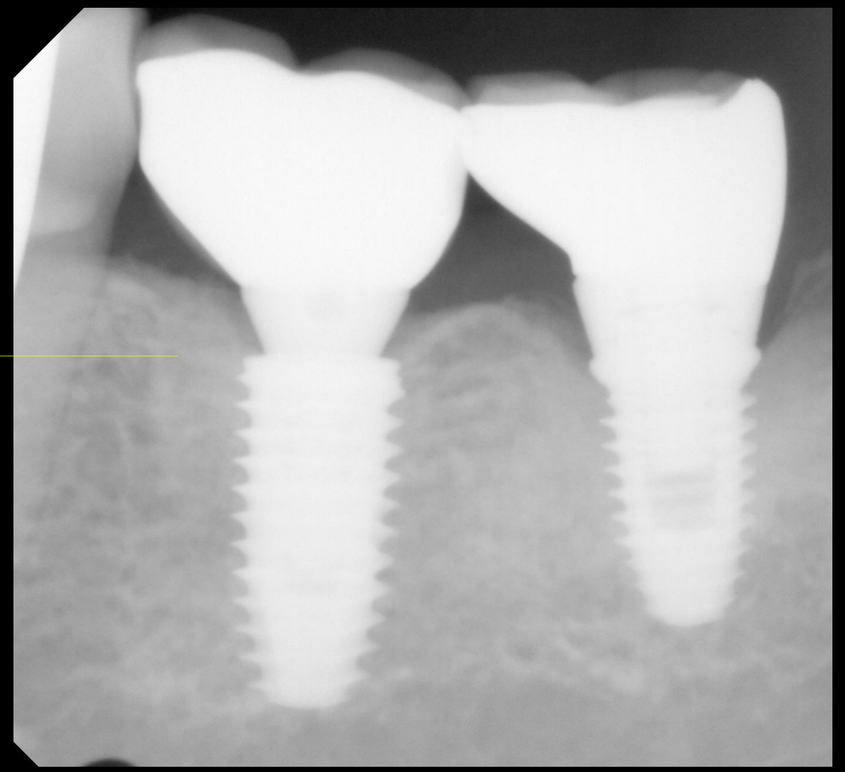
2016 05.
5 year follow-up

Mean Marginal Bone Loss : +0.28mm

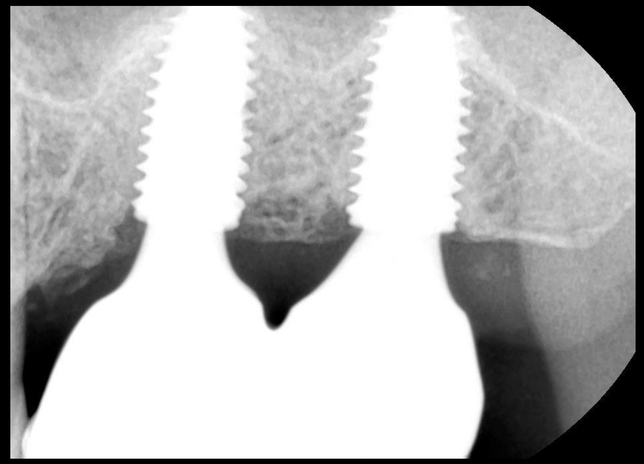
-Mesial: +0.3mm

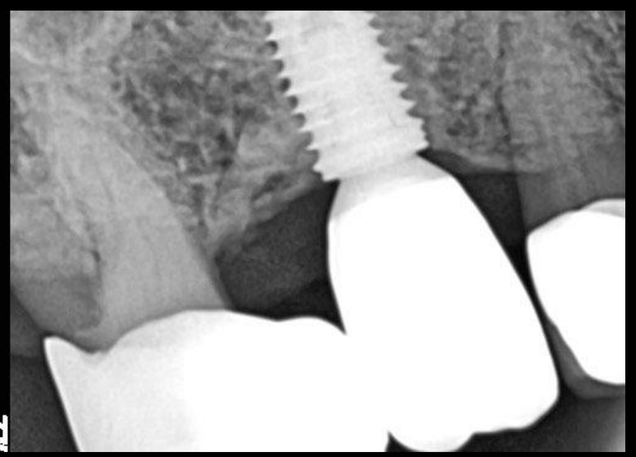
-Distal: +0.25mm

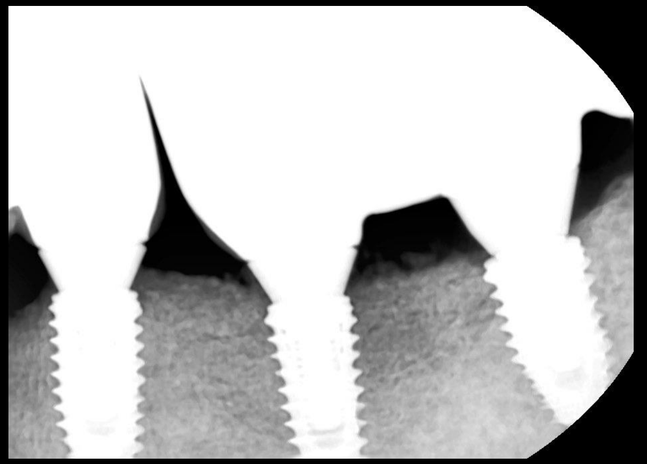




8 yr Result of IS-II active Implants

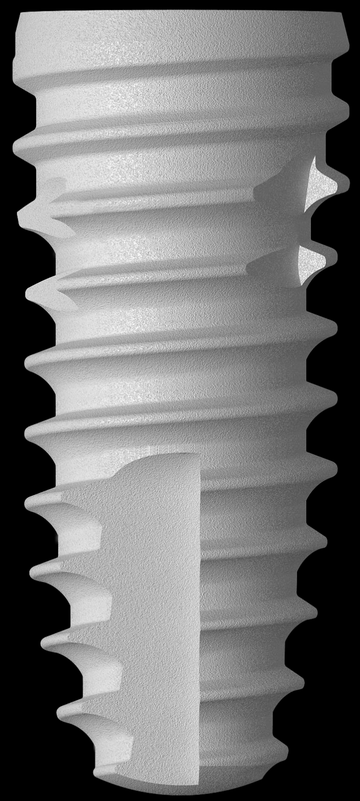


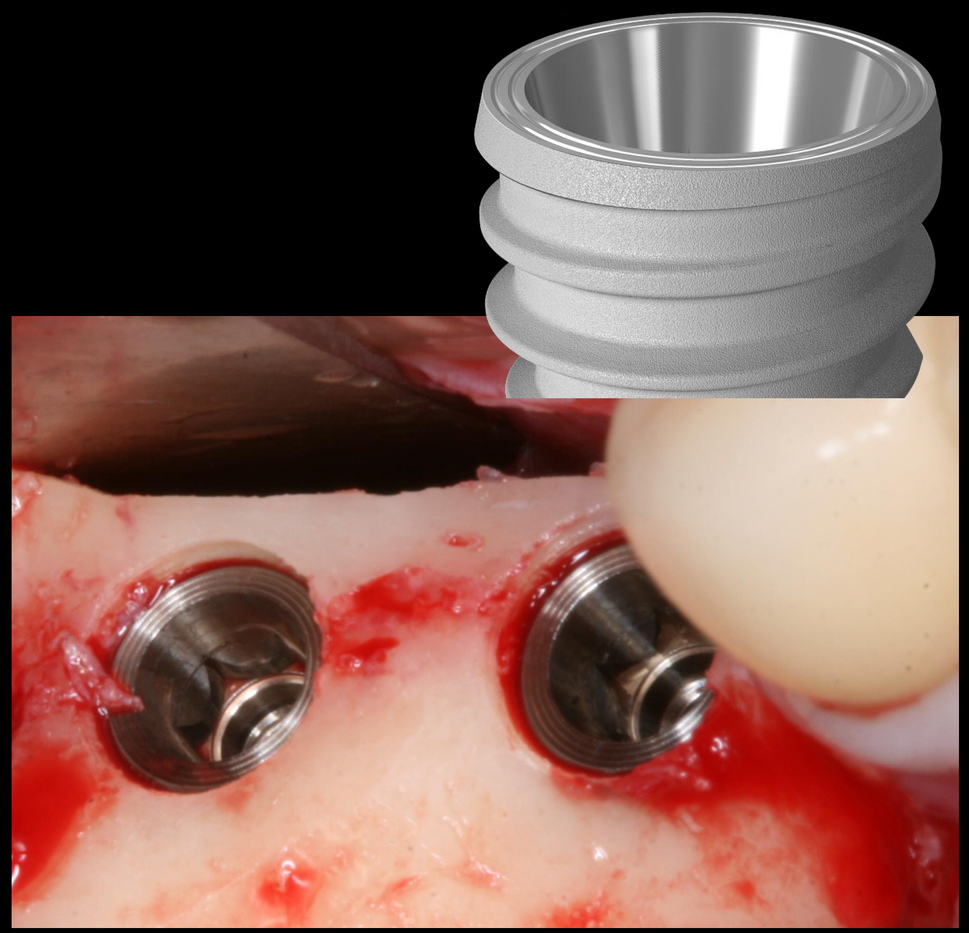


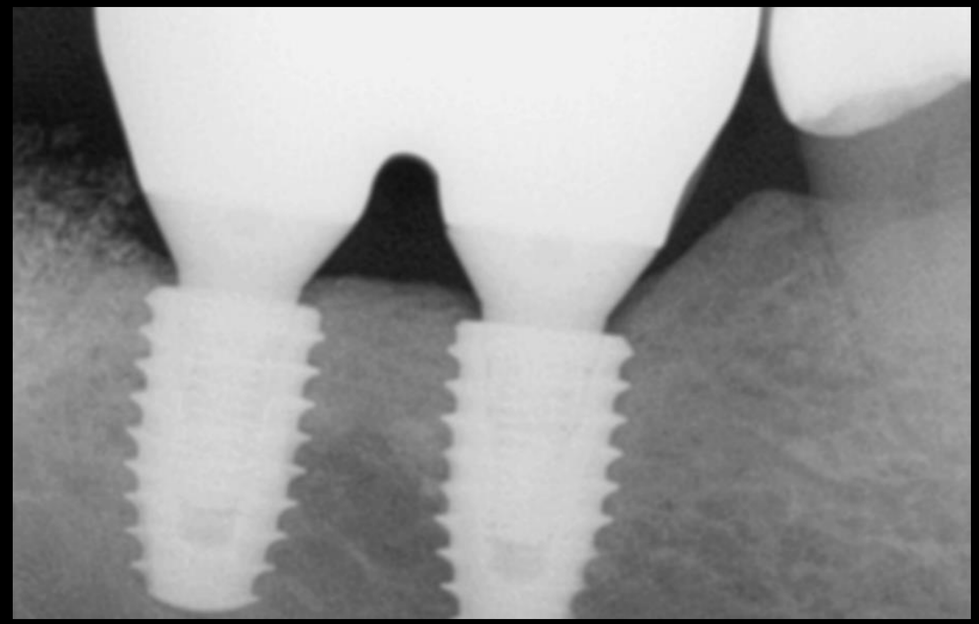


(2011~2018 GAO group multi study)

CMI IS-III active







CMI IS-II active

S Bioseal 0.5mm

thread pitch 0.8mm

S.L.A. Surface

VS

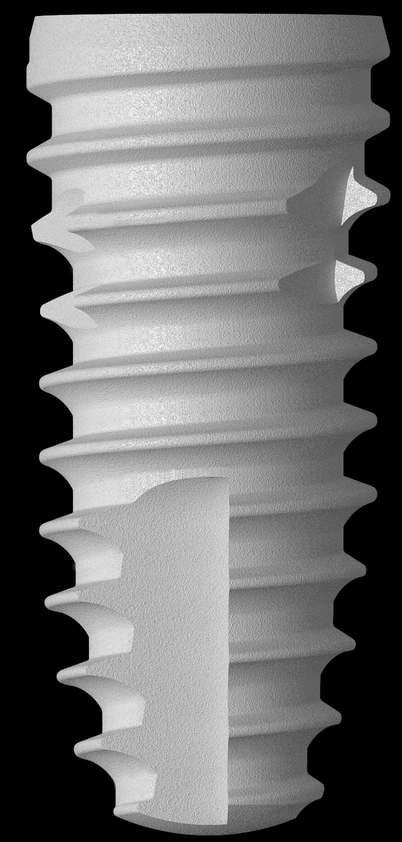
2016

CMI IS-III active

Platform Bioseal

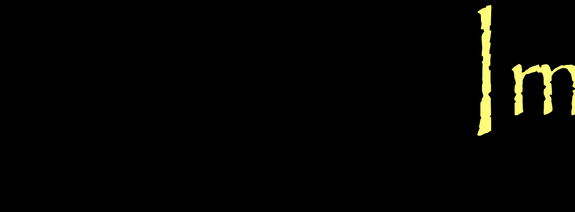
0.9mm thread pitch

S.L.A. Surface

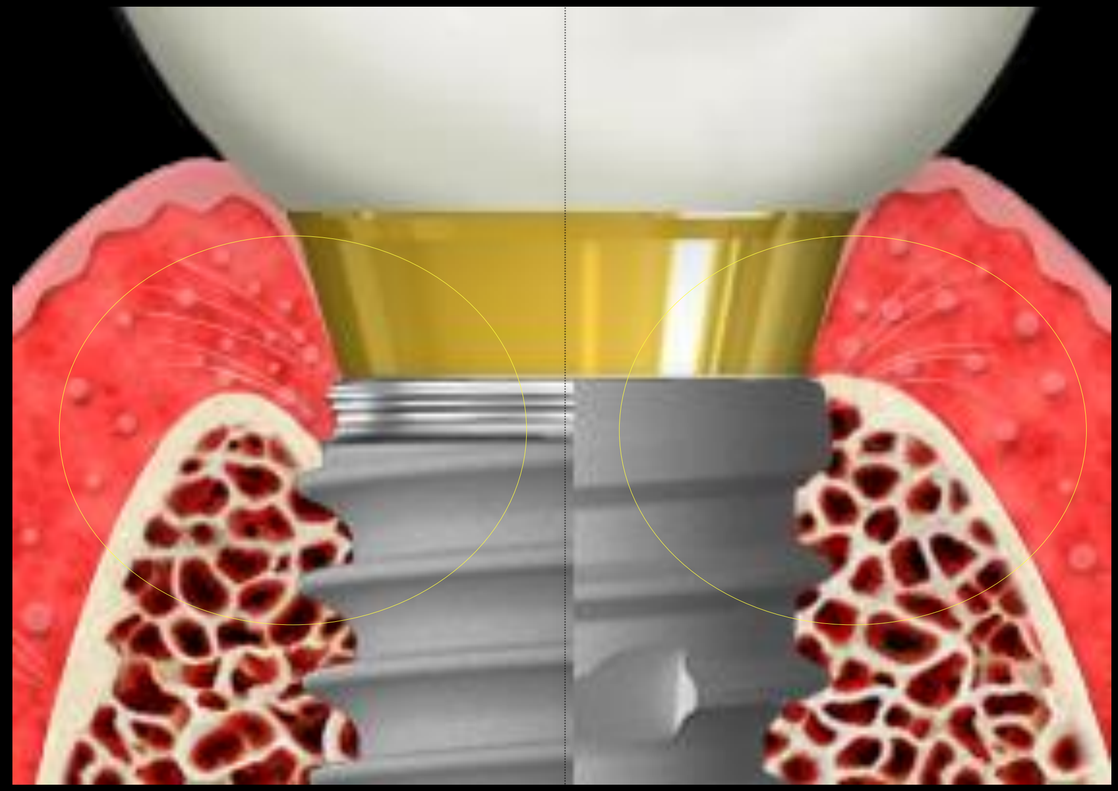


Implant Coronal Designs

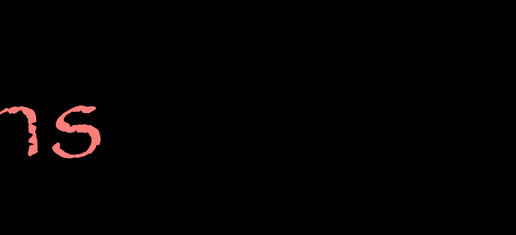
BioSeal



CMI IS-II
active



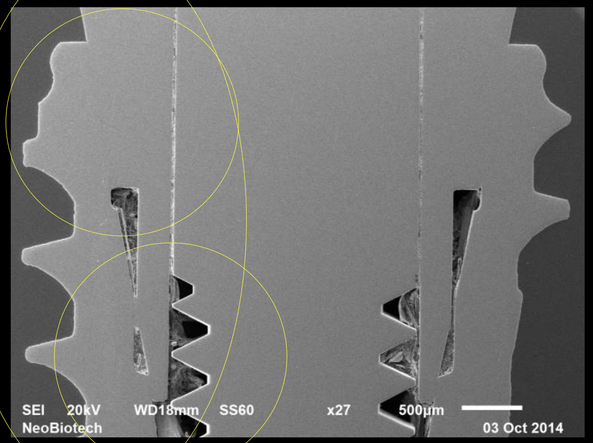
Platform
BioSeal

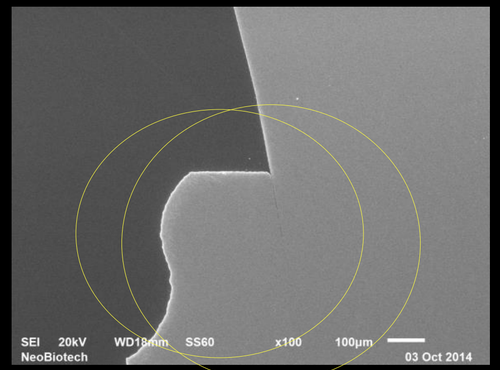


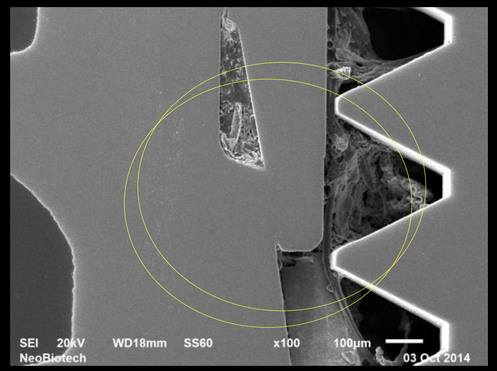
CMI IS-III
active

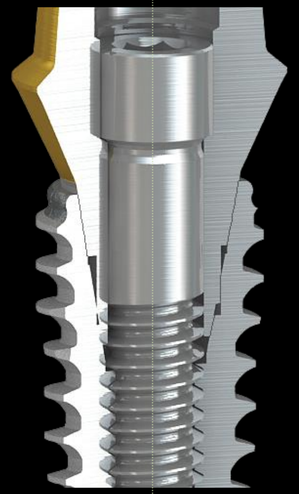
CMI IS-II active

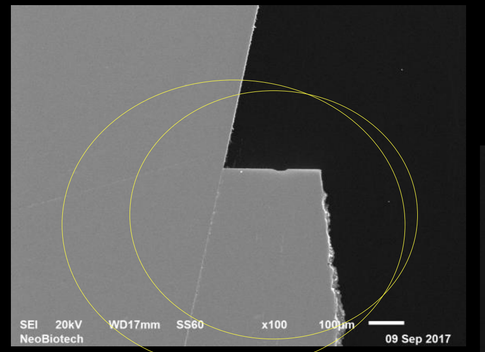
CMI IS-III active

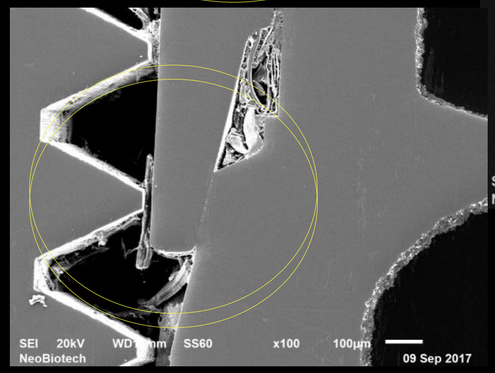


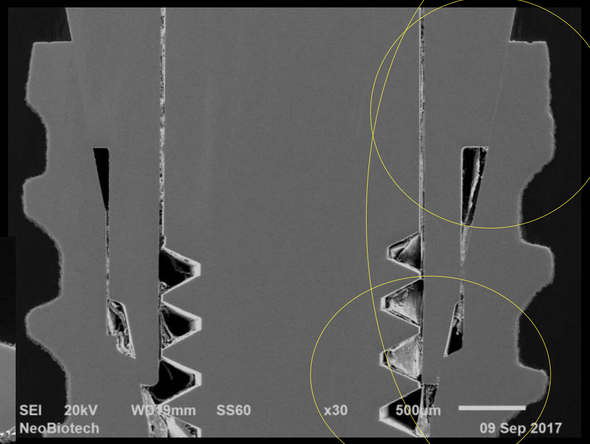






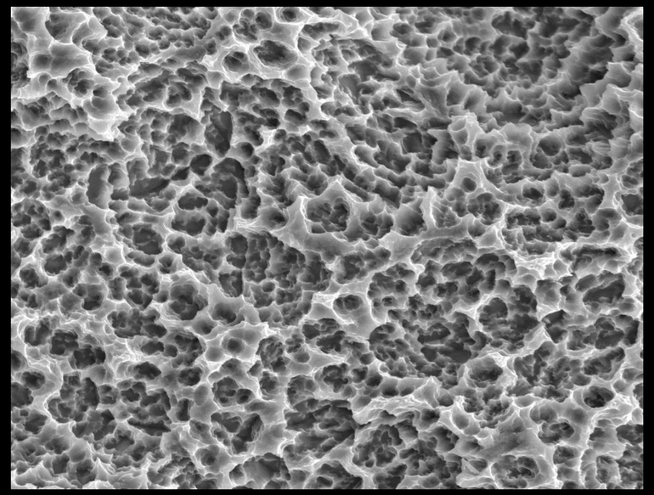


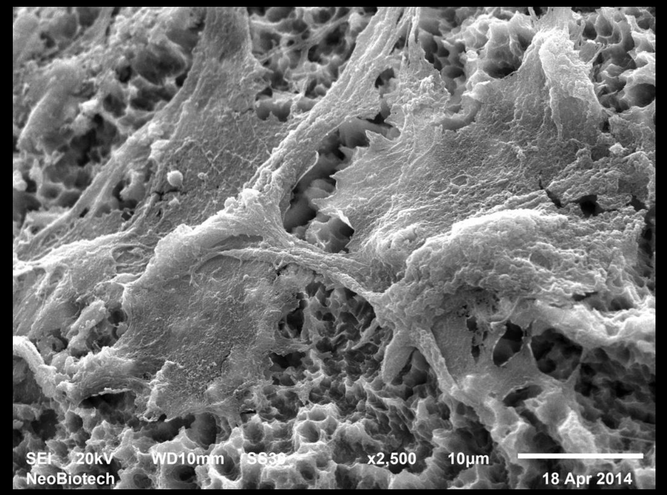


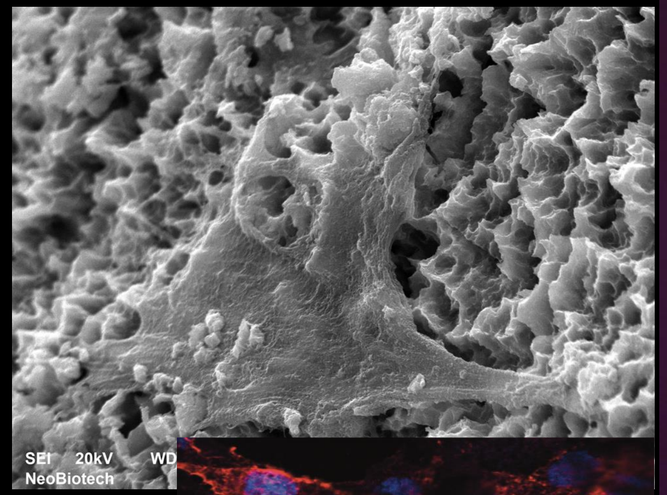


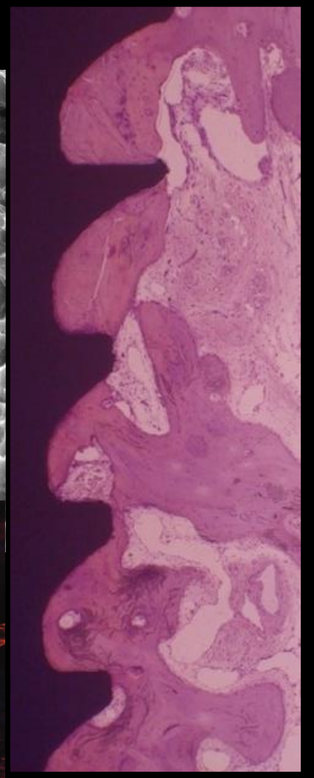
Neo Biotech
Satisfaction to Dentists

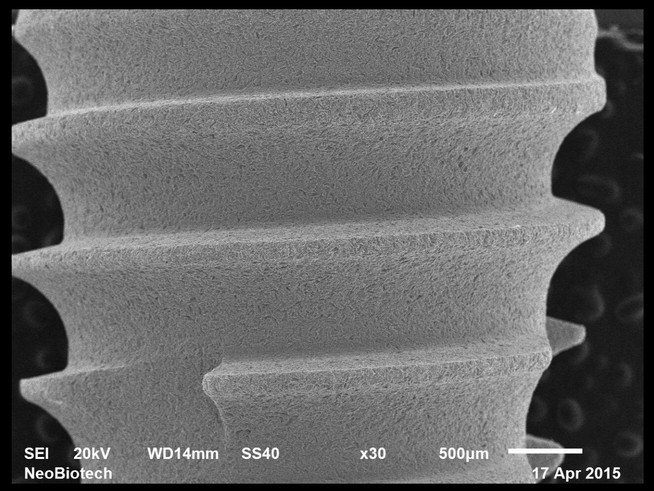
S.L.A. Surface Treatment



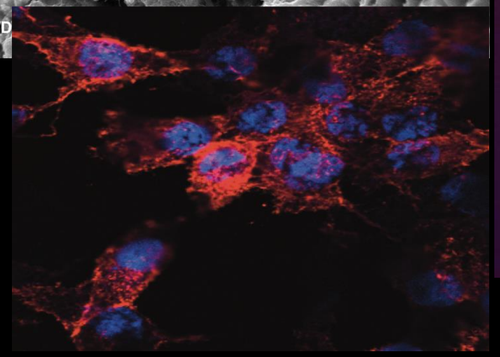


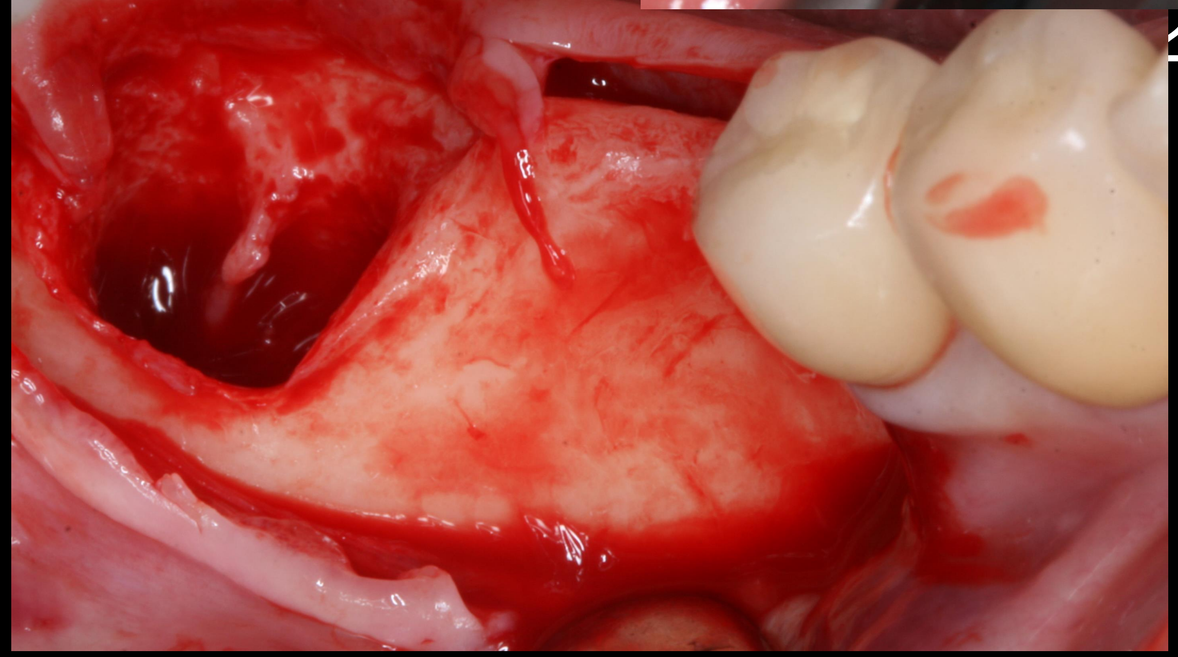


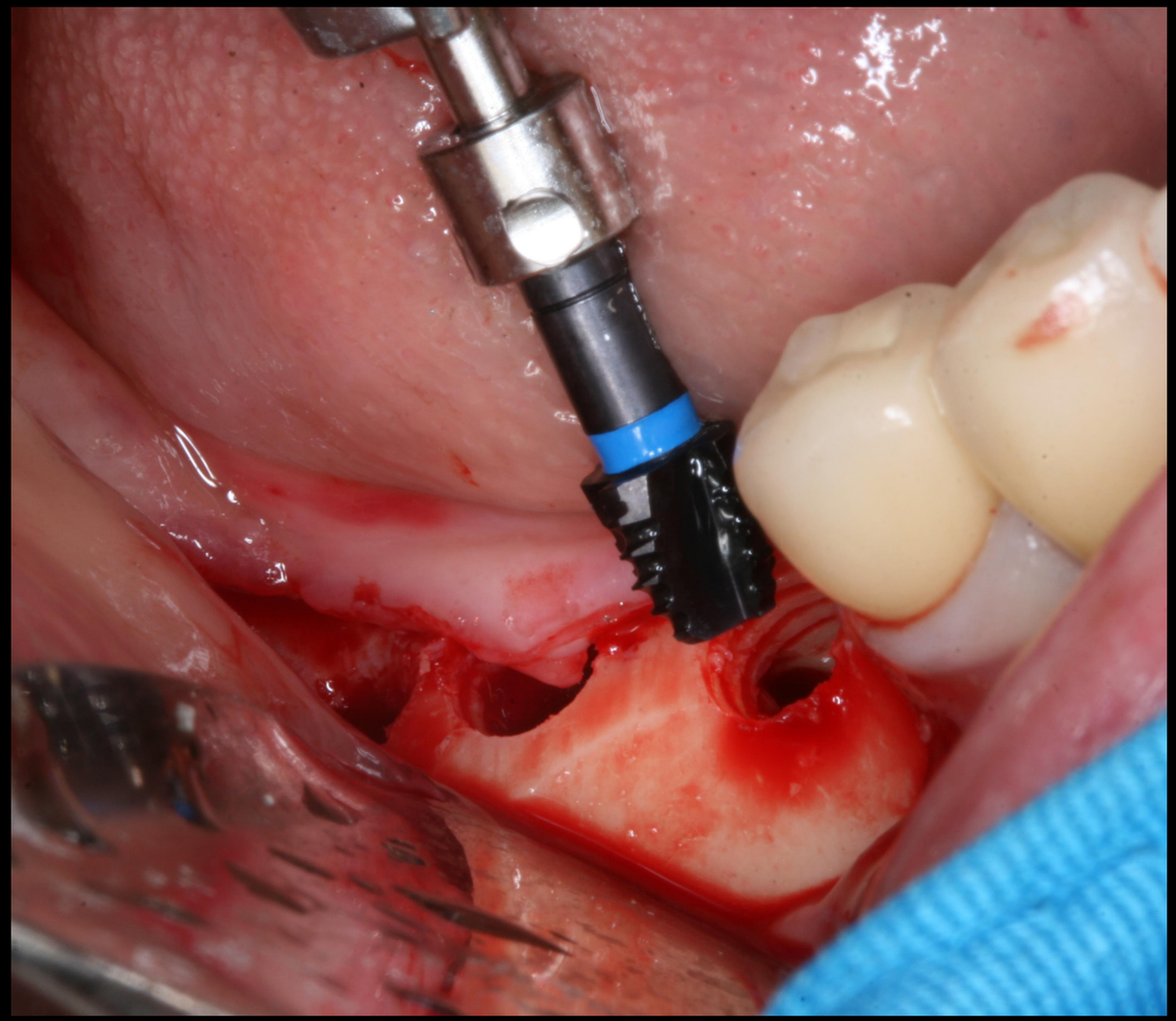


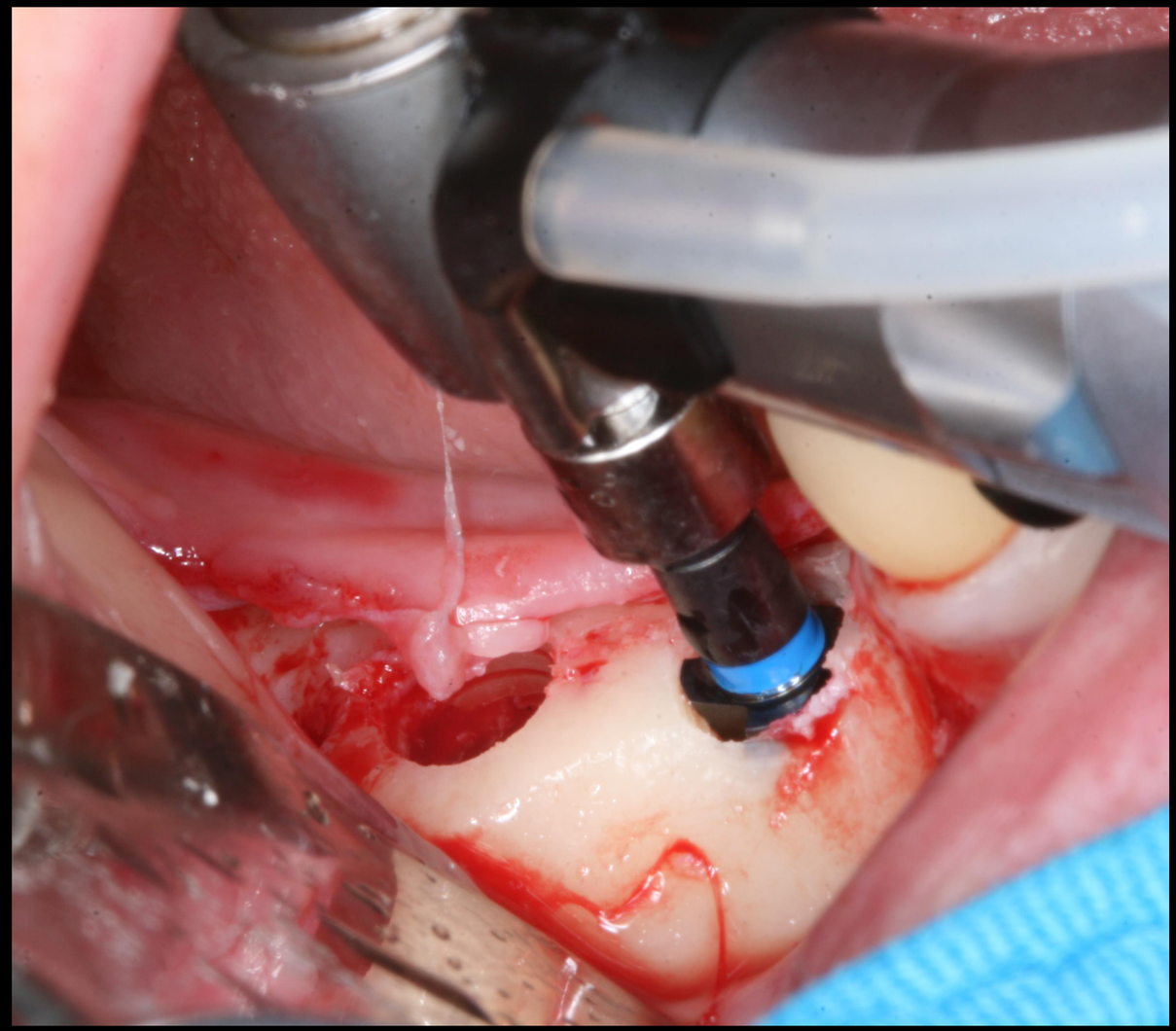


CMI active

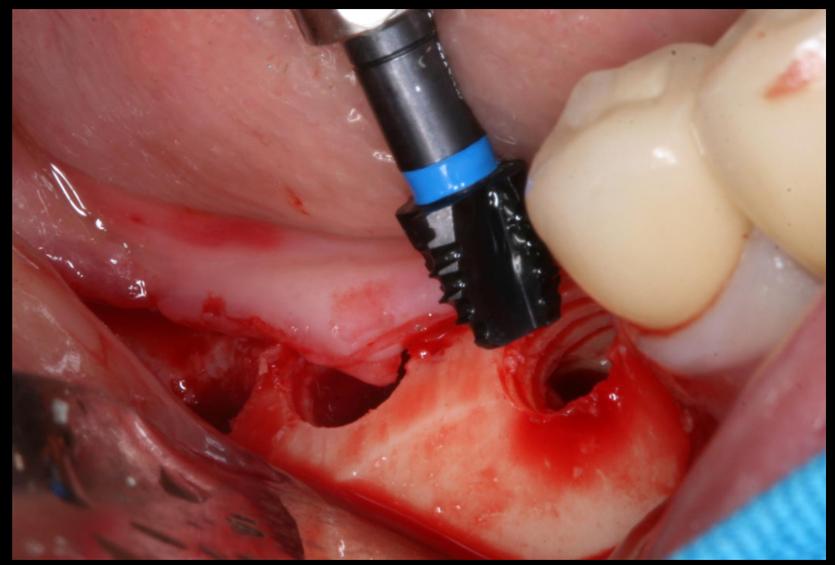


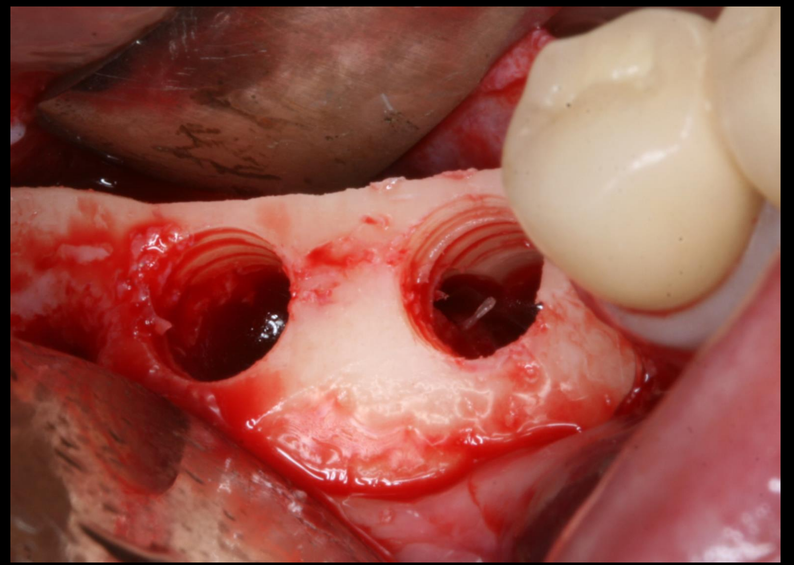


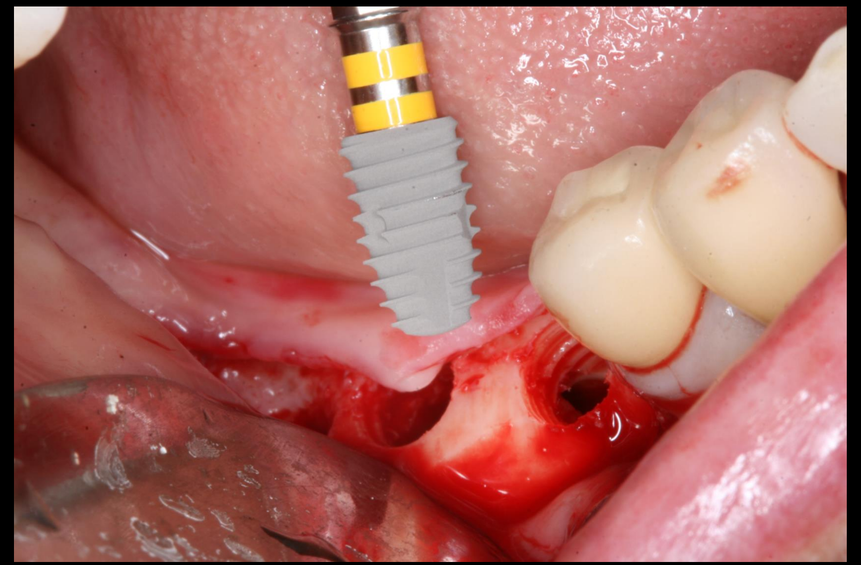


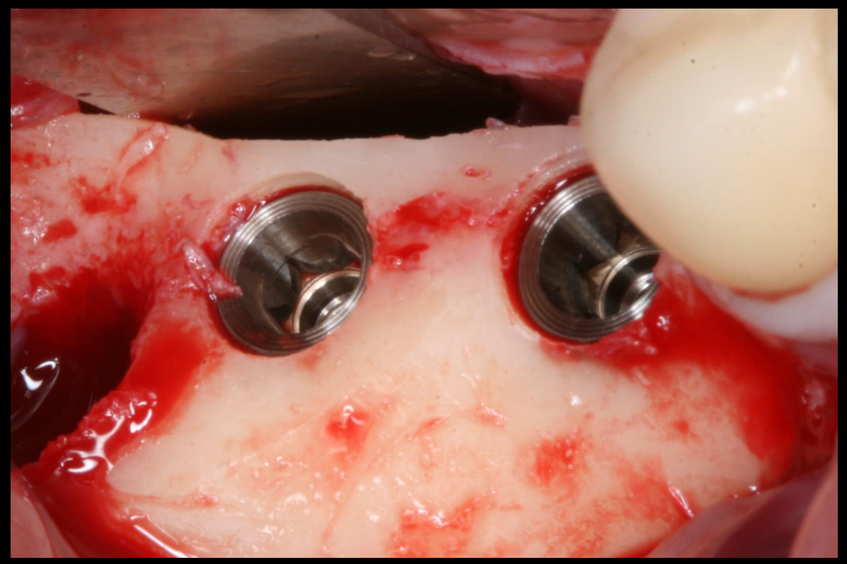


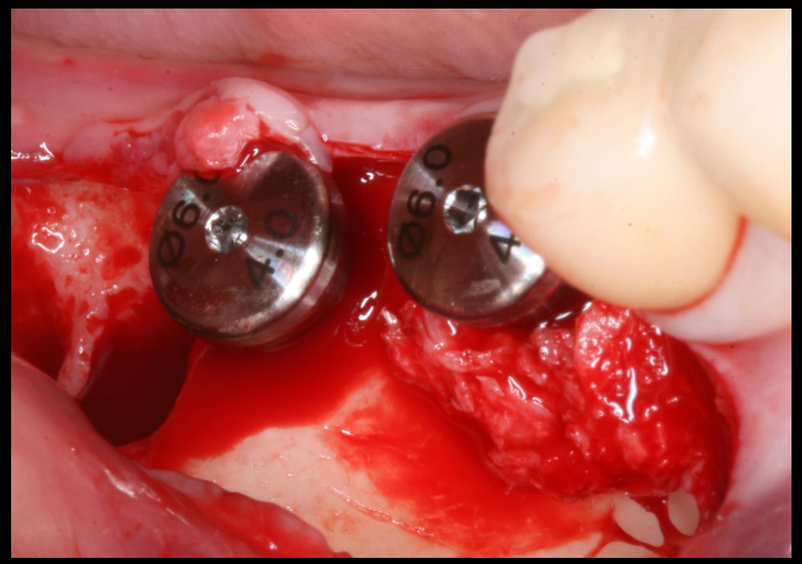
IS-III active clinical case 1

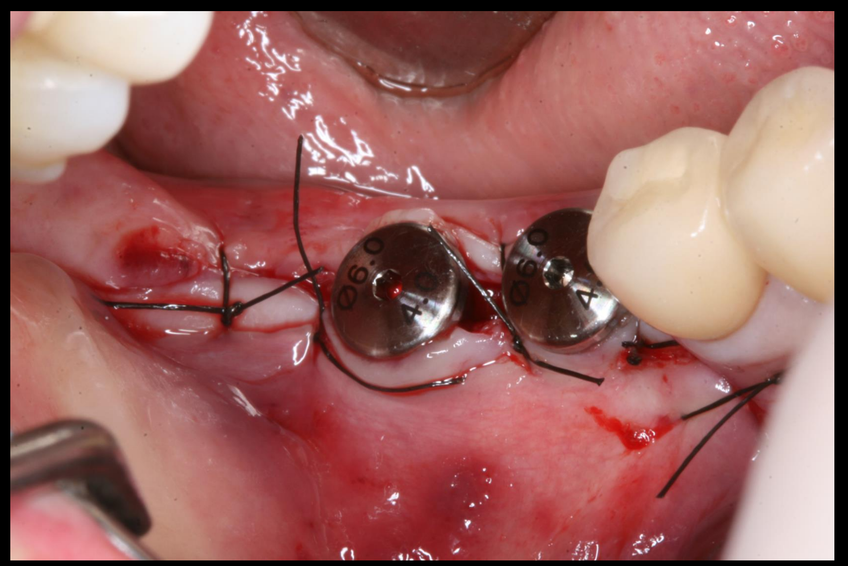






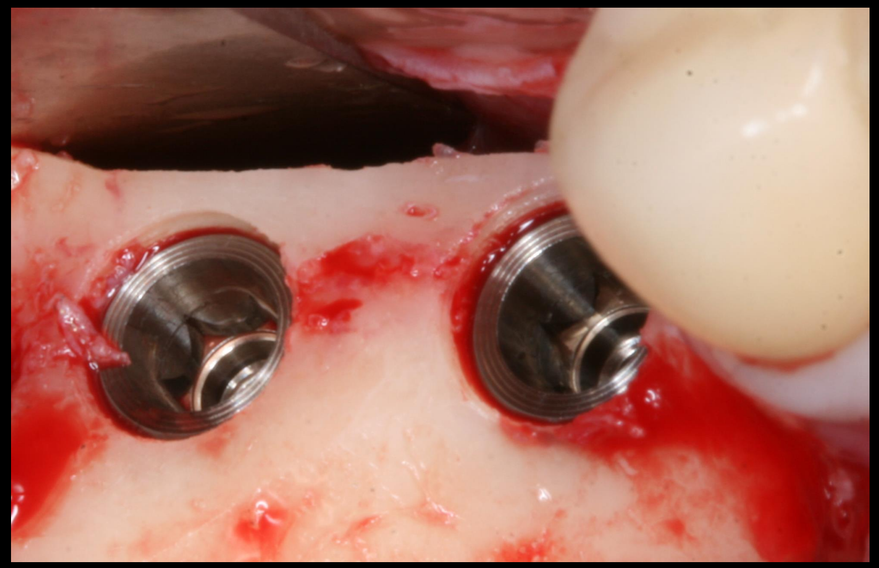




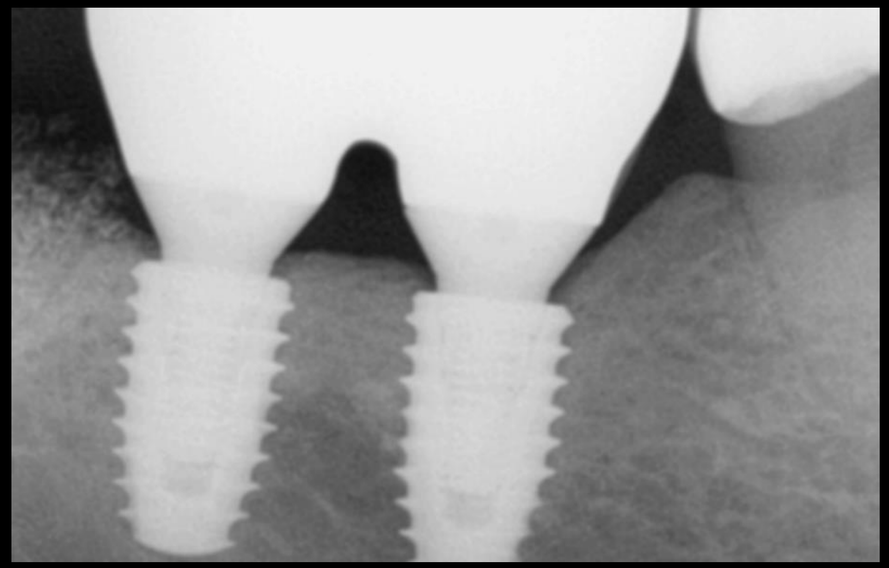


Clinical Result of CMI IS-III active

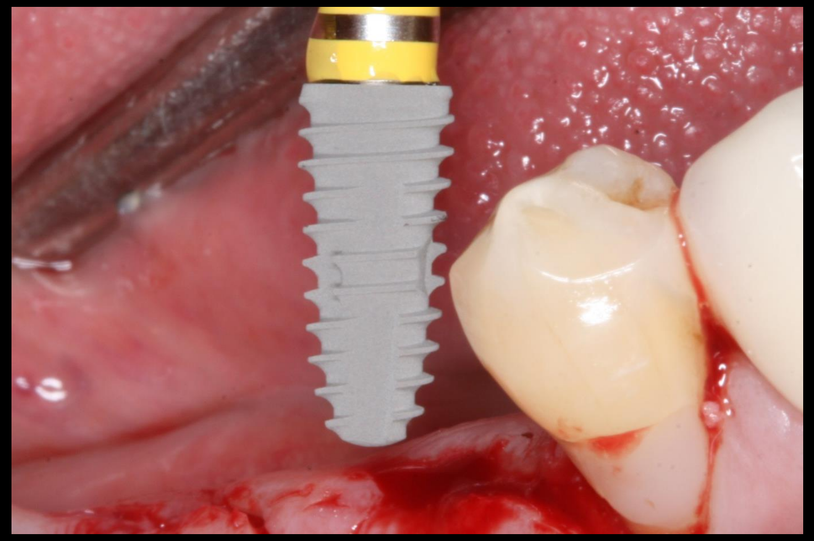
Platform
Bioseal

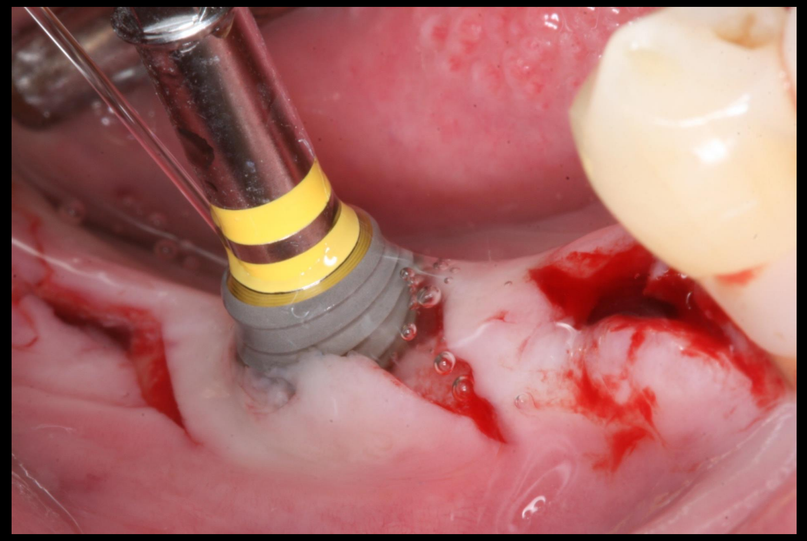


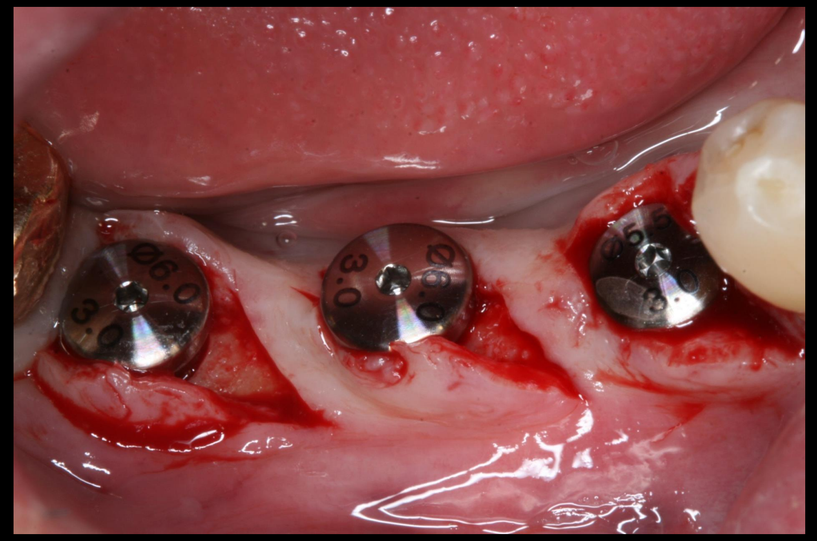
2 year
result



IS-III active clinical case 2





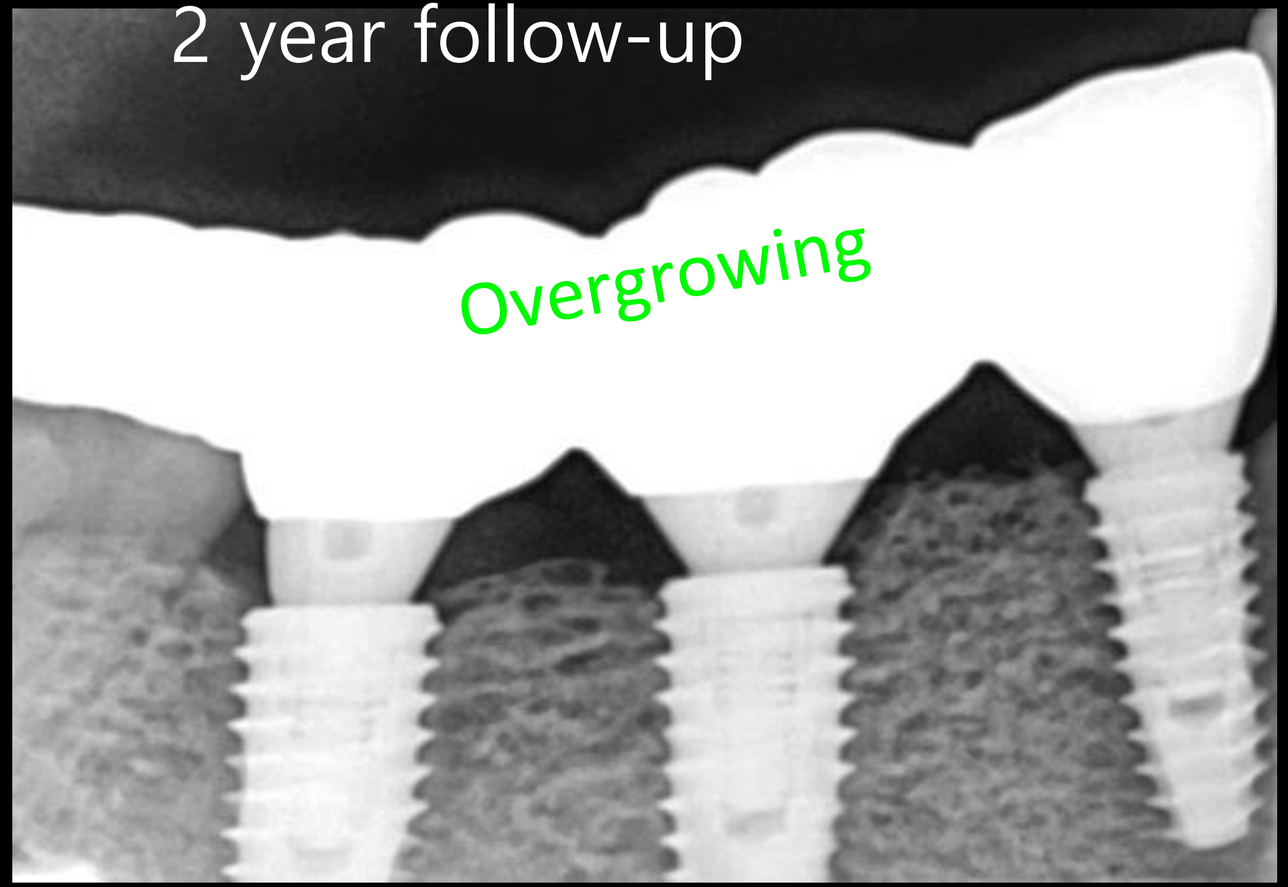


Full Zr 3 unit SCRP 6 weeks after the surgery

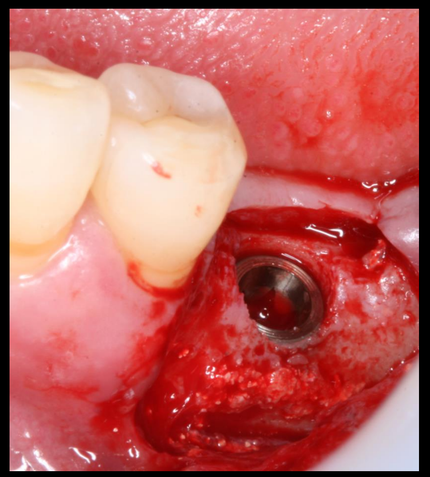
IS-III active clinical case 2

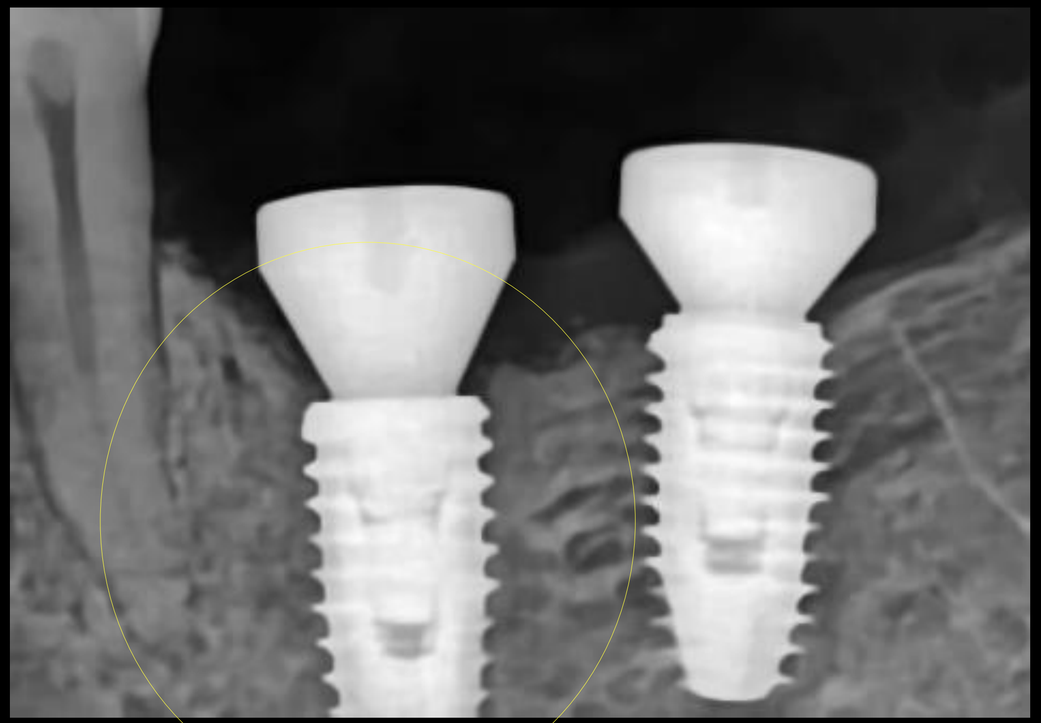
Platform Bioseal

2 year follow-up



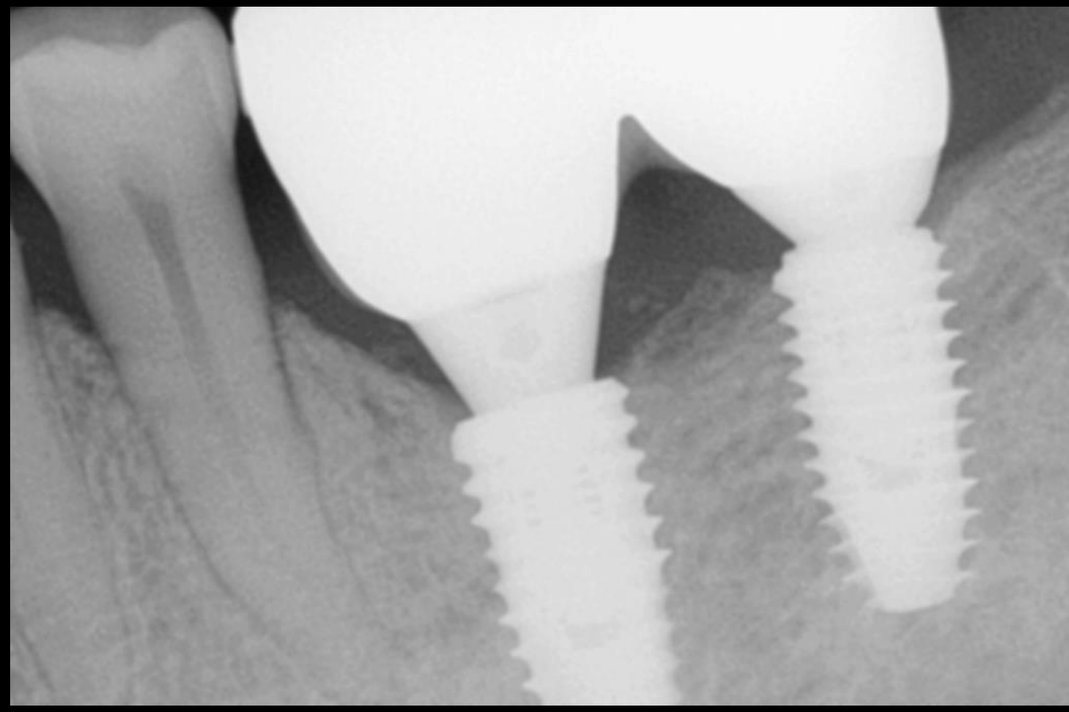
IS-III active clinical case 3





2016.06

Overgrowing

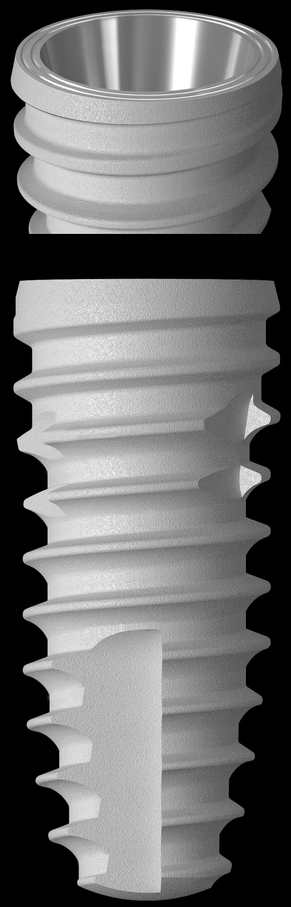


2017.08　1 year later

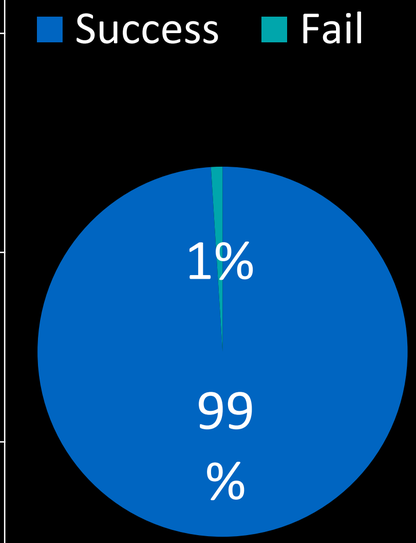
IS-III active clinical case 4

2 year follow-up

IS-III active 5 year Success rates

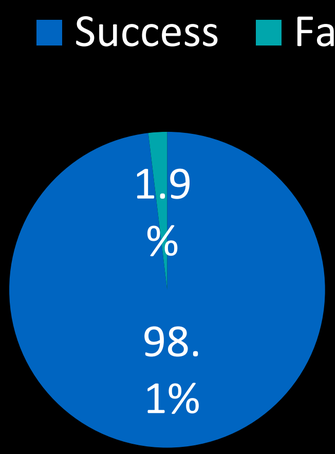


	Mx. Anterior	Mx. Posterior	Mn. Anterior	Mn. Posterior	Total
No. of Implant	26	108	8	112	254
Fail	0	2	0	1	3
Success rate	100	98.1	100	99.1	98.8

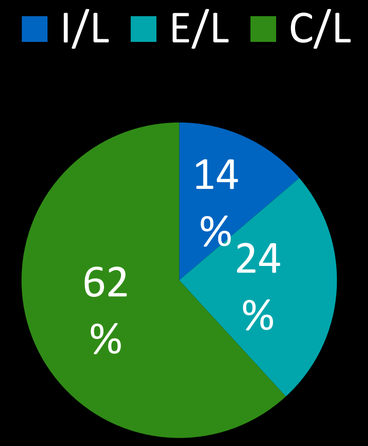


(2017 GAO group multi study)

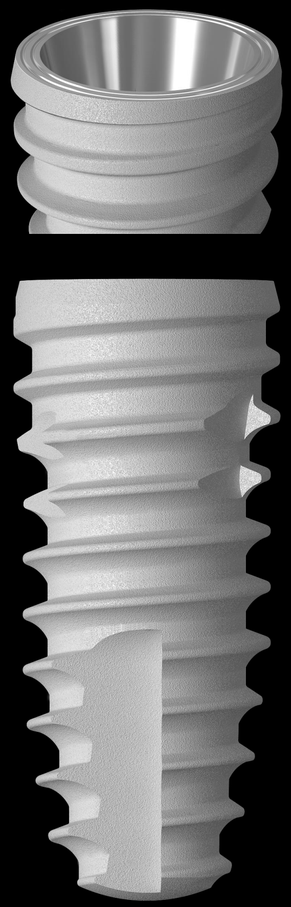
IS-III active Success rates: IL/EL vs CL



	IP	DIP	I/L	E/L	C/L
Total	254				
No. of Implant	39	11	35	62	157
Fail	0	0	0	0	3
Success rate	100	100	100	100	98

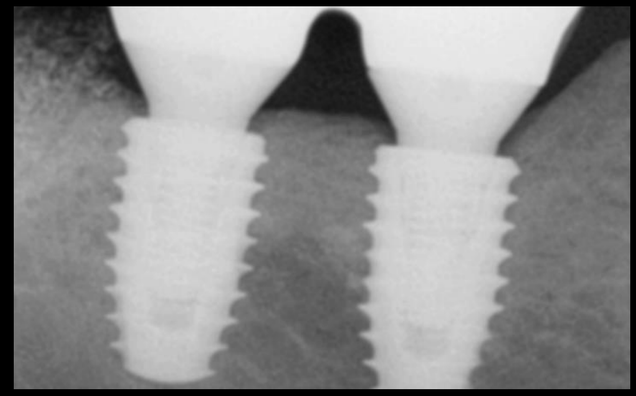


(2017 GAO group multi study)



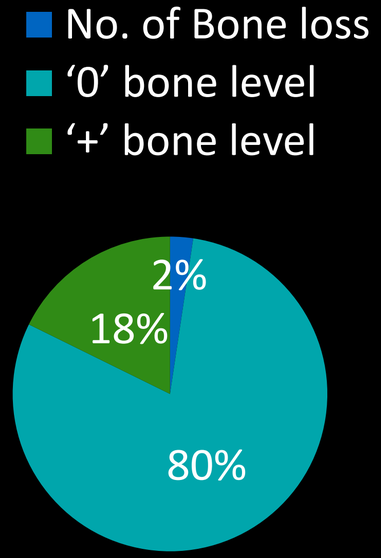
IS-III active Bone level

3 Year Results



	Mx. Anterior	Mx. Posterior	Mn. Anterior	Mn. Posterior	Total
No. of Implant	26	108	8	112	254
No. of Bone loss	1	2	0	3	6
0’ bone level	21	92	6	84	203
+’ bone level	4	14	2	25	45

(2017 GAO group multi study)



Indication of CMI IS-II active vs. IS-III active

IS-II active

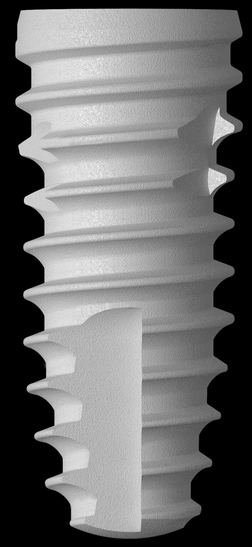
- Posterior maxilla

Soft bone area

Immediate placement

Immediate loading in the posterior maxilla

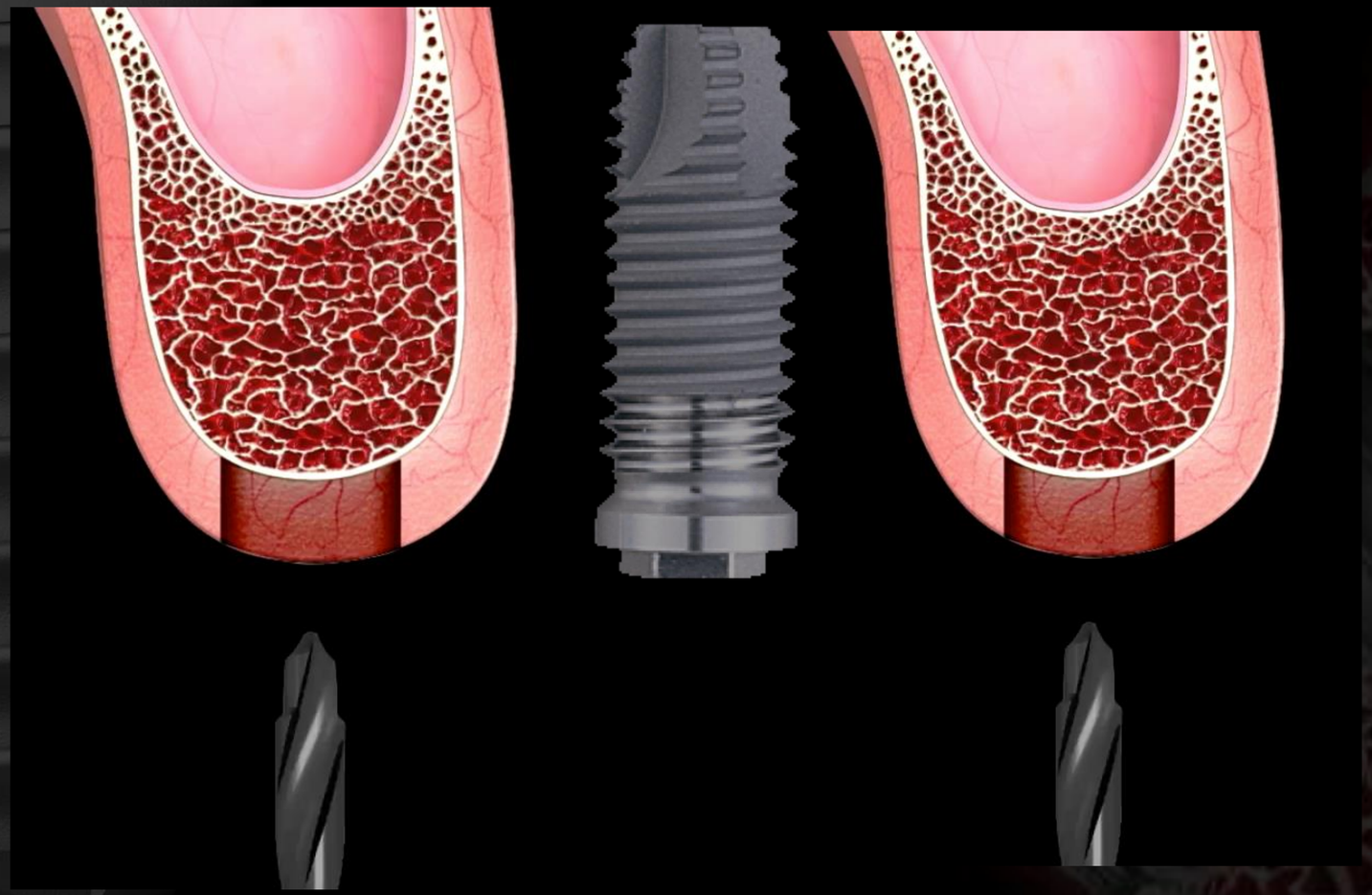
IS-III active



- All area
- Immediate loading
- Immediate placement

Implant Loading Protocol in the Maxillary Posterior Area

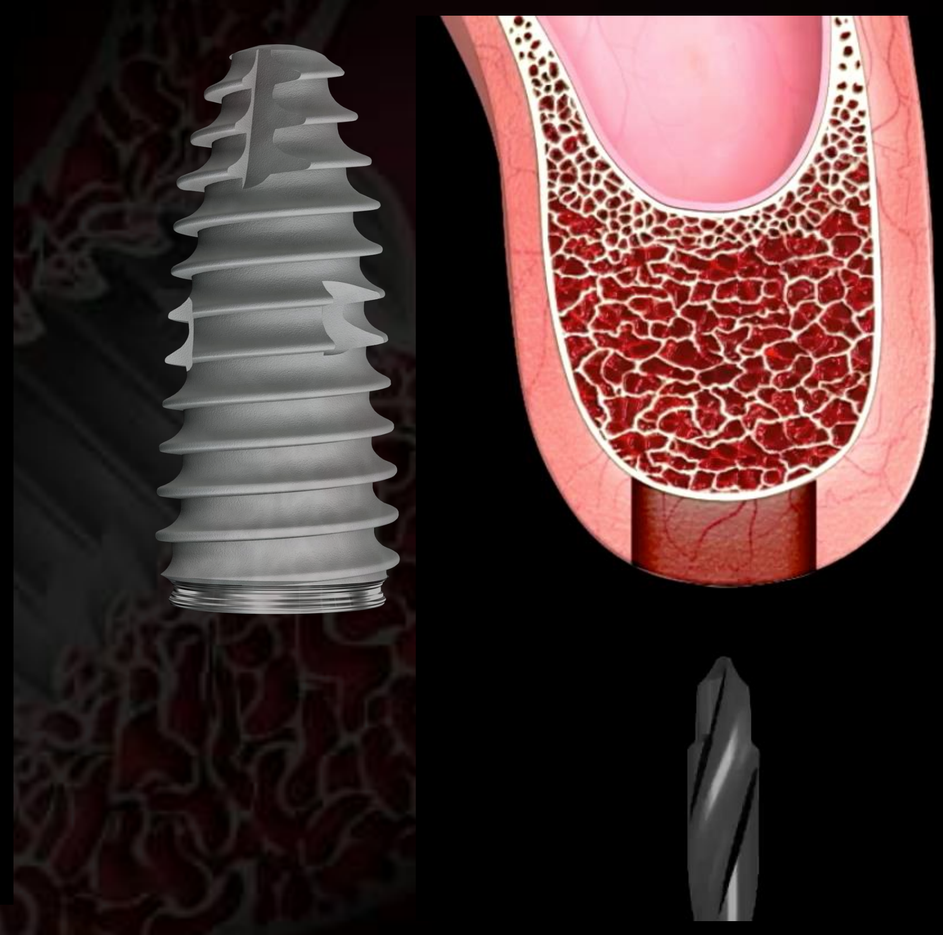
Problem of Straight Implant



Wide drilling

Narrow drilling

Advantage of Tapered Apex

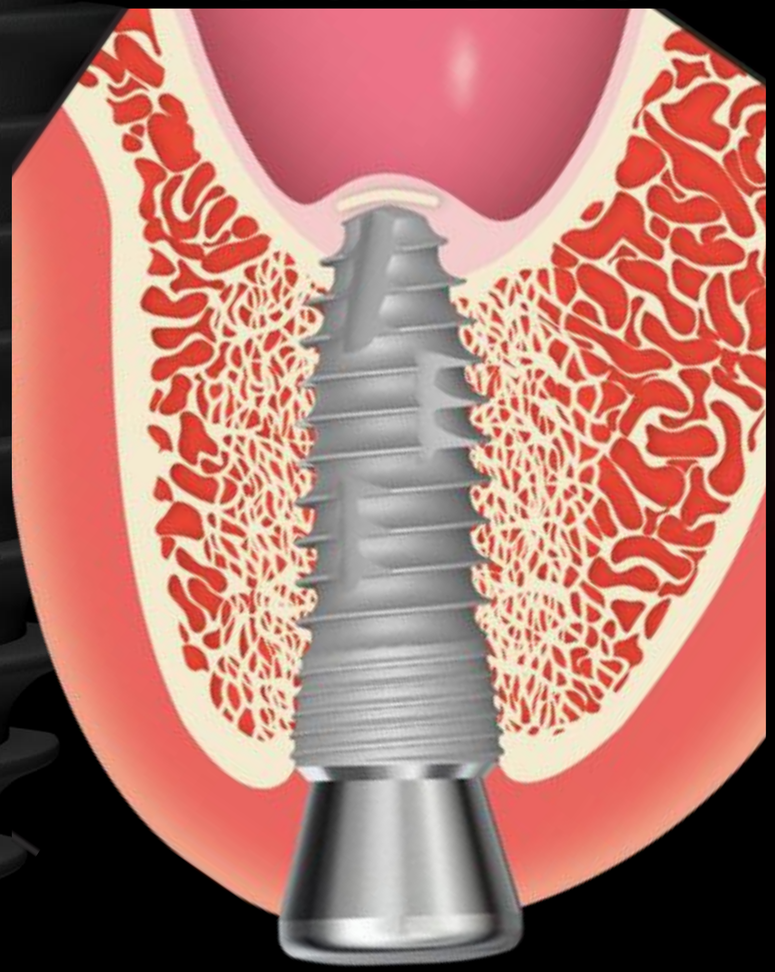


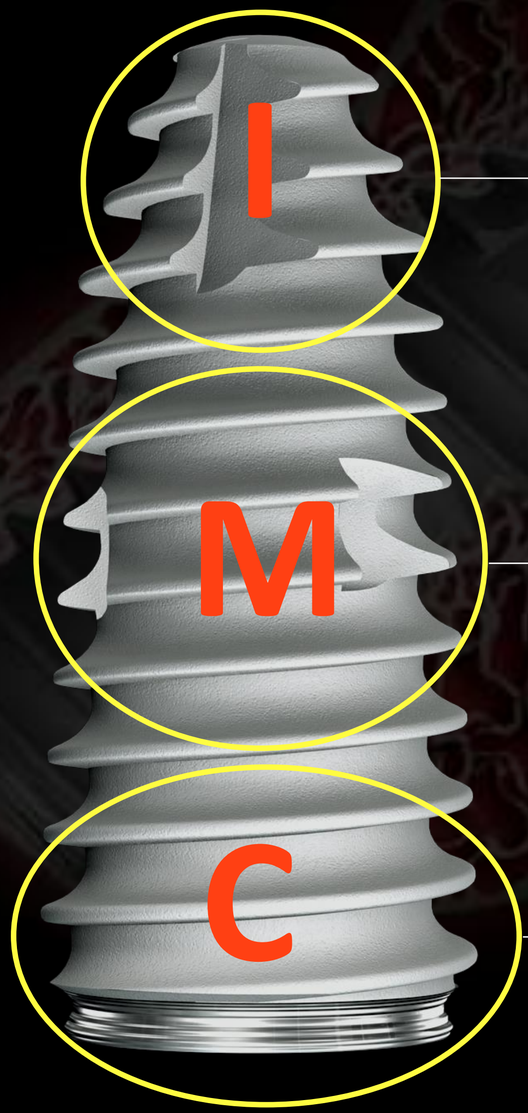
Narrow drilling

Heo's 'CMI' fixation

Sinus Book 2010 Well Pub.

Inferior Cortical Bone
of the Sinus





Apical Fixation

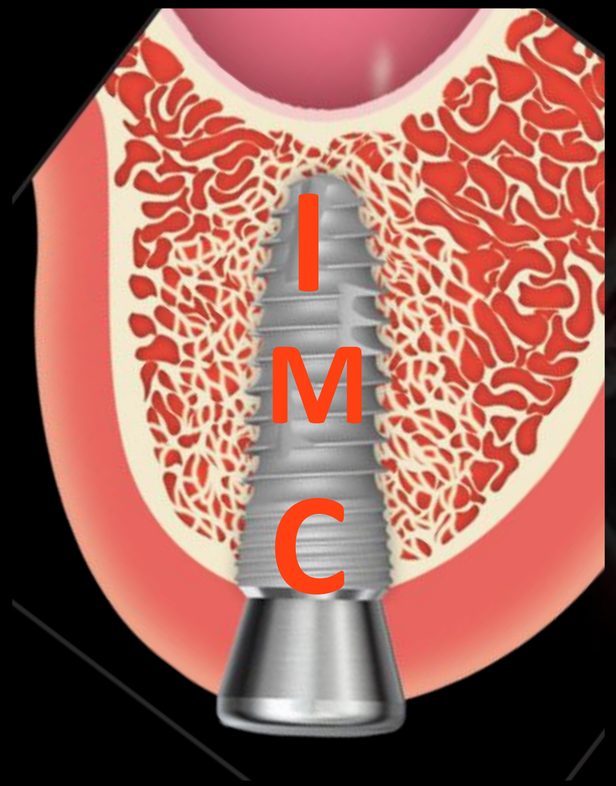
Middle Fixation

Coronal Fixation

CMI Fixation in the Posterior Maxilla

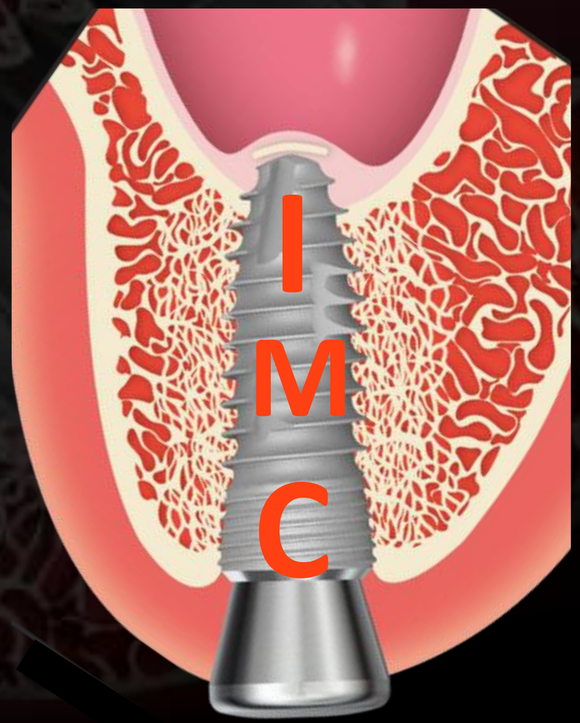
Class I

CMI Fixation

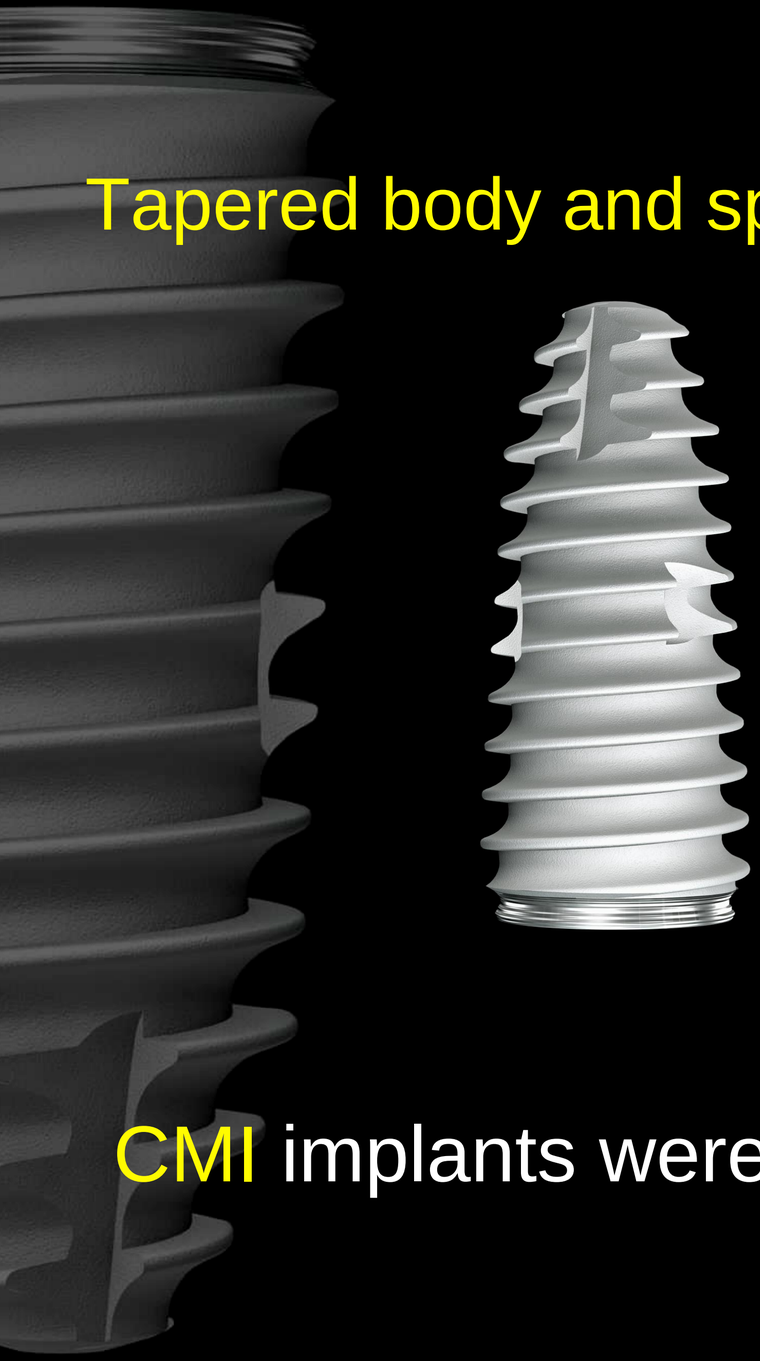


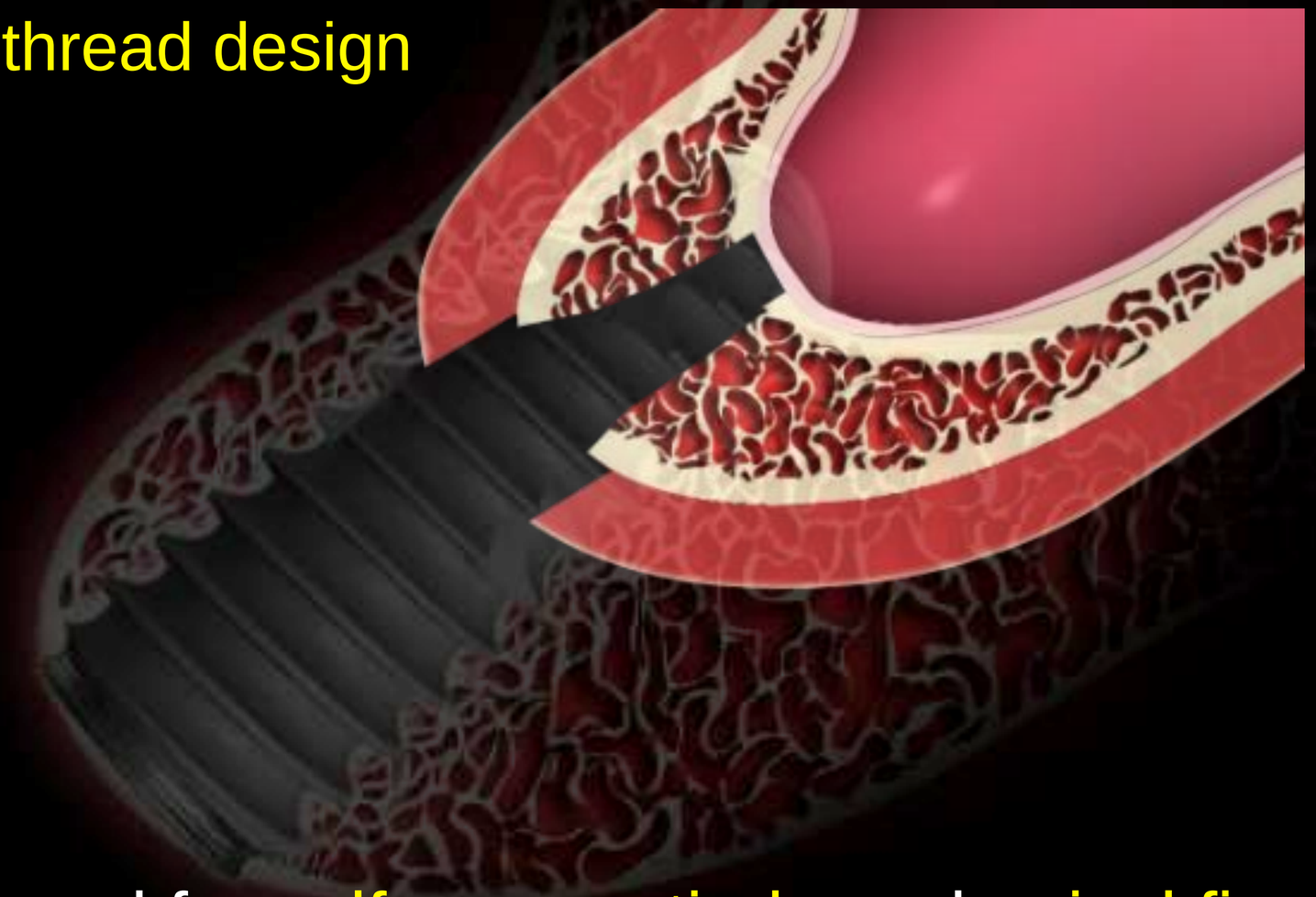
Class II

CMI Fixation



Tapered body and special thread design



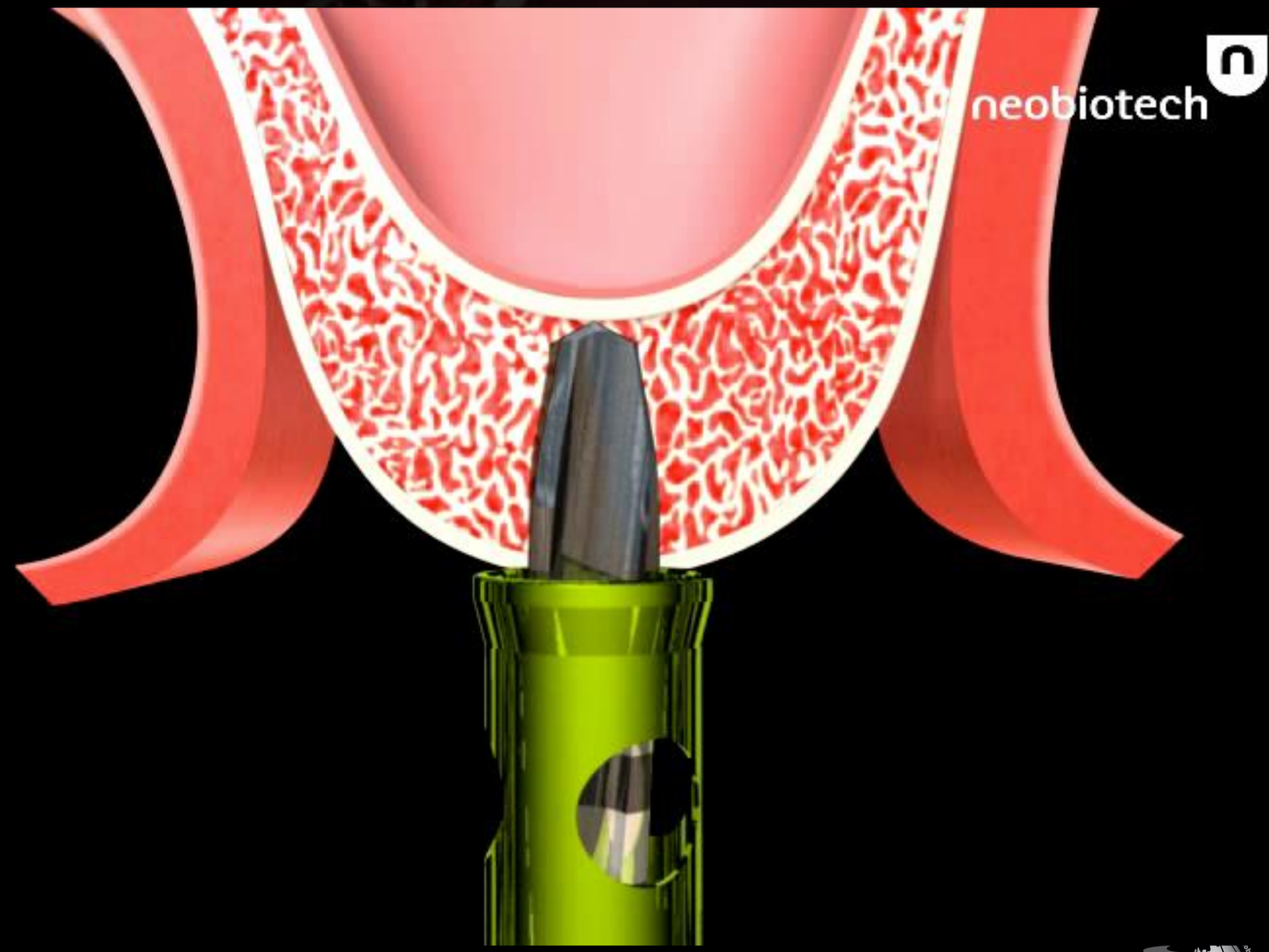


CMI implants were designed for self-compactiodn and apical fixation

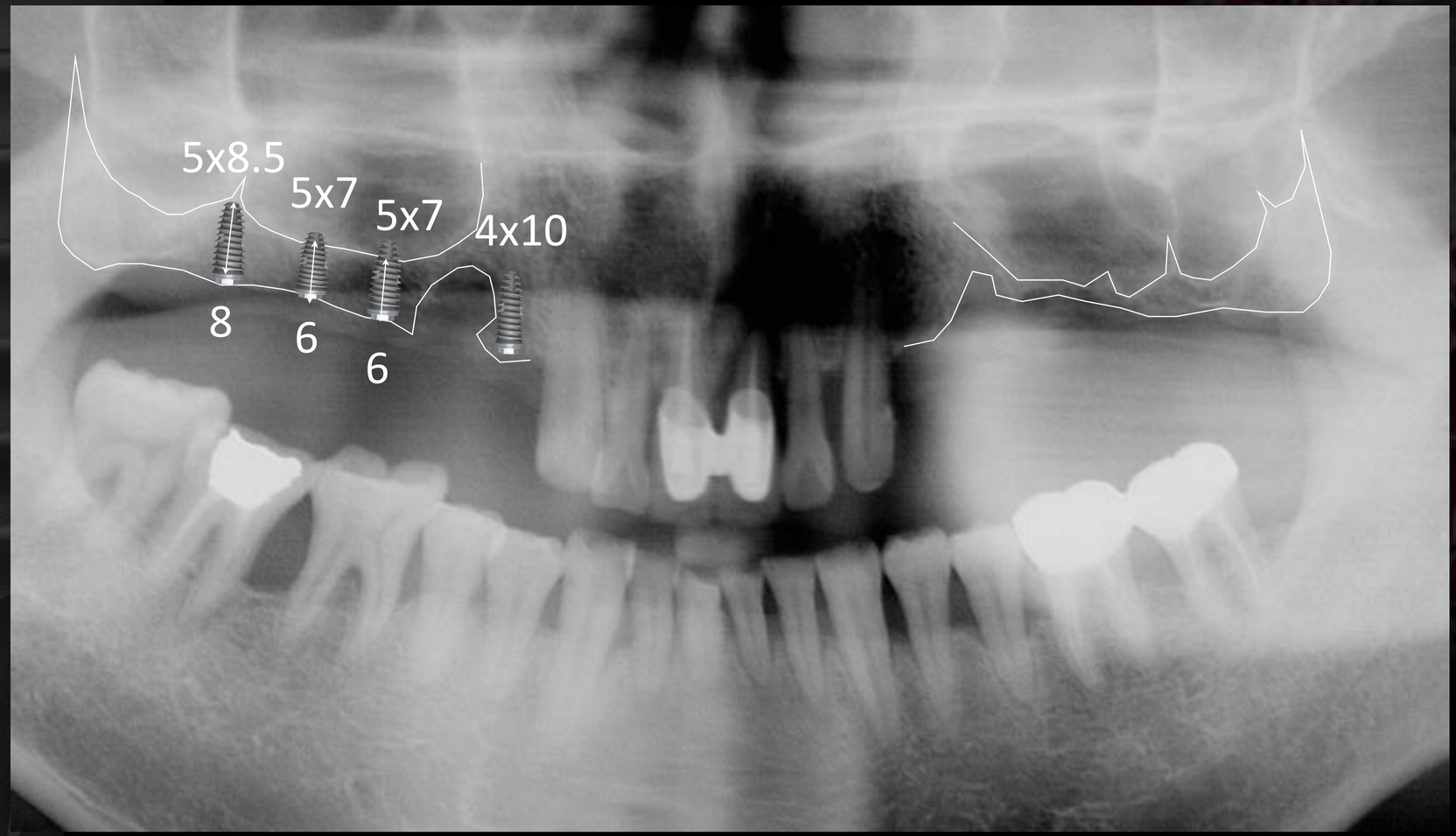
SCA Kit

was developed for ‘I’ Fixation
not only for sinus elevation.

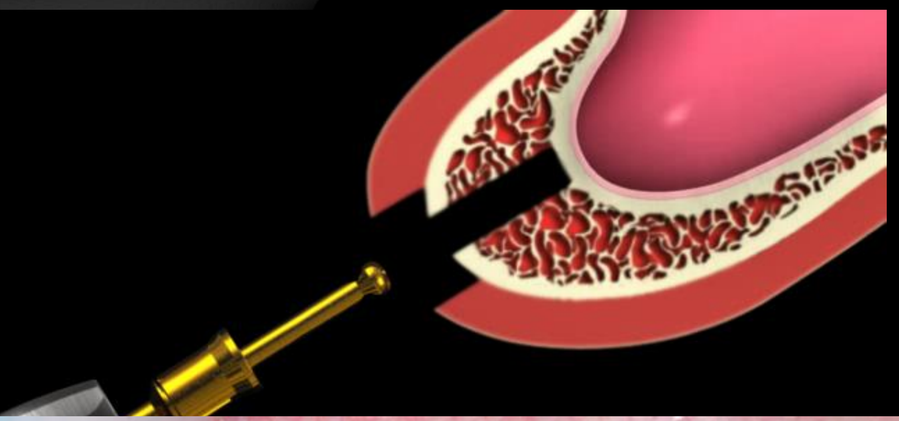
Sinus CrestalApproach



2 week Loading in 6mm bone with a Definitive Prosthesis



S-Reamer in SCA kit



07/20/2007

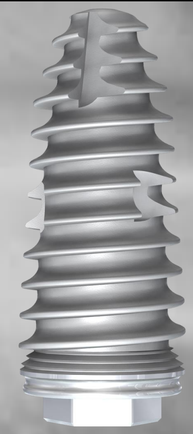
CMI

35Ncm

45Ncm

40Ncm

45Ncm



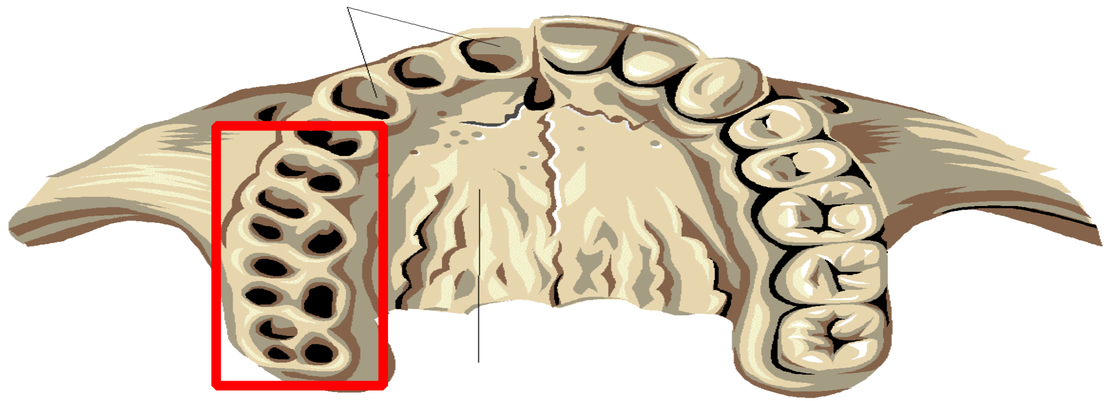
Final Pros in 2 weeks

08/04/2007

Final Pros in 2 weeks (08 April 2007)

10 yrs later (July 2016)

A Randomized Control Study on **4 Week Loading in the Posterior Maxilla**



30 **SLA active**

straumann

vs.

30 **CMI IS-II active®**

Neo Biotech
Satisfaction to Dentists

Clin Oral Implants Res. 2016 Aug;27(8):1017-25. doi: 10.1111/clr.12667. Epub 2015 Jul 30.

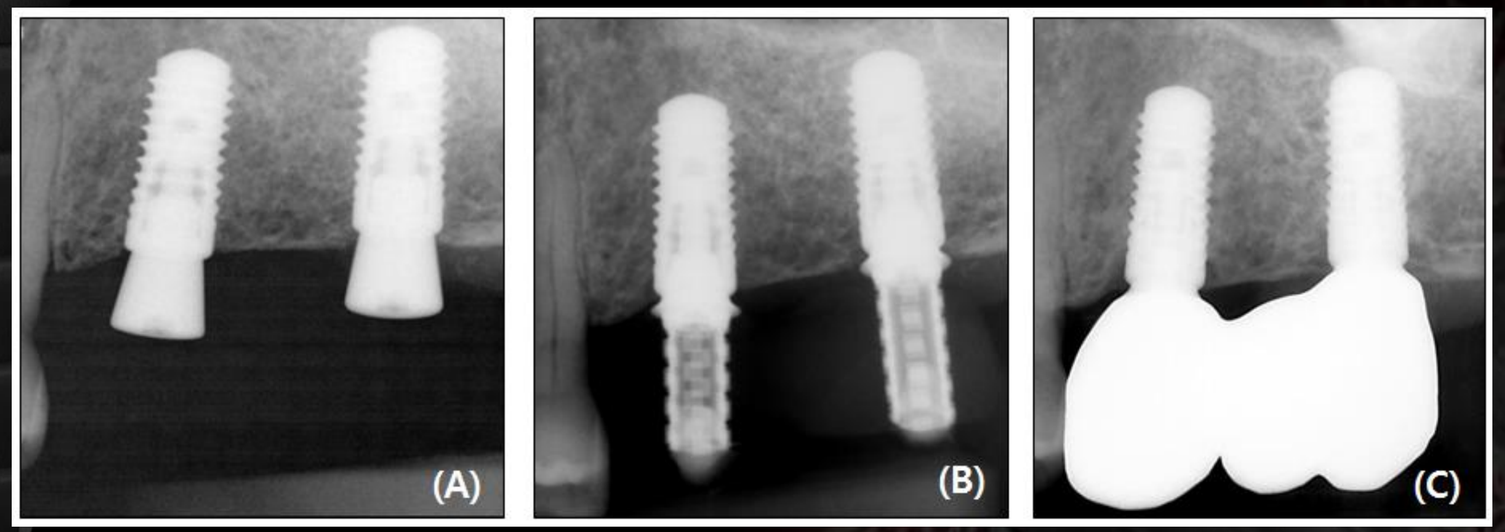
CLINICAL ORAL IMPLANTS RESEARCH

Hyo-Sook Ryu
Cheol Namgung
Young-Ku Heo
Jong-Ho Lee
Young-Jun Lim

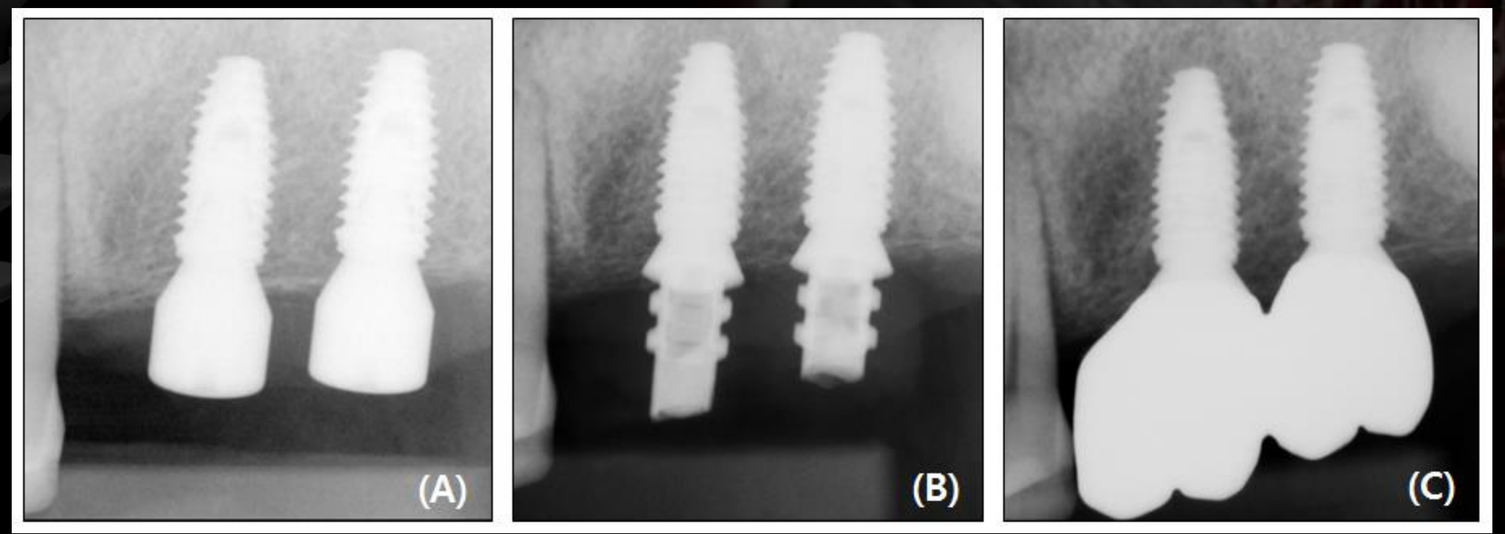
Early loading of splinted implants supporting a two-unit fixed partial denture in the posterior maxilla: 13-month results from a randomized controlled clinical trial of two different implant systems

Clin Oral Implants Res. 2016 Aug;27(8):1017-25. doi: 10.1111/clr.12667. Epub 2015 Jul 30

SLActive Control



CMI IS-II active Test



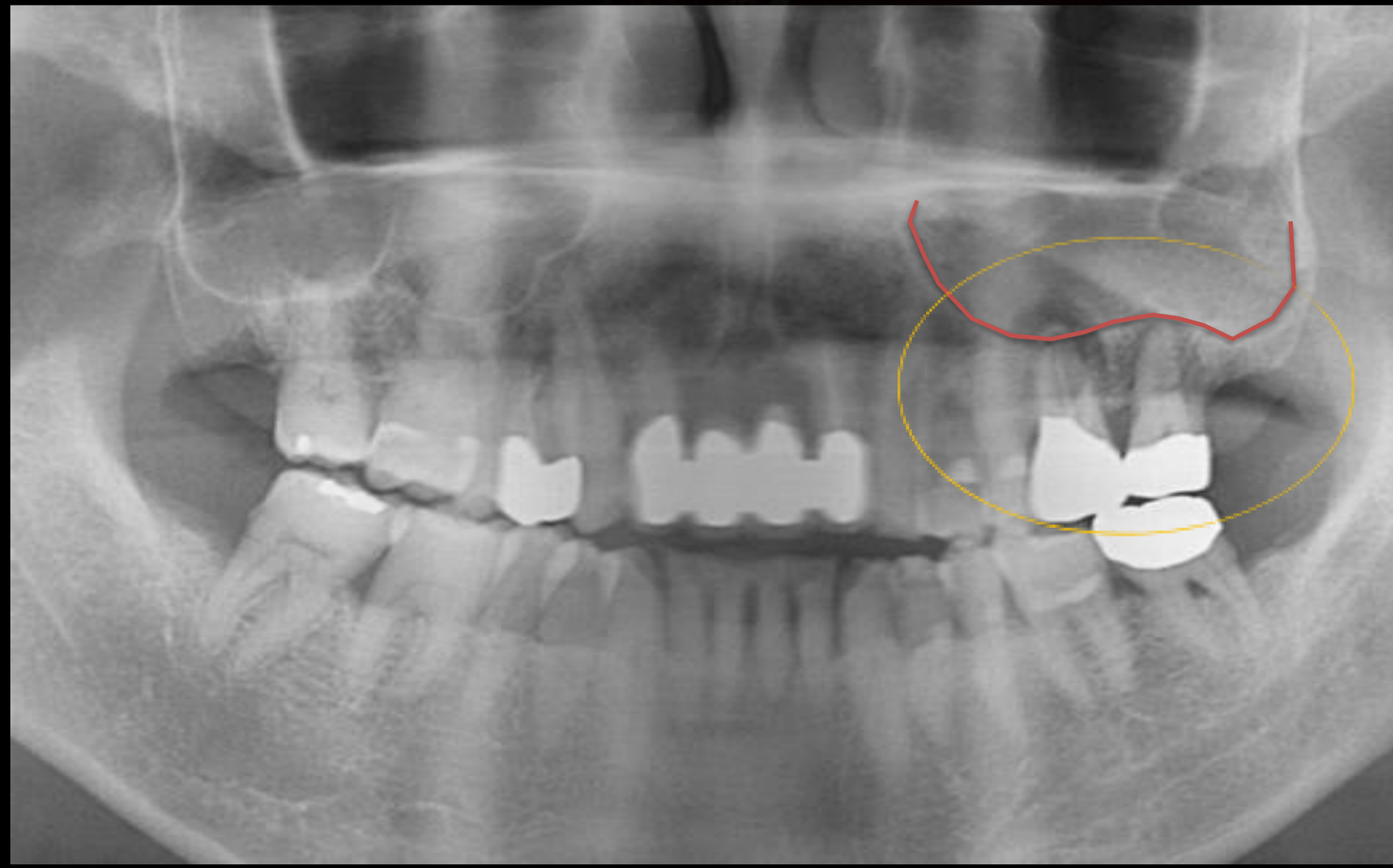
Periapical radiograph

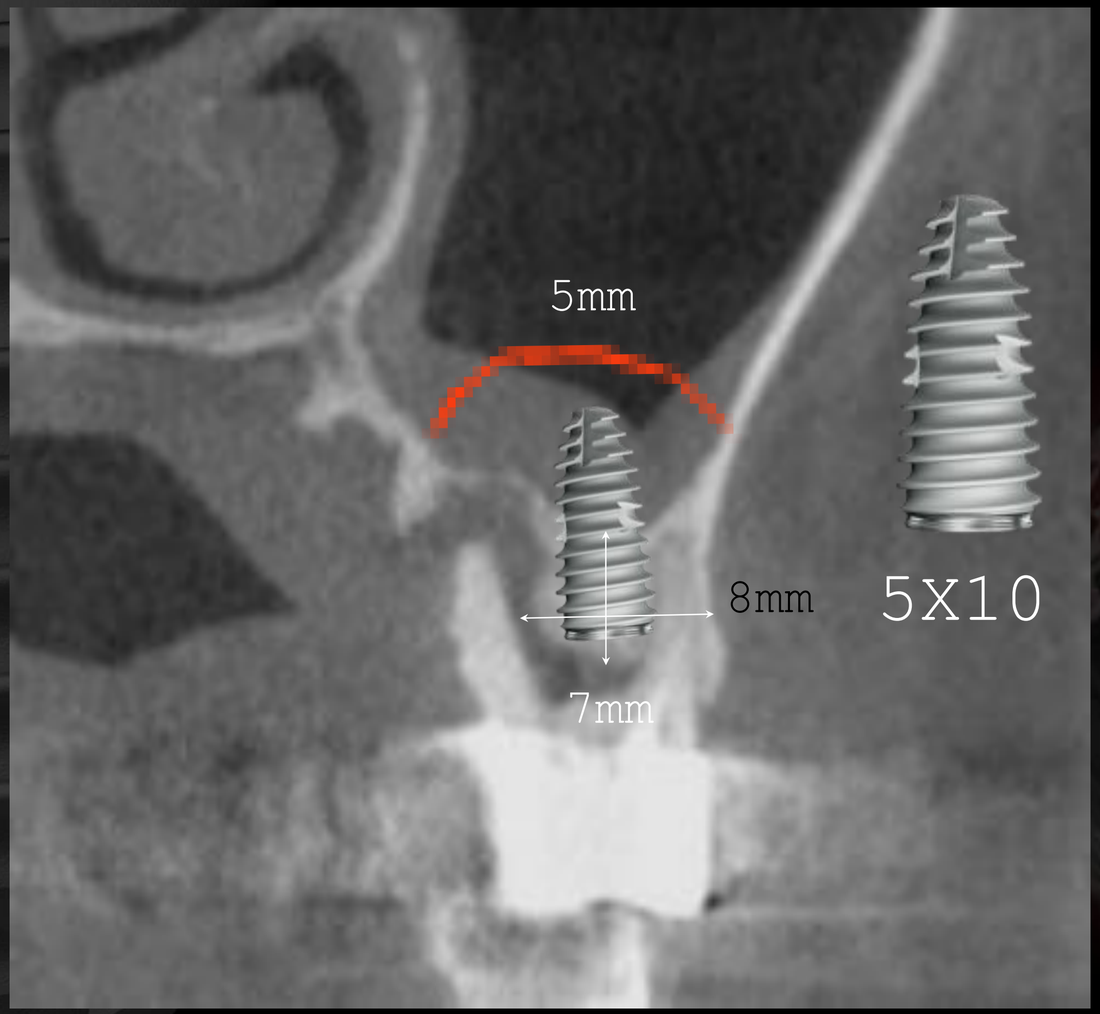
(A) At surgery

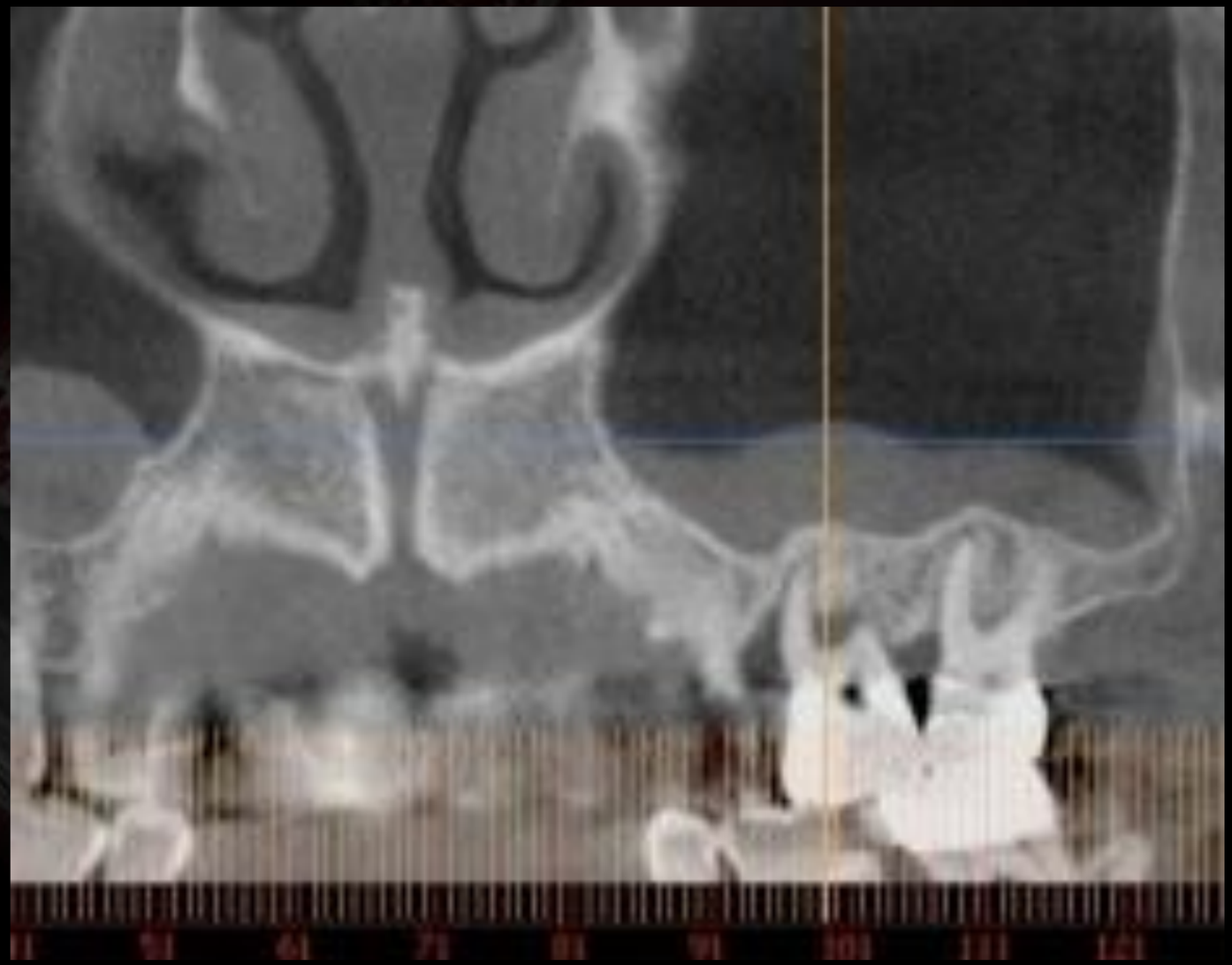
(B) 4 weeks

(C) 13 months

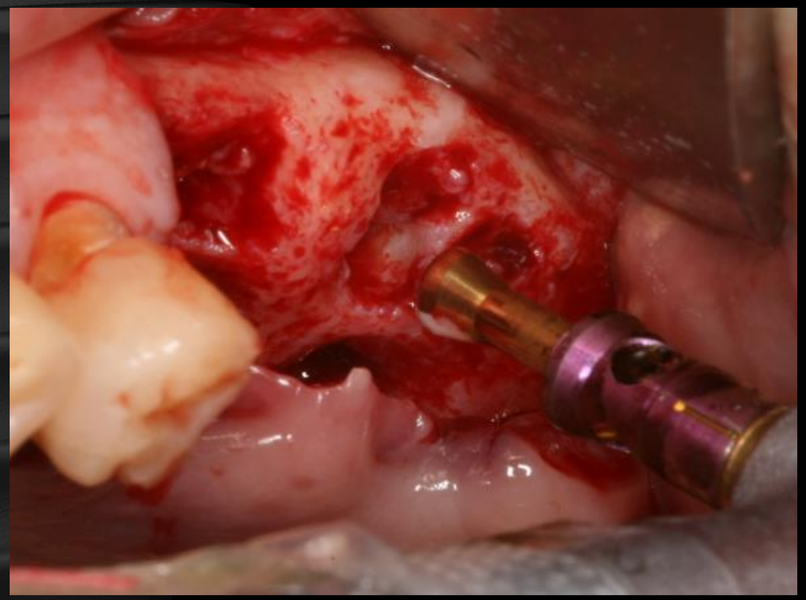
Maxillary Sinus Case: 4 week Loading on Extraction Socket

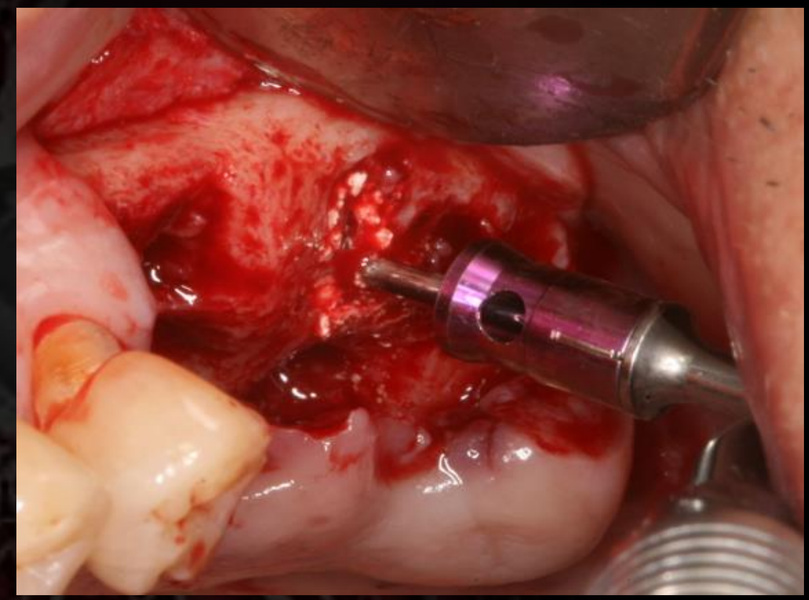


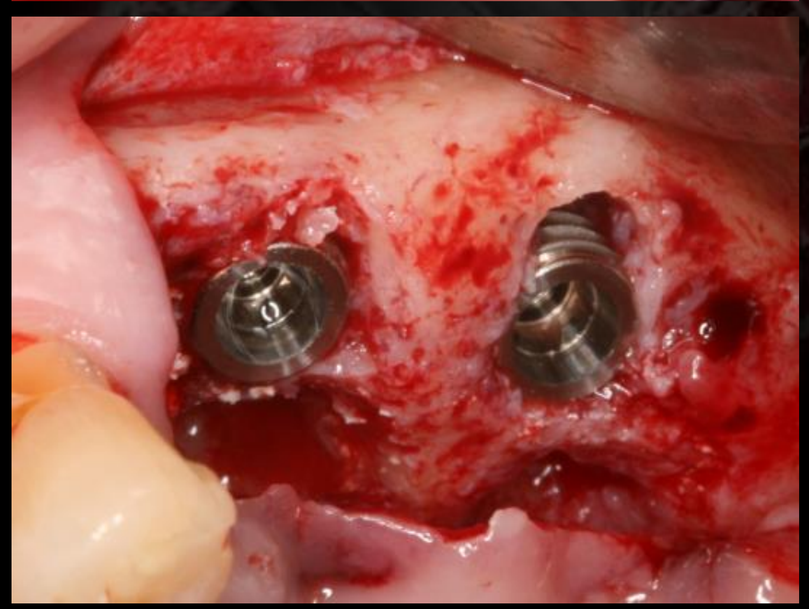

5mm
8mm
7mm
5X10

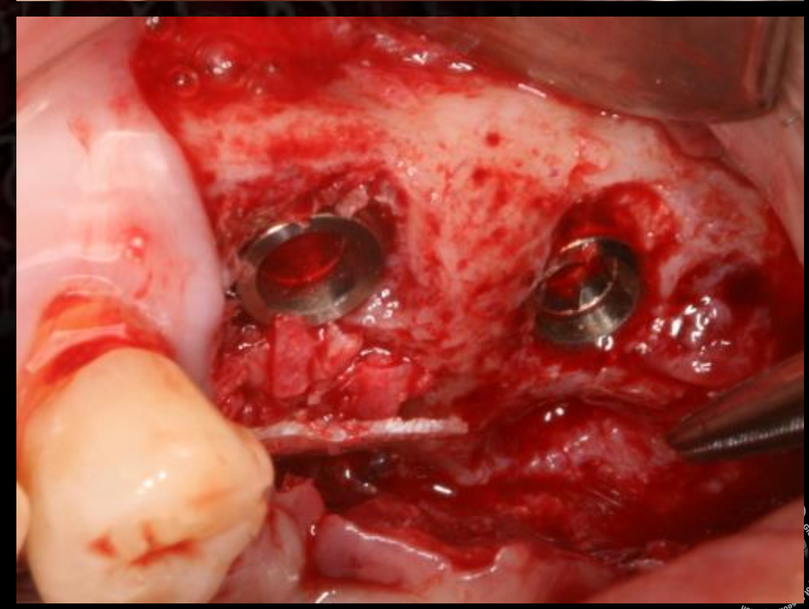


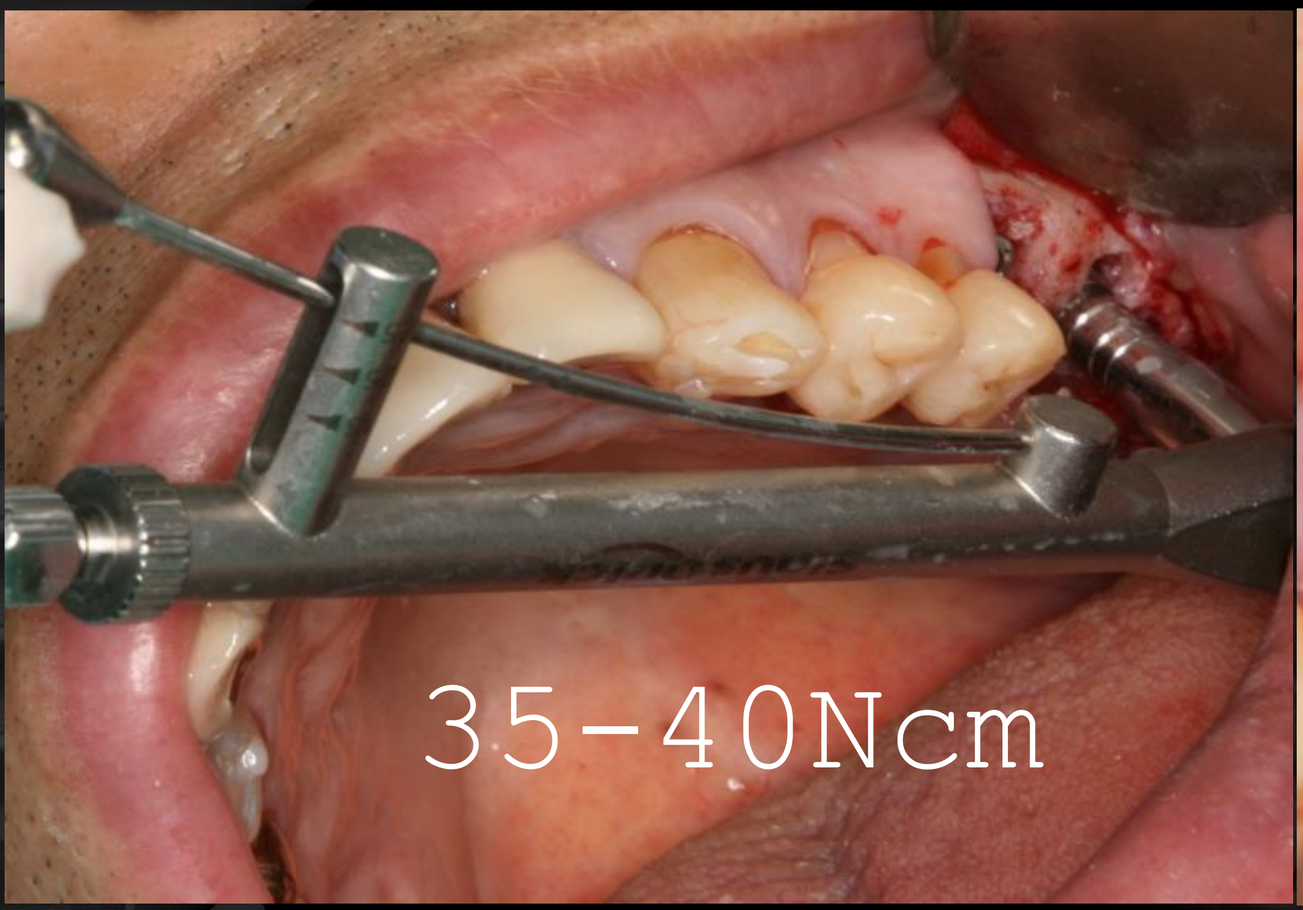
Crestal bone graft with S-reamer in SCA kit







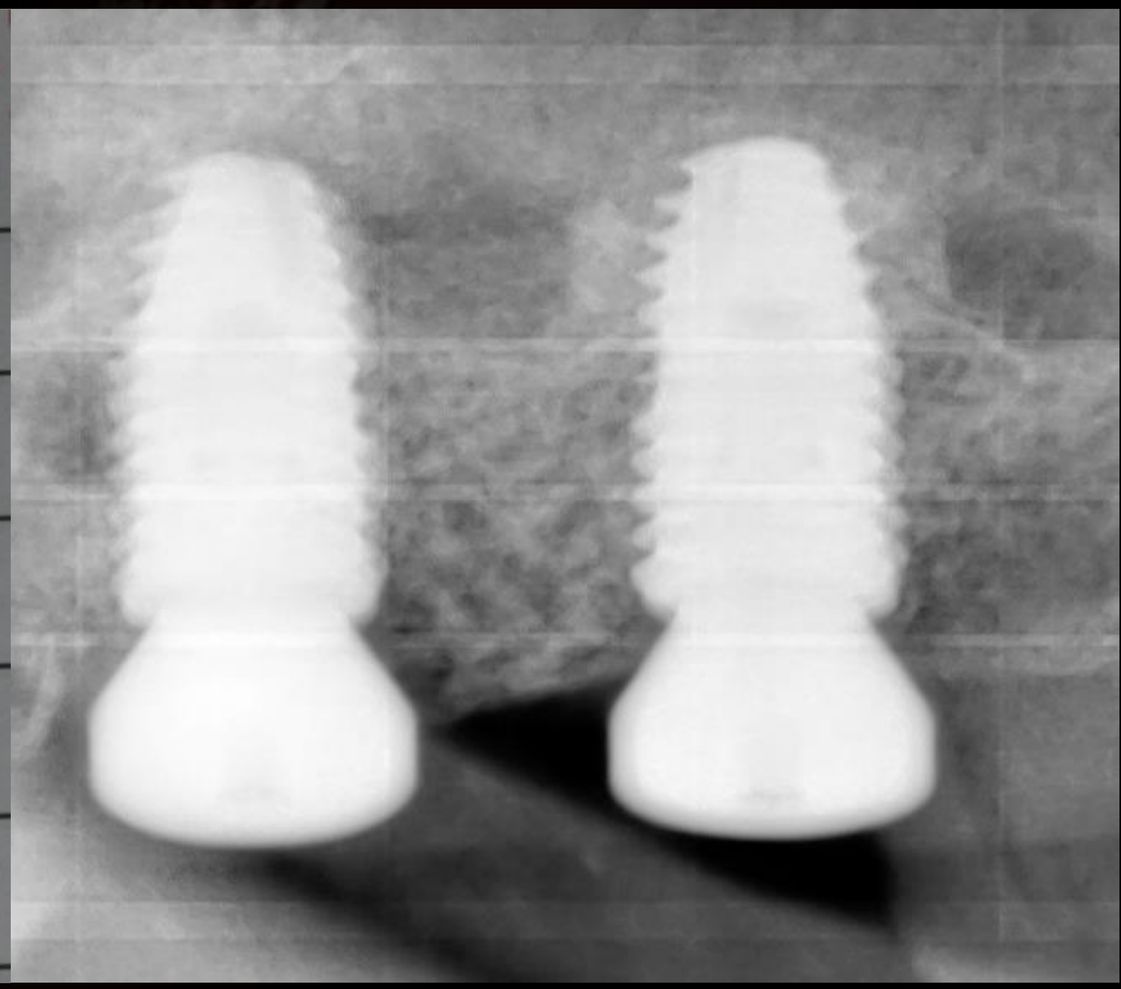



35-40Ncm


2011/07/27

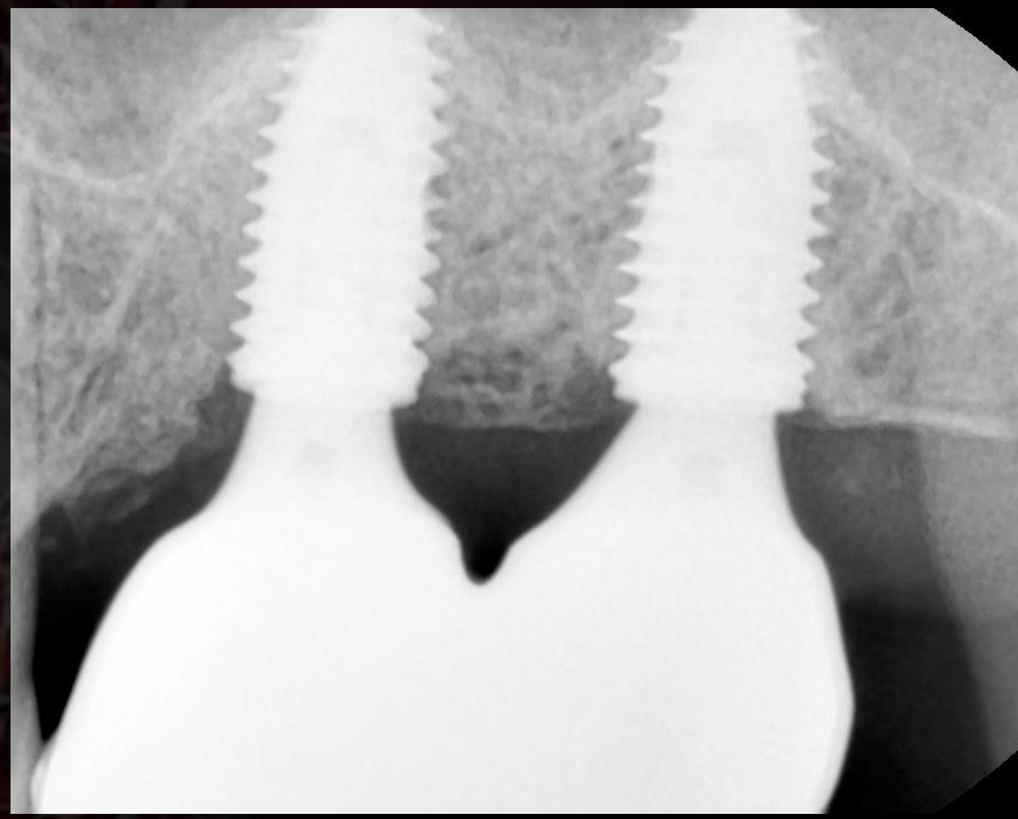
ame:
ate: 2011. 07. 20
mplant No:

plant Site	#26	#27		
pe&Size	BIS 5010	BIS 5010		
ne Density	D320	D320		
al Stability /F/P	40	40	— self tapping	
gry Type ,S)	N/S	N/S		

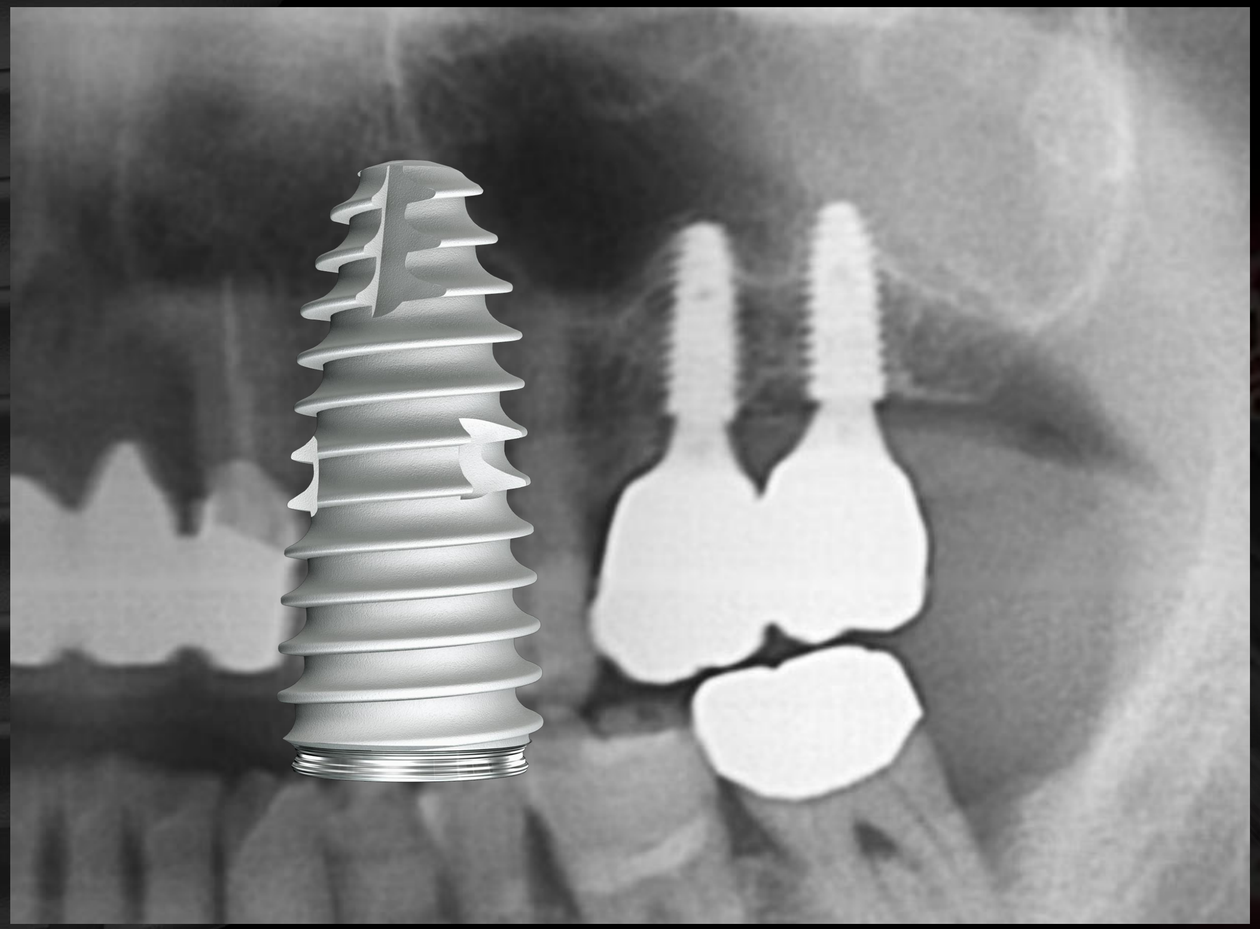


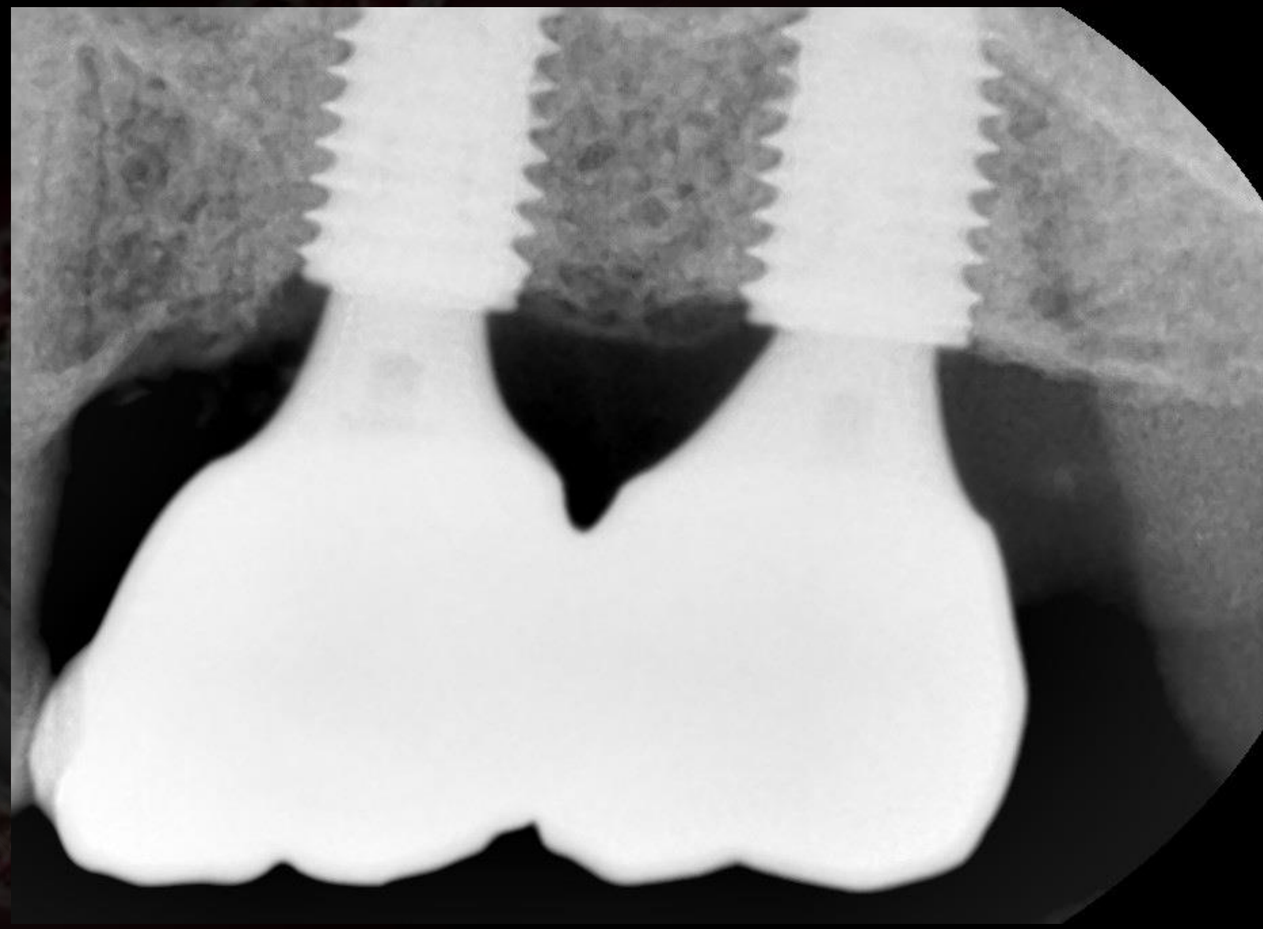
4week Loading with a provisional restoration

Final Restoration in 6 months

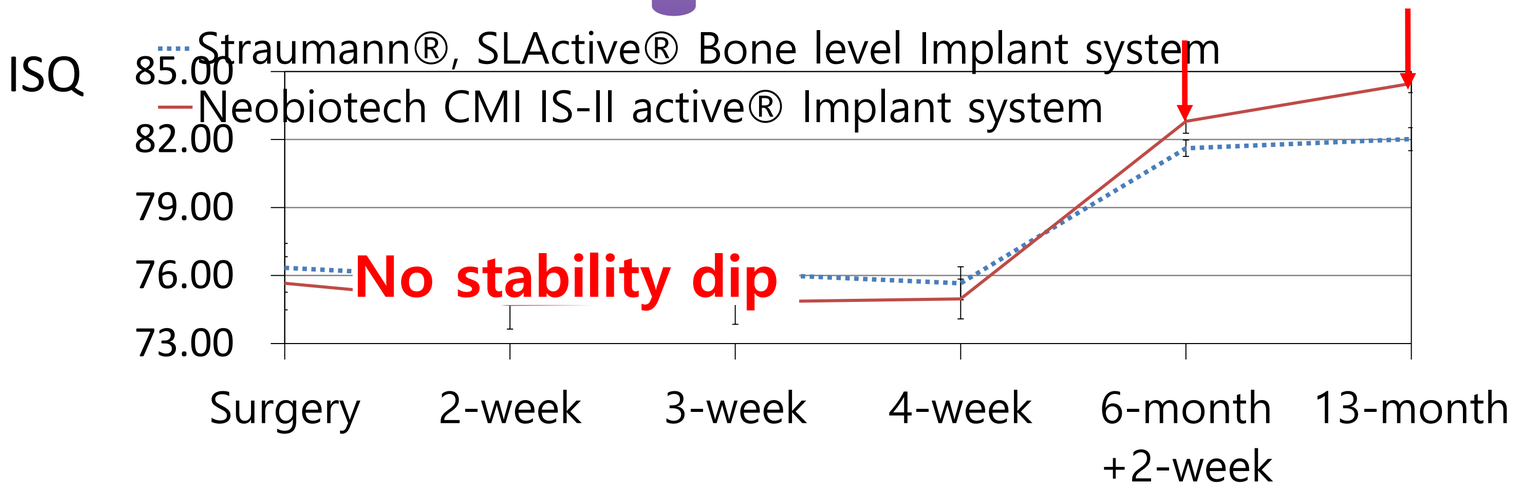


May 2018 (7 yrs follow-up)





Secondary stability – ISQ pattern



	N	Surgery	2-week	3-week	4-week	6-month + 2-week	13-month
Straumann®, SLActive® Bone level Implant system (Mean ± SD)	*30*	*76.34 ± 5.89*	*75.84 ± 5.52*	*76.10 ± 4.48*	*75.66 ± 3.98*	*81.62 ± 2.00*	*82.02 ± 2.75*
Neobiotech CMI IS-II active® Implant system (Mean ± SD)	*30*	*75.66 ± 6.41*	*74.73 ± 5.91*	*74.83 ± 5.38*	*74.97 ± 4.80*	*82.80 ± 2.84*	*84.47 ± 2.14*
P-value between two subsequent visits*			*0.334*	*0.716*	*0.534*	*0.000**	*0.000**

**The P-values were calculated using the two-way repeated measures ANOVA.*
ISQ, implant stability quotient; SD, standard deviation

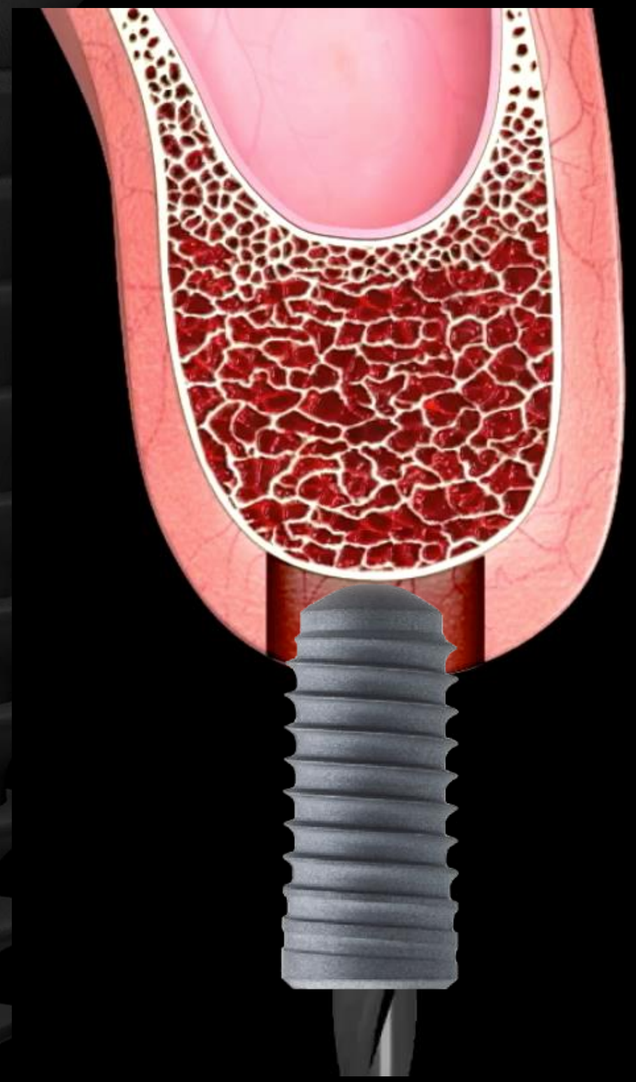
The overall 13-month success rates were 100%.

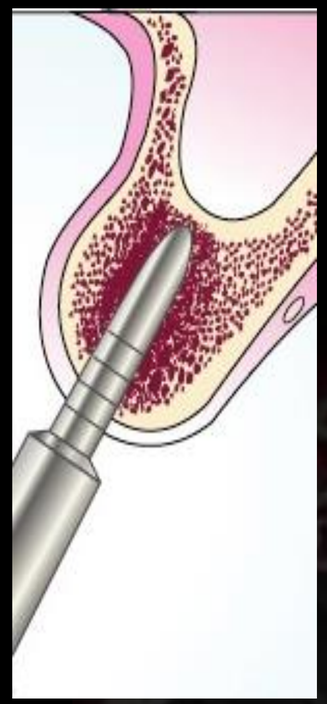
		Type of implant								
Duration		*Straumann®, SLActive® Bone level Implant system* 				*Neobiotech CMI IS-II active® Implant system* 				*P-value**
	Area	*N*	*Bone loss: Mean ± SD (mm)*			*N*	*Bone loss: Mean ± SD (mm)*			
During the 4 weeks after surgery	*Proximal*	*30*	*0.35*	*±*	*0.78*	*30*	*0.41*	*±*	*0.84*	*0.935*
	Distal	*30*	*0.42*	*±*	*0.85*	*30*	*0.50*	*±*	*0.92*	*0.744*
	Avg	*30*	*0.38*	*±*	*0.81*	*30*	*0.45*	*±*	*0.87*	*0.870*
13-month follow-up	*Proximal*	*30*	*1.09*	*±*	*0.89*	*30*	*0.69*	*±*	*1.48*	*0.161*
	Distal	*30*	*0.86*	*±*	*0.87*	*30*	*0.53*	*±*	*1.47*	*0.285*
	Avg	*30*	*0.98*	*±*	*0.88*	*30*	*0.61*	*±*	*1.45*	*0.187*

The P-values were calculated using the Mann–Whitney test.
Area, the radiographic measurement area for calculation of marginal bone loss; Avg, the average value of proximal and distal bone loss; SD, standard deviation.

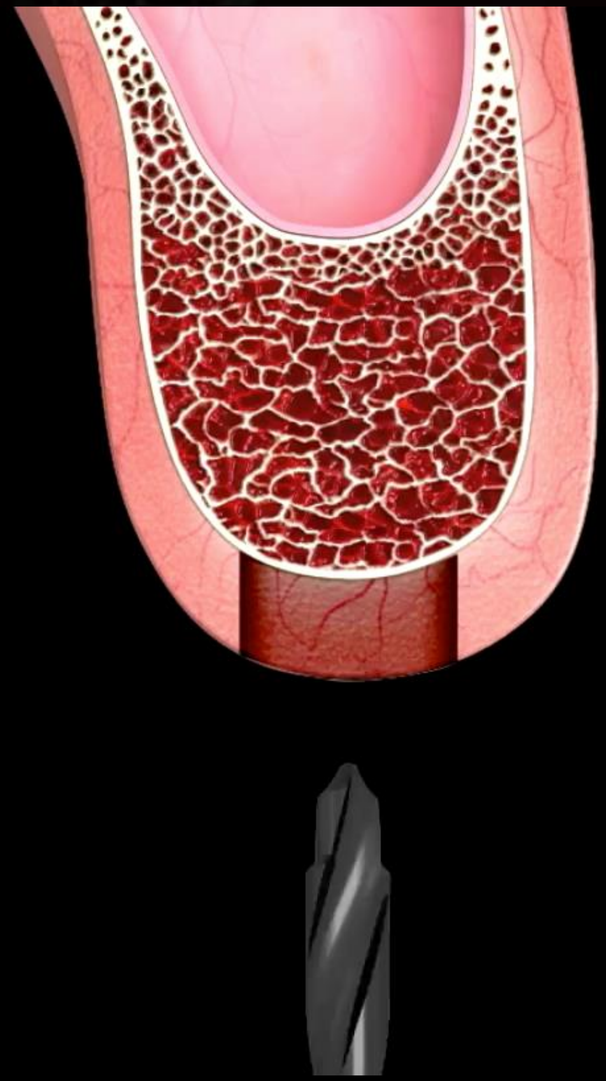
active

Straumann



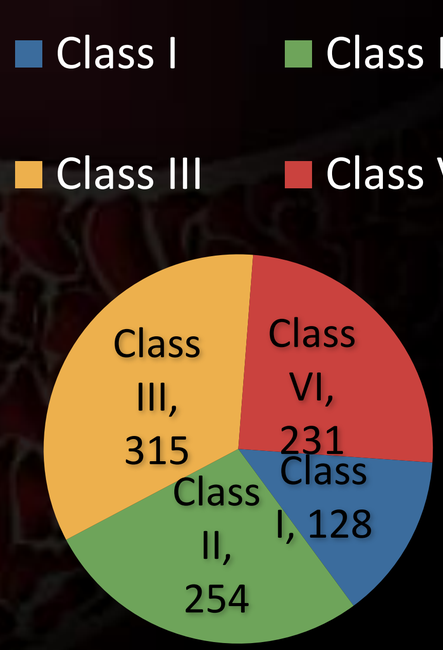


Neobiotech



8 year results in Sinus Area

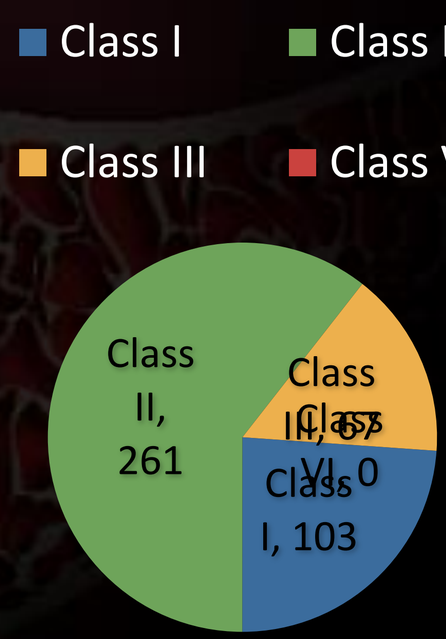
	Class I	Class II	Class III	Class VI	Total
No. of Implant	128	254	315	231	928
Fail	3	0	1	1	5
Success rate	99.7	100.0	99.7	99.6	99.5



(2010~2018 GAO group multi study)

8 year Result of
Immediate/Early Loading in the Sinus Area

	Class I	Class II	Class III	Class VI	Total
No. of Implant	103	261	67	0	431
Fail	2	1	2	0	5
Success rate	98.1	99.6	97.0	-	98.8



(201~2018 GAO group multi study)

Take Home Message

Ideal CMI Fixation by C pretapping and MI selfcompaction

1. Minimize amount of ostogetnic & osteolytic bone remodeling by causing minimum bone damage

2. Minimize/Eliminate the stability dip

3. Prevent Compression Necrosis of bone and over torque due to passive fit

4. Establish ideal MI fixation by selfcompaction

5. Achieve adequate primary stability

6. Reduce unknown implant failure Rate