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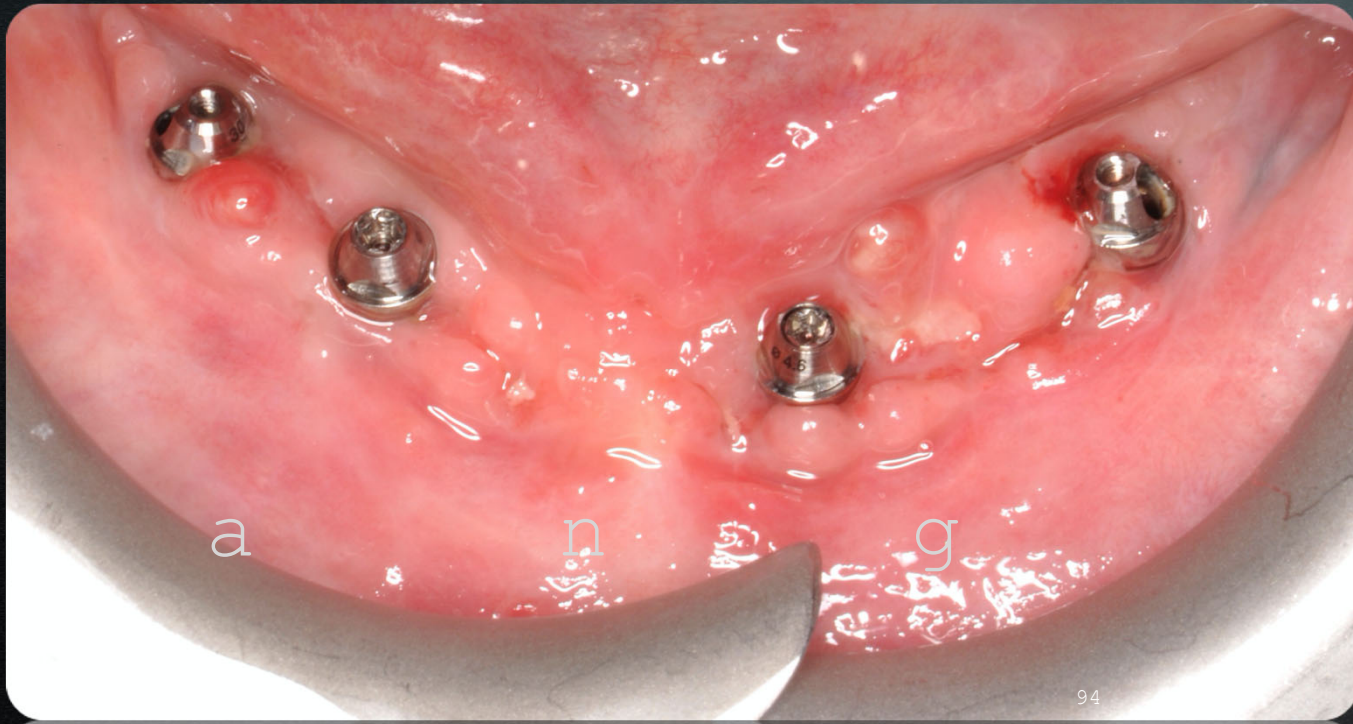
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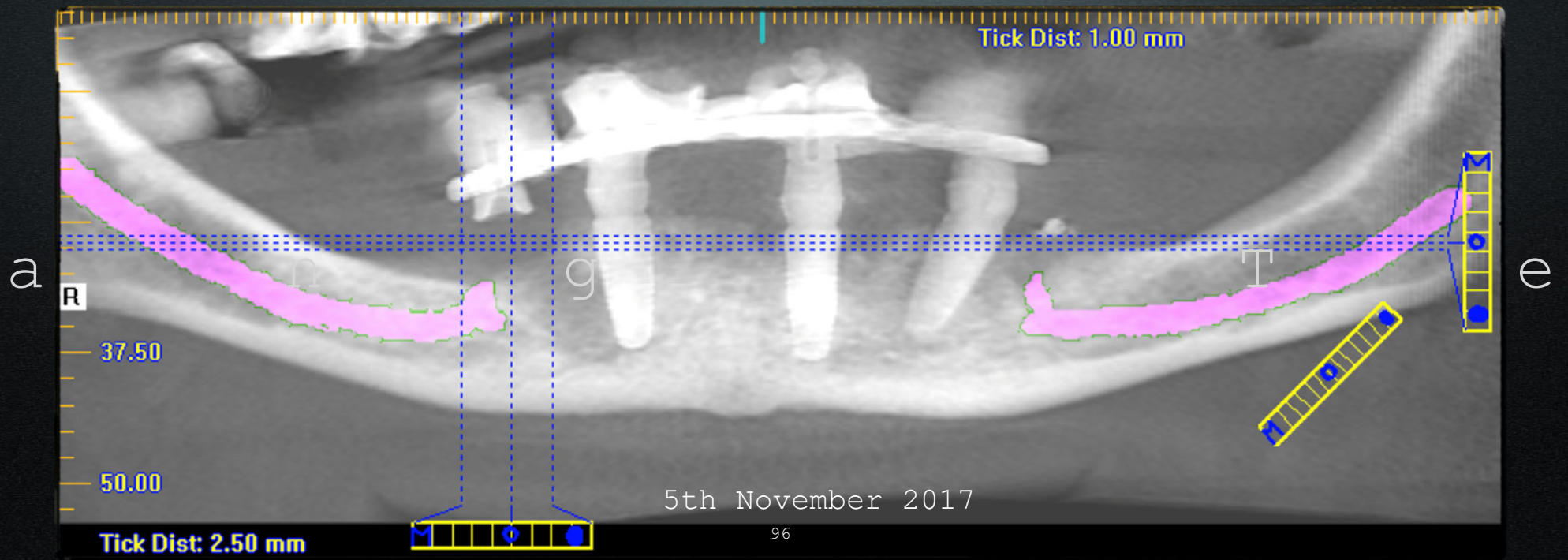




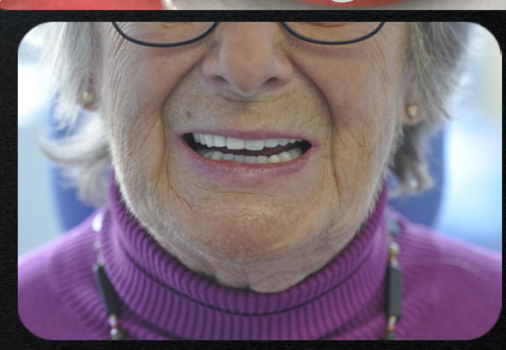
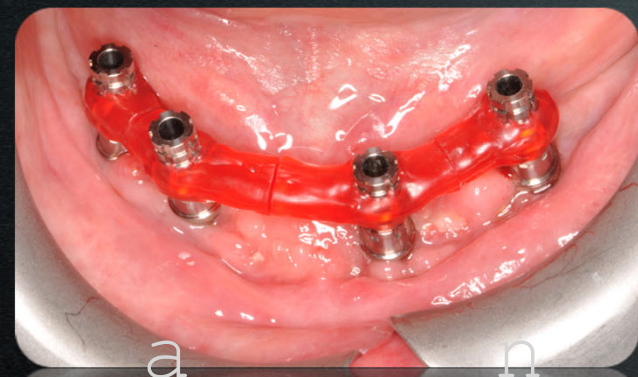




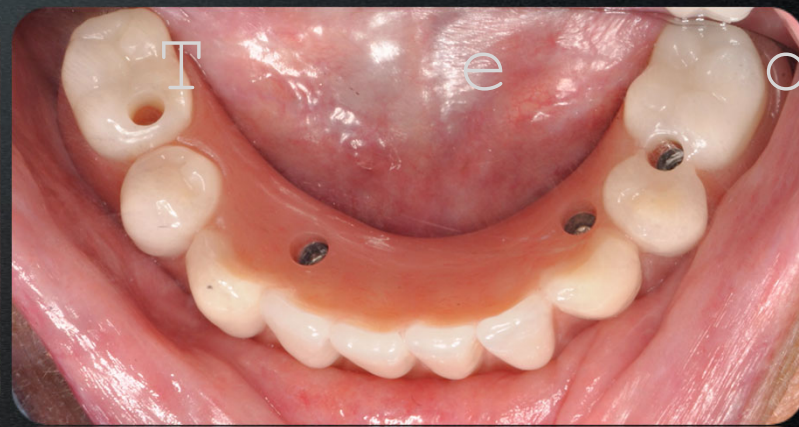
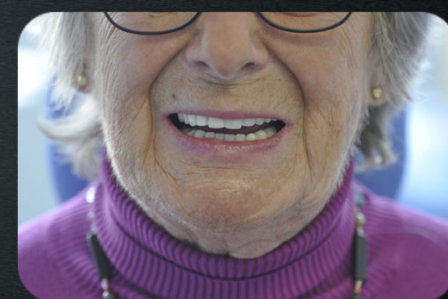
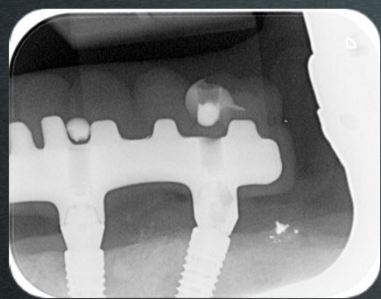
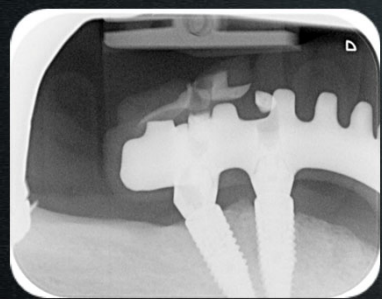
Keep calm & carry on







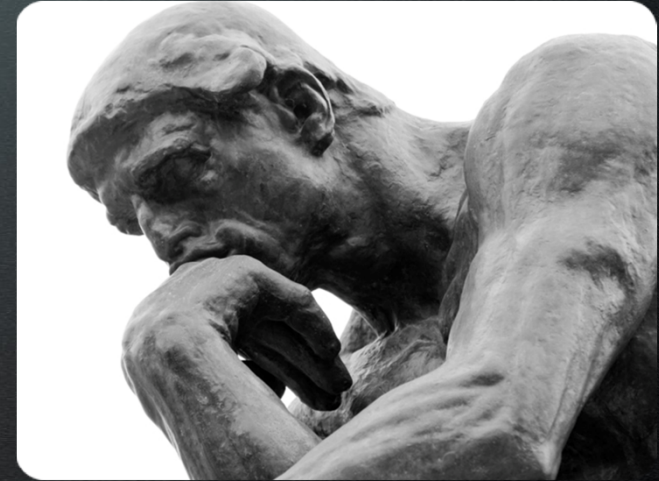






## Lesions learned

- Consider occlusal equilibration or create multiple even contact before treatment.
- Overerupted opposing tooth may pose a problem.
- Occlusal relief in such area may not be effective.
- Using SLActive implants is helpful in demanding clinical cases.



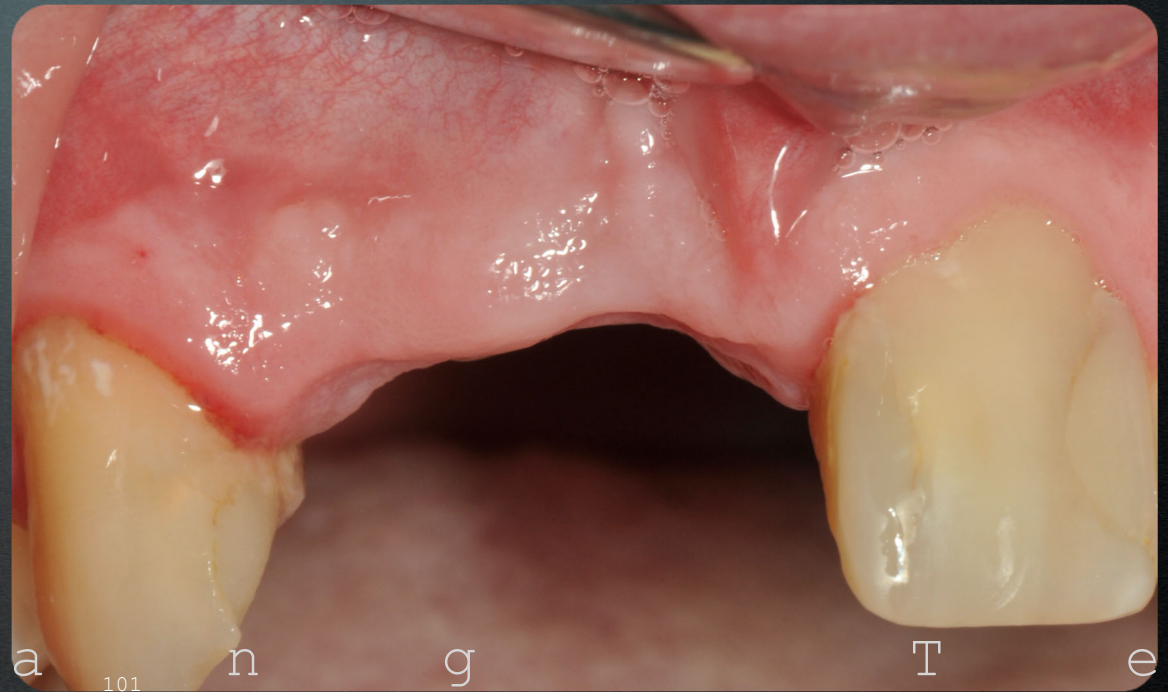


Compromised aesthetics !!!!!



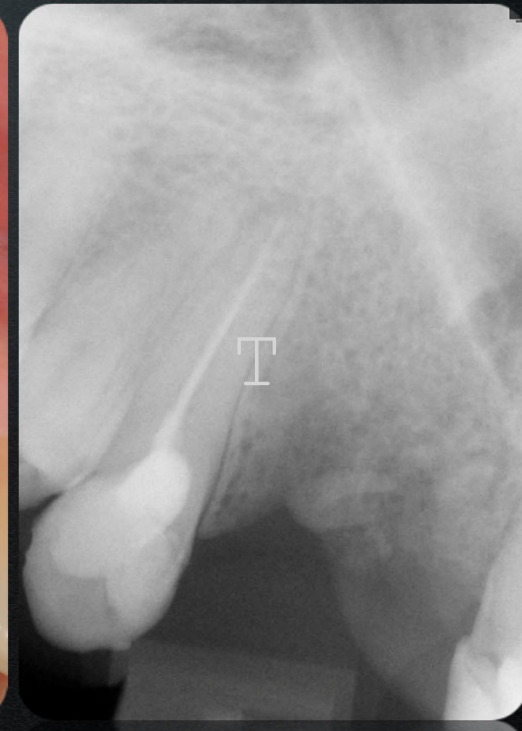
### Clinical Case 9 (Dec. 2011)

- Healthy 30 year old Caucasian gentleman (Julijus)
- Main complaint: missing 11&12
- Non Smoker
- Oral hygiene: unsatisfactory
- Low lip line
- Medium Biotype
- Class I incisal relationship
- Inadequate bone width
- Minor vertical bone loss

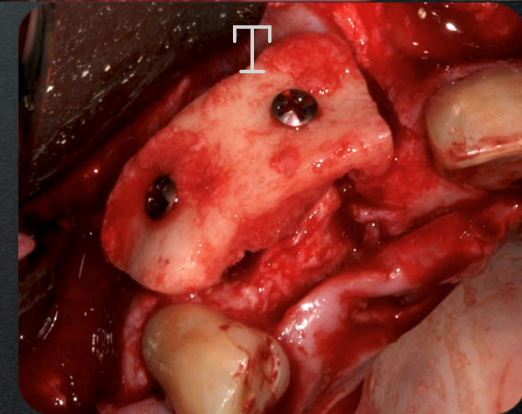
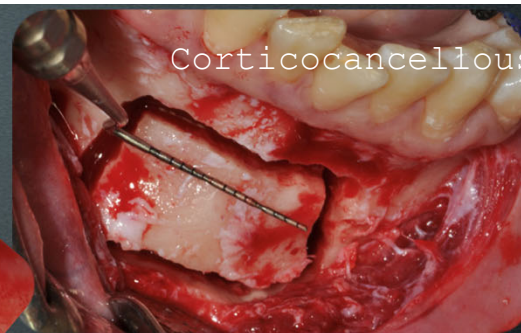
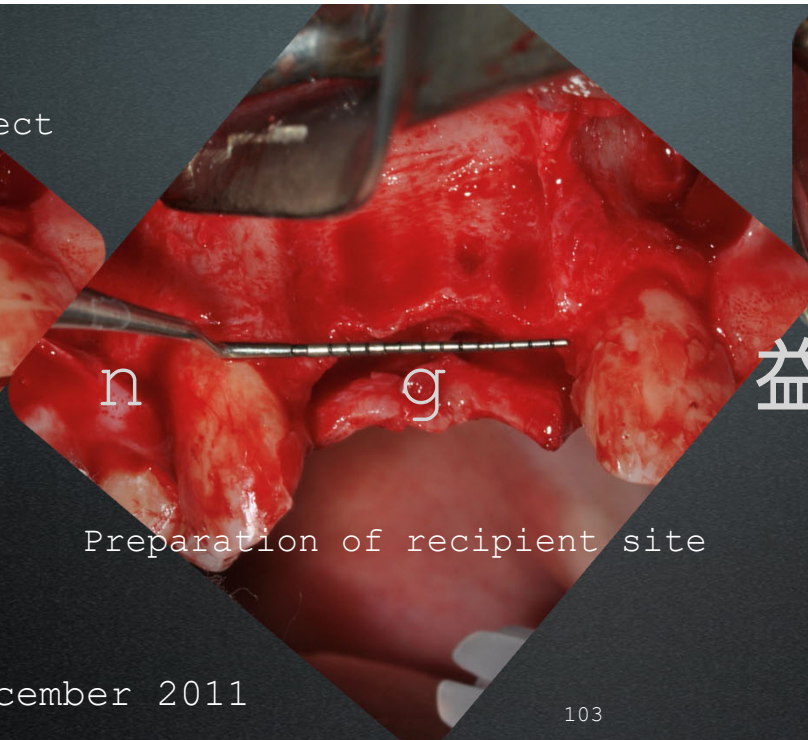
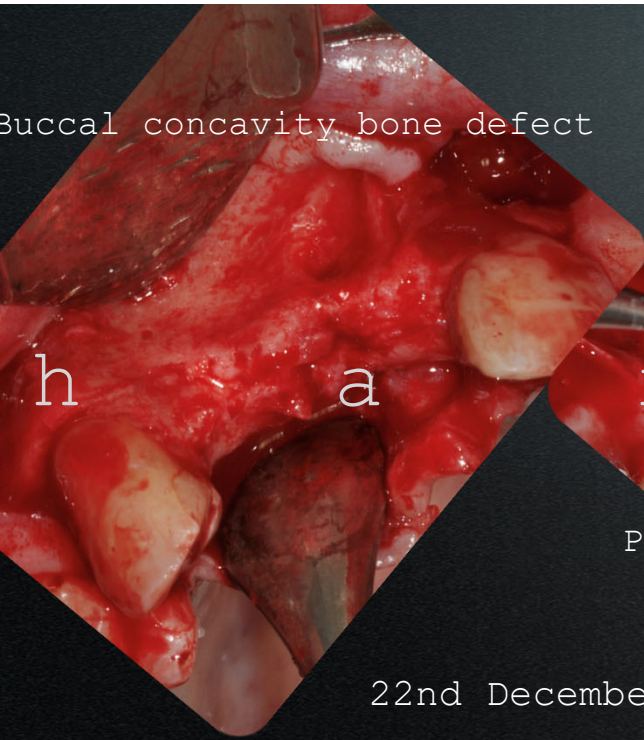


## Treatment Plan

- Bone augmentation with autogenous block graft & wait 4 months
- Implant in 11 area
- Cantilever bridge on one single implant

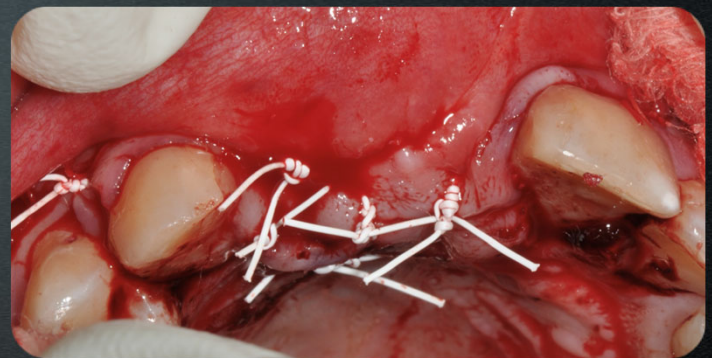
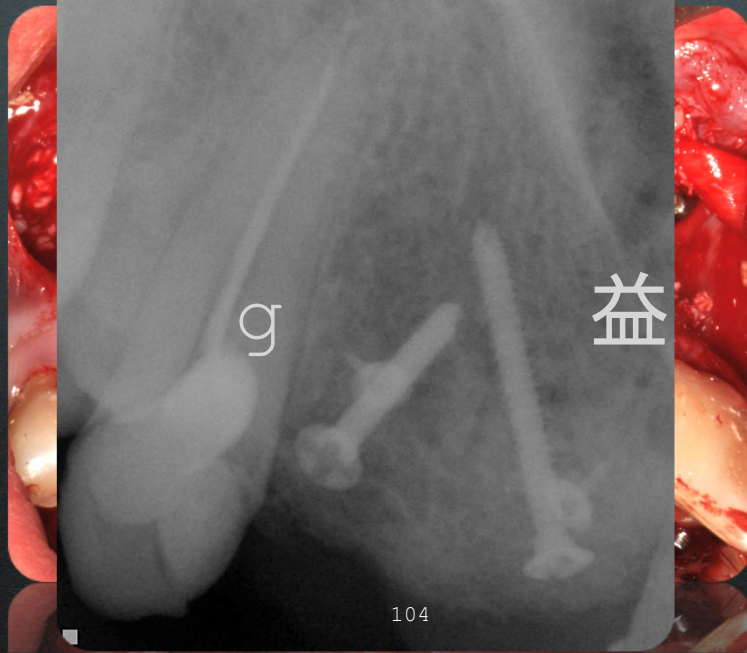
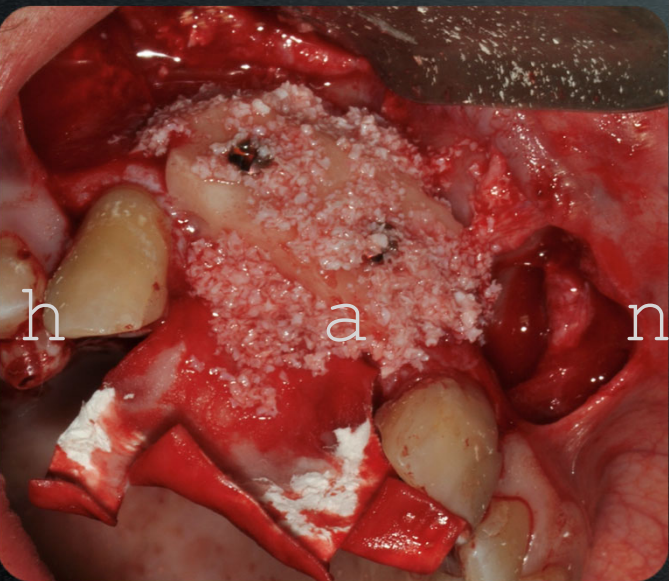






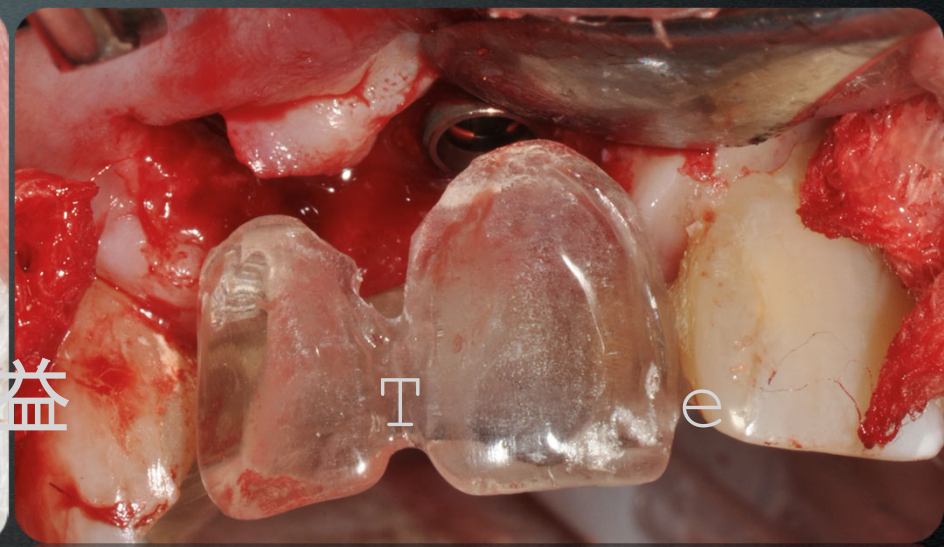
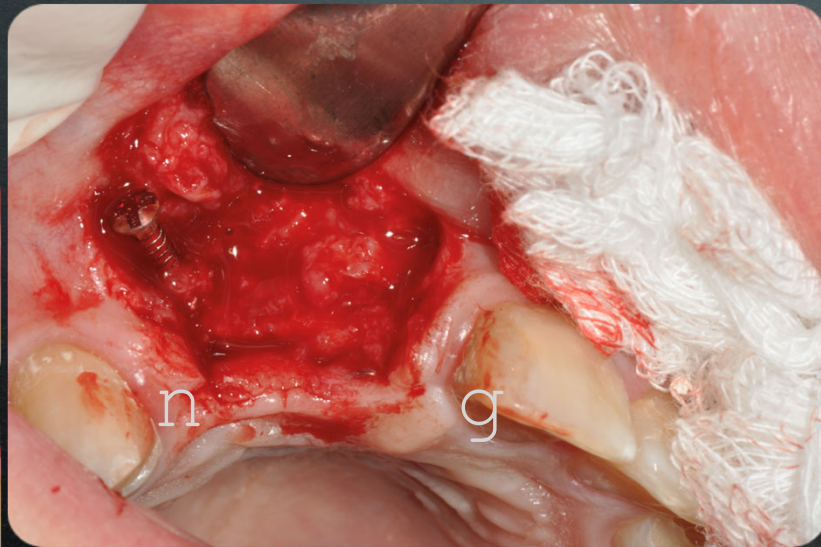
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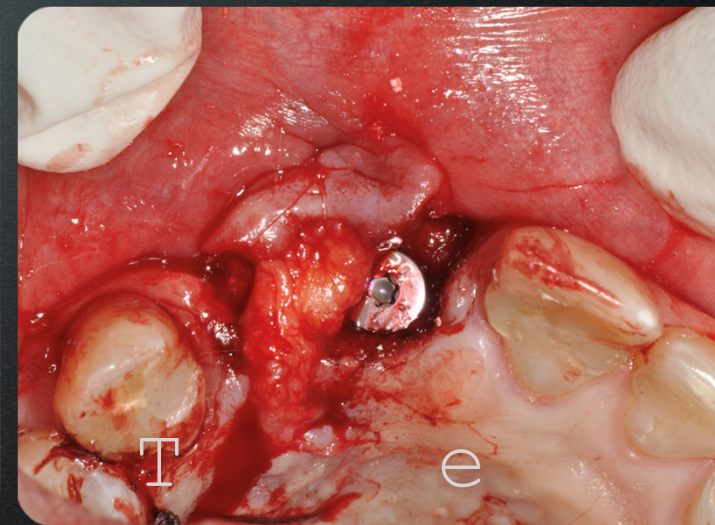
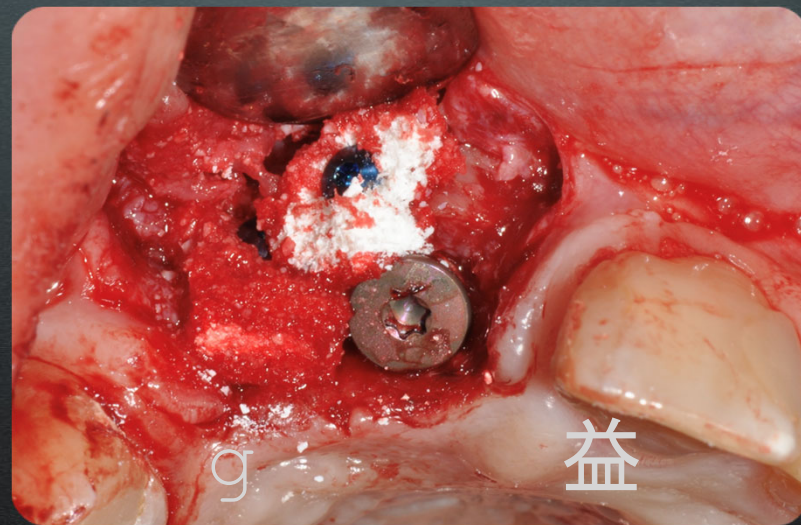
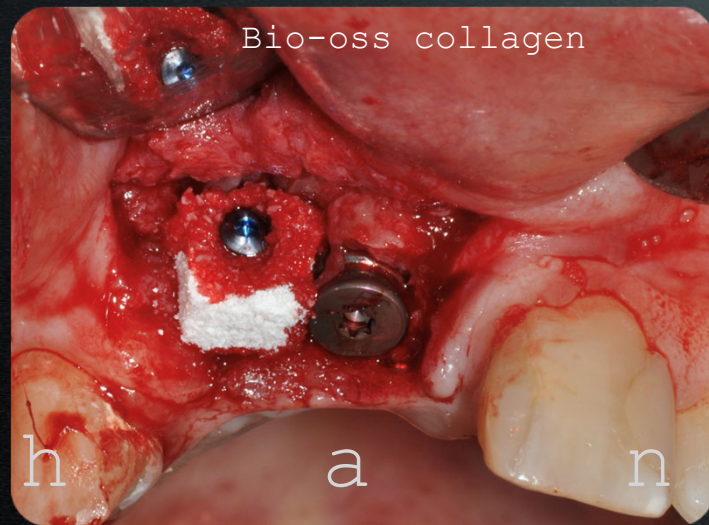
22nd December 2011





16th May 2012 (almost 5 months)





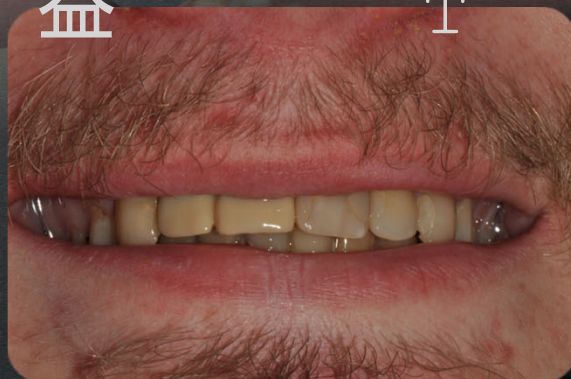




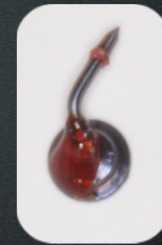
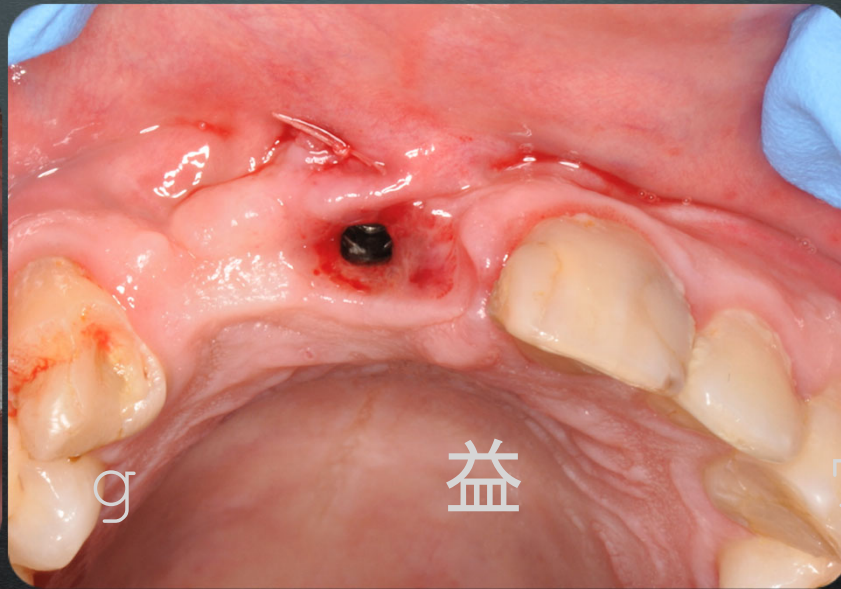
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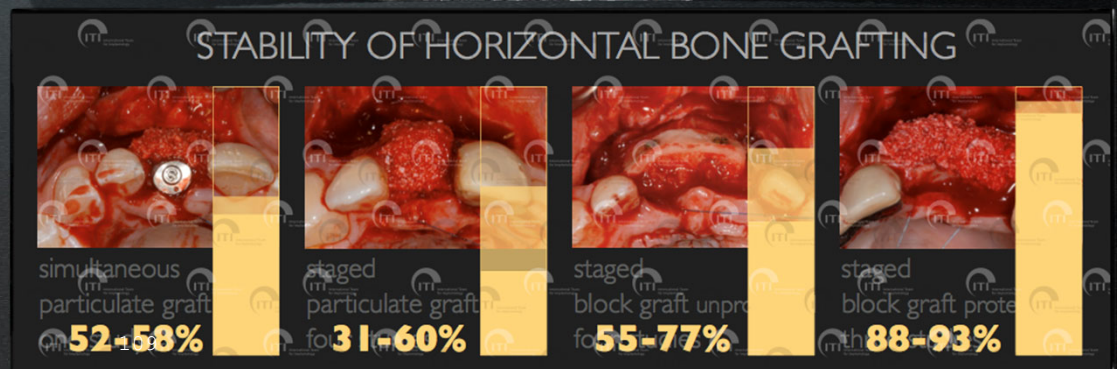
Review on 13th August 2017





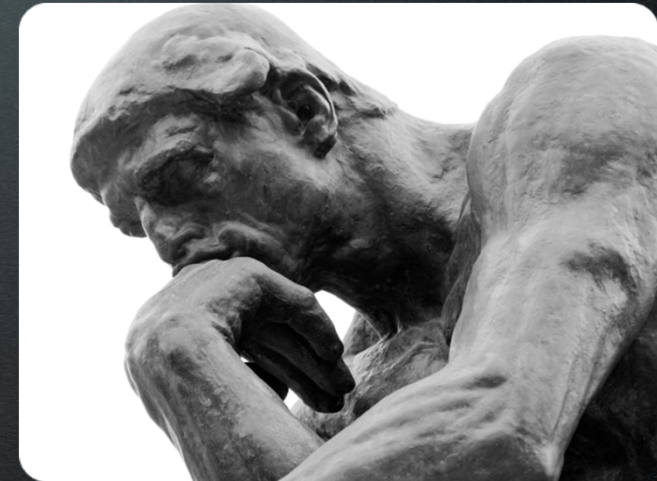
## Reduction of Autogenous Bone Graft Resorption

- Maiorana et al (2005)
- Graft +/- Bio-Oss coverage
- 9.3% vs 18.3% showed resorption
  
- von Arx, Buser (2006)
- Bio-Oss + Bio-Gide membrane
- 7.2% showed resorption
- mean gain (width) 4.6 mm (2 - 7 mm)



## Lesions learned

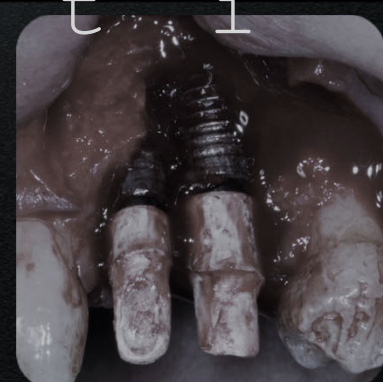
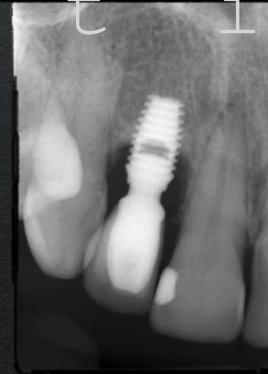
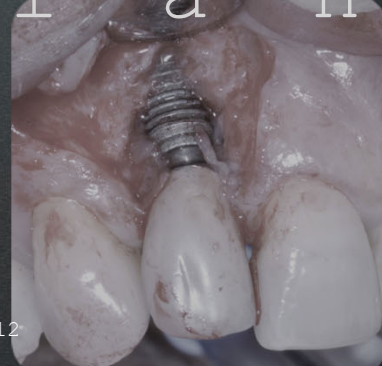
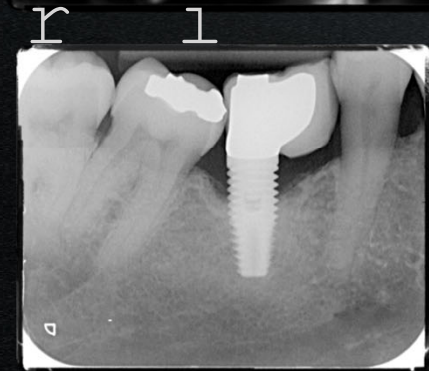
- Rapid revascularisation of the graft is the Key.
- Autogenous block graft vs particulate graft (0.05mm vs 0.5mm per day).
- Non-vital bone will be resorbed.
- Overcontour is not necessary.
- Respect natural biology, overbuilding may result in bone resorption
- Protection of block graft from ABBM & collagen membrane is questionable .







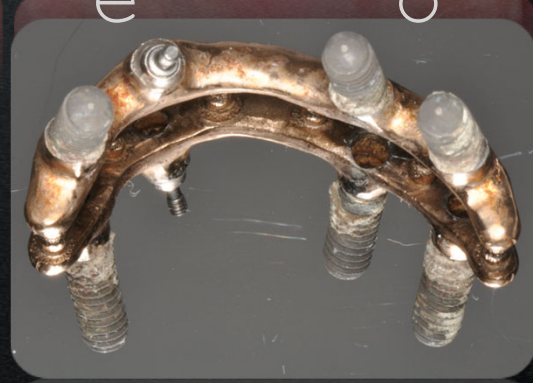
[www.dentalimplantsupport.club](http://www.dentalimplantsupport.club)



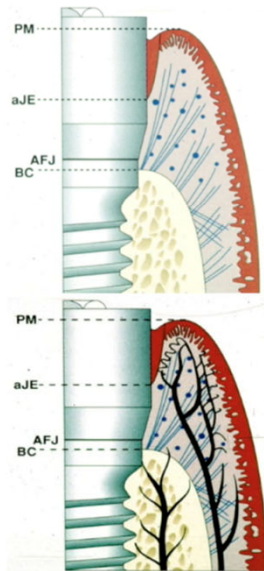
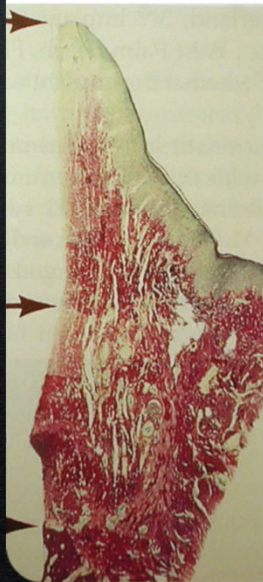
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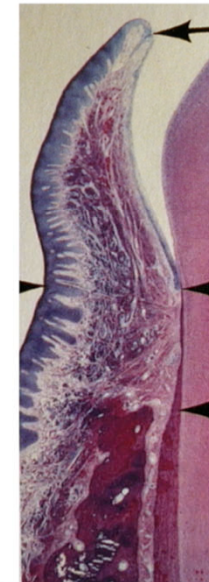
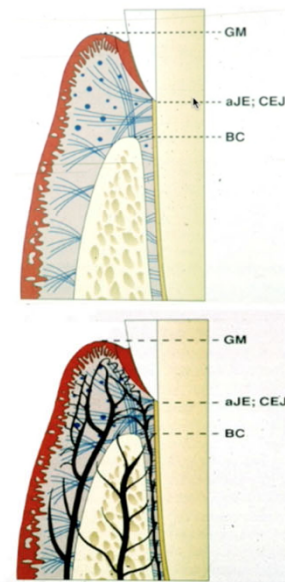
Prevalence of Peri-implantitis: 0 to 39.7% at implant level



## PERI-IMPLANT TISSUES

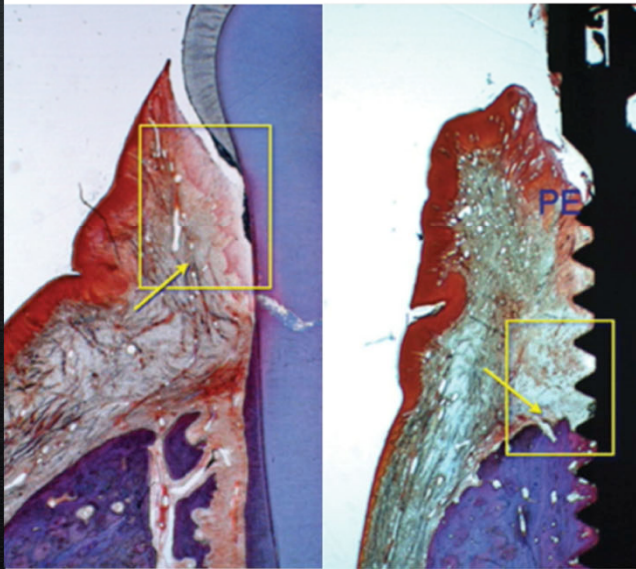


## PERIODONTAL TISSUES

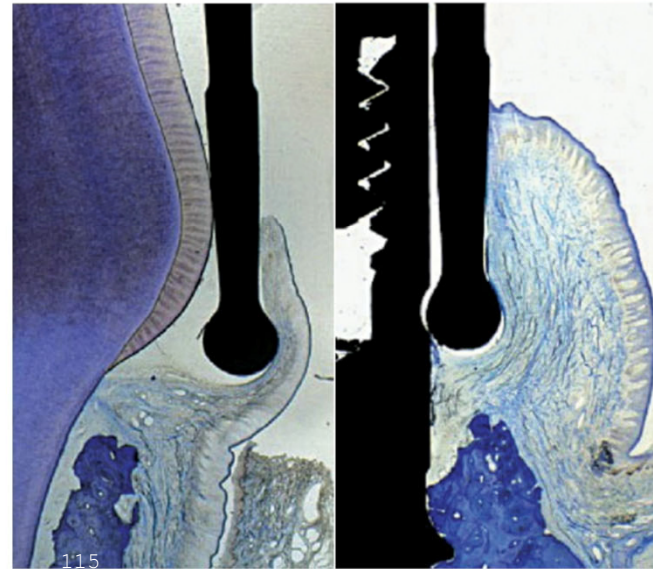




### Resistance to infection



### Resistance to probing



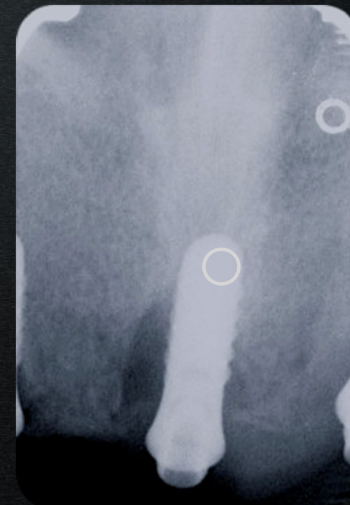
## Risk factors contributing to development of Peri-Implantitis

- Smoking
- History of periodontitis
- Systemic diseases
- Hard tissue defects
- Soft tissue defects
- Iatrogenic factors:
- Lack of maintenance programme





Clinical Case 10 (Sept. 2001)



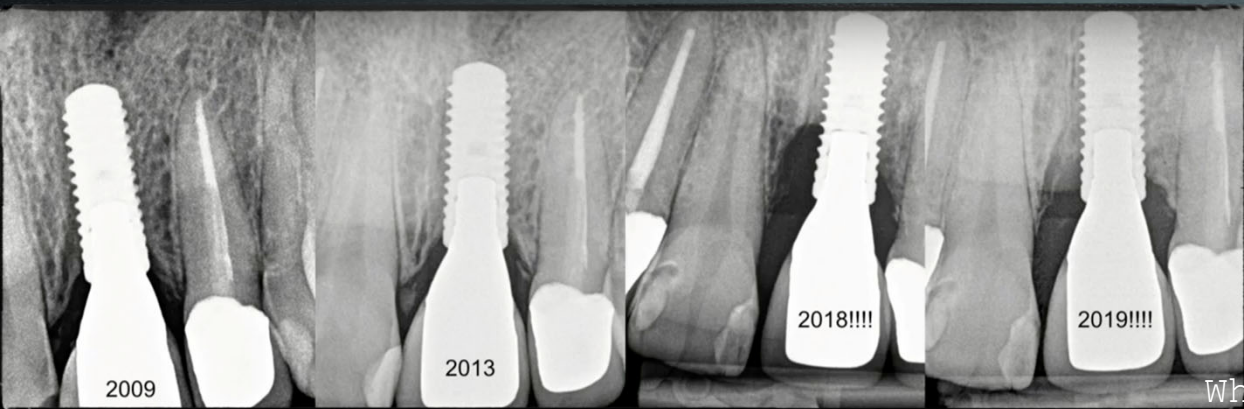
Palatal positioning of 11 implant: difficult access for maintenance

## Foreign bodies in the peri-implant sulcus

- Dental cement
- Other foreign bodies





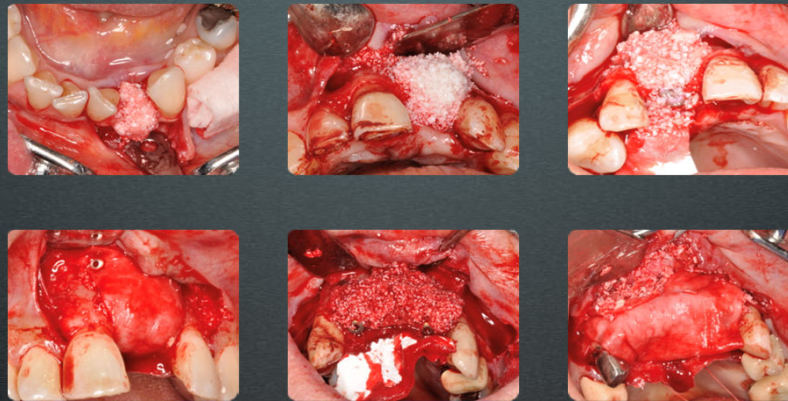


Whenever possible - Screw Retained Restorations



Prof. Toma Linkevicius





## Xenograft migration: friends or foes

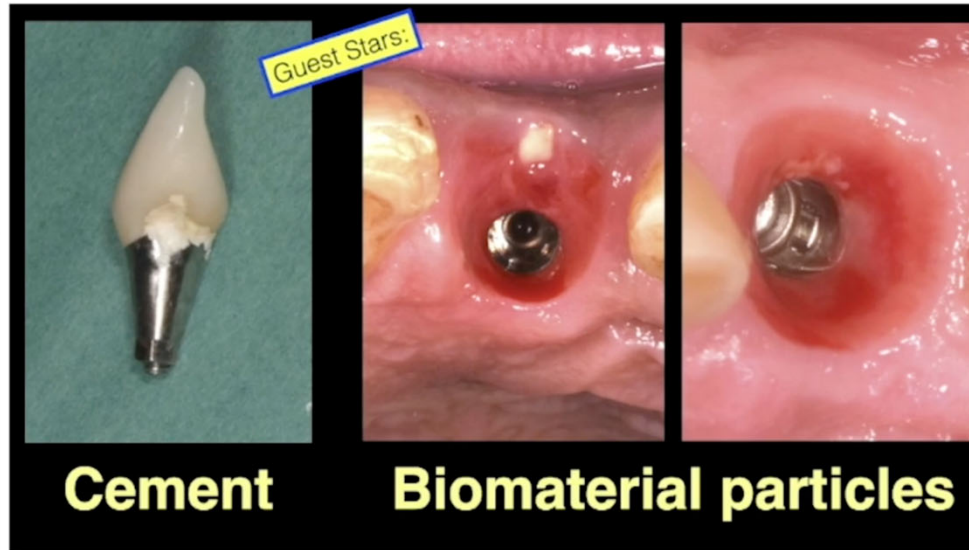






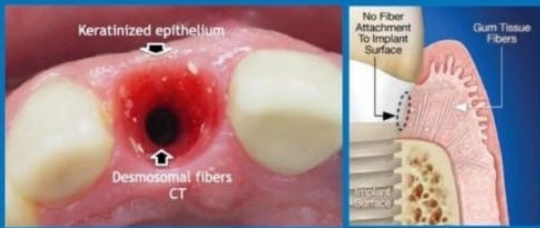
Dr. Nikos Mattheos

## Uninvited Guests





# SINGLE TOOTH IMPLANT



Free webinar  
May 8<sup>th</sup>, 2020 @21:00 GMT+3



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Free Webinar



Follow up



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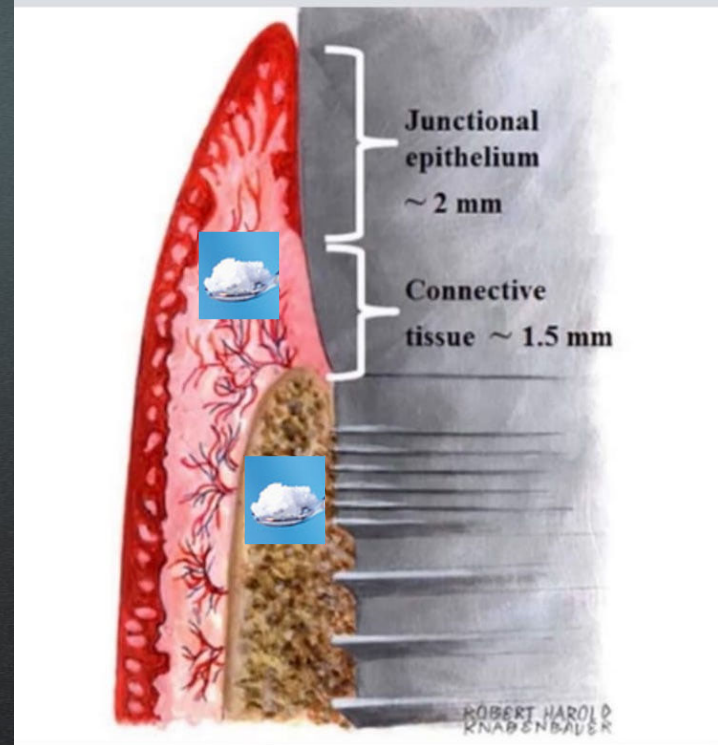
Dr. Robert Miller

player.vimeo.com is now full screen (Press [esc] to exit full screen mode)

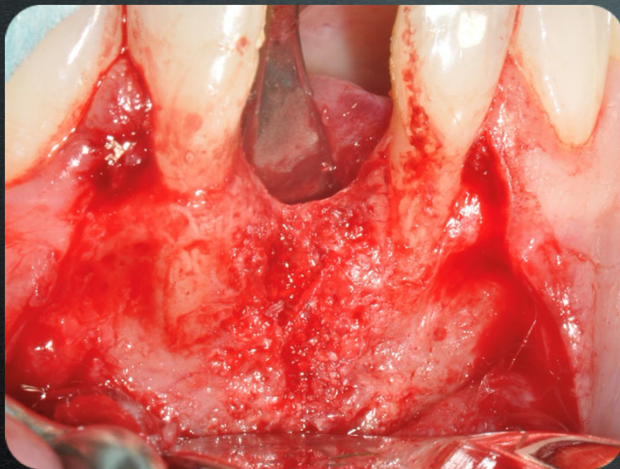




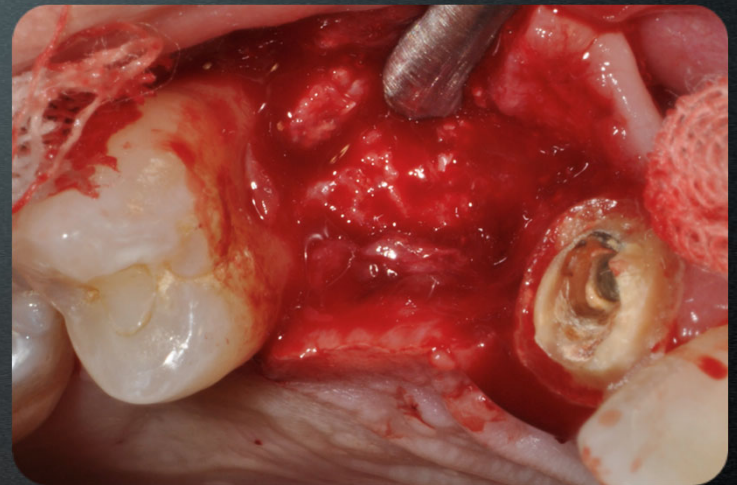
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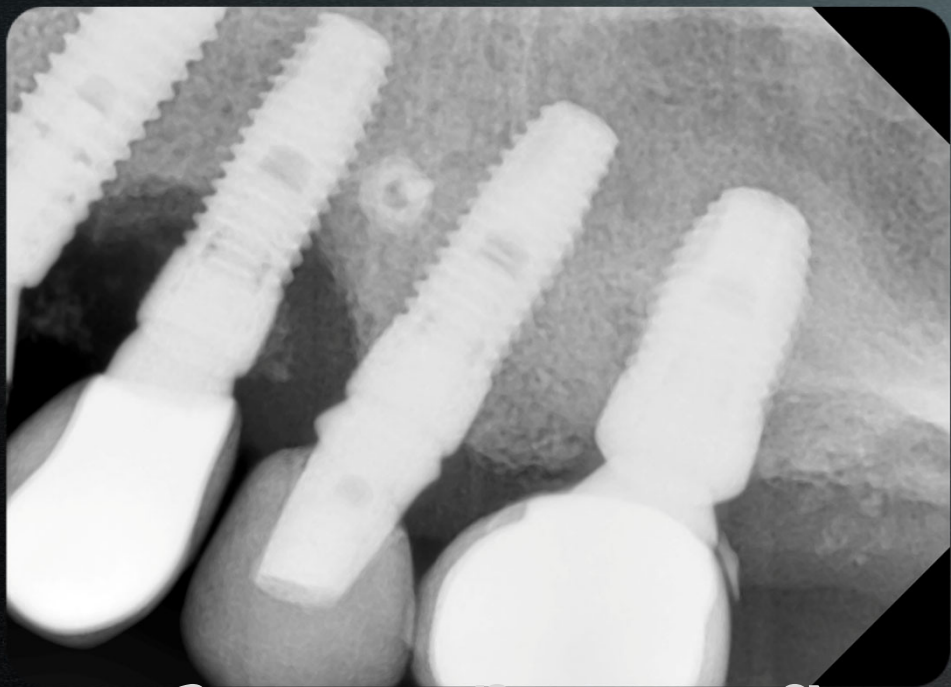
6 months after GBR with xenograft and collagen membrane



6 months after GBR with xenograft and PTFE membrane



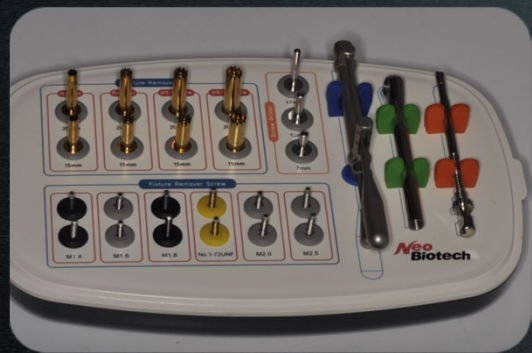




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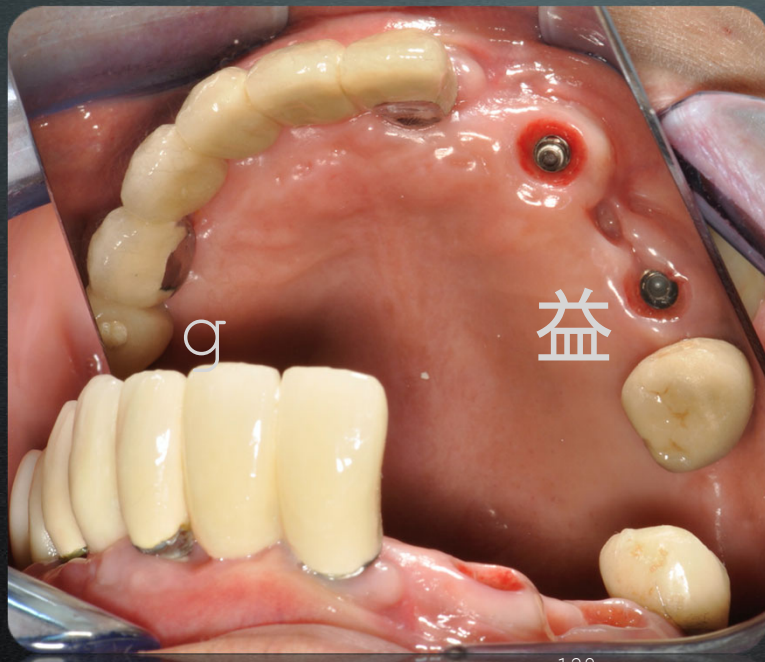


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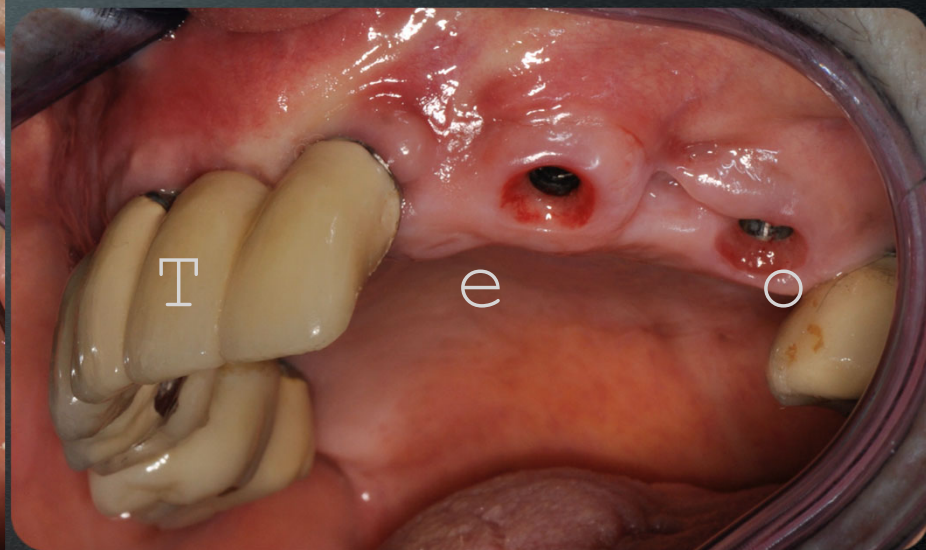
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# The long-term risks and complications of bovine-derived xenografts: A case series

Angel Emmanuel Rodriguez, Hessam Nowzari

Private Practice,  
Beverly Hills, California

### Abstract:

The frequency of dental implant related surgeries that involve soft tissue and bone augmentation procedures has increased significantly. Bovine-derived substitutes have been by far the most commonly used xenografts in dentistry. Albeit literature is replete with clinical studies in favor of bovine-derived graft materials, bibliographical data reporting on risks and clinical complications is scarce. Clinical impression and concern for patient safety led to the report we have provided. The aim of the present case series was to raise awareness on the long-term risks and late clinical complications of bovine-derived graft materials. Patients were referred to a private practice due to bone augmentation complications. Demographics, significant medical and dental findings are reported. Complications included sinus and maxillary bone pathoses, displacement of the graft materials, oroantral communications, implant failure, foreign body reactions, encapsulation, chronic inflammation, soft tissue fenestrations and associated cysts. Bovine-derived graft materials were not biodegradable. Resolution of the associated lesions and symptoms was achieved after the removal of the bone graft materials. The surgical removal of the xenograft materials may require advanced clinical skills because of the different configurations clinicians might encounter of the non-resorbed and migrated particles. The authors' concern is that patient morbidity may not be reduced with xenografts, due to the inherent risks and associated complications. Clinicians seeking to provide functional and esthetic outcomes should be aware of the complications of the bovine-derived graft materials. The long-term safety of xenografts and their potential association with disease are valid concerns.

### Key words:

Anorganic bovine bone substitutes, bone transplantation, bovine-derived graft, complications, dental implant, maxillary sinus, xenograft

### INTRODUCTION

Esthetics is an inseparable part of today's dental treatment; however, consistency of results, reliability of treatment modalities, and

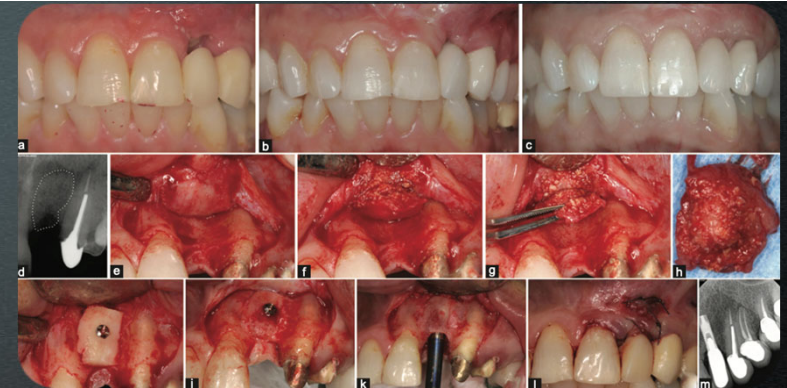
Dental literature is replete with clinical studies in favor of anorganic bovine bone as grafting material. Nevertheless, a close evaluation of published papers in favor of bovine-derived graft materials reveals wide variation in the

### Access this article online

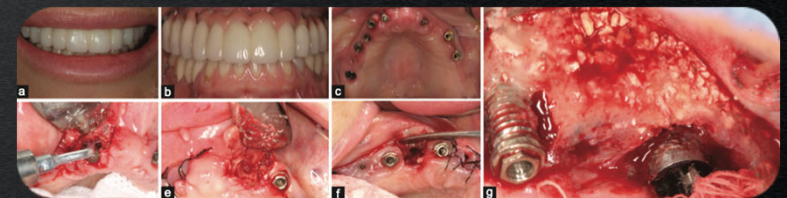
Website:  
www.jisponline.com

DOI:  
10.4103/jisp.jisp\_656\_18

Quick Response Code:



Dr Angel Rodriguez  
Dr Hessam Nowzari





## Medico-legal implication



### Consultation (2012)

- Healthy 65 year old Caucasian lady (Margaret)
- Minor discomfort with implants
- Non Smoker
- Oral hygiene: unsatisfactory
- 3 x implants placed in 2007
- In Cambridge with mentor Grafting were done
- Not happy with the outcome
- Peri-implantitis with “bone loss”



Implants are crowded together  
Exposed implant surfaces  
Thin and poor quality soft tissue  
Frenum and muscle pull  
Maintenance is difficult

Correct treatment plan: Staged approach  
Regenerate Hard tissue with VRA & Sinus  
Graft  
Then implant placement



**Bone loss happens to every implant system  
No single system is immune from it !!!  
If we do not respect biology,  
It is inevitable to have bone loss around implants !!!**





True Regeneration is that possible ? Final 2 cases



Dodgy Repair



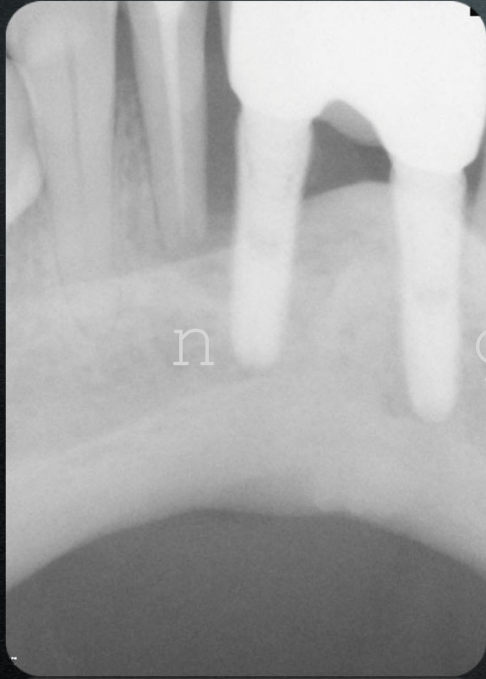
## Clinical Case 11 (January 2018)

- Healthy 60year old Caucasian lady: (Janice) UK
- Main complaint: Discomfort beneath Implant retained restoration which was placed 3 year ago
- Non Smoker & fair oral hygiene
- 42 periodontally compromised
- Advance bone loss associated with implant 41
- Implant placed well over 1 years ago
- 2 x Implantium implants in 31 & 41
- Splinted cemented retained bridge
- Treatment only completed 2 years ago
- Massive bone loss around implant 41
- Patient would like to keep the bridge if possible



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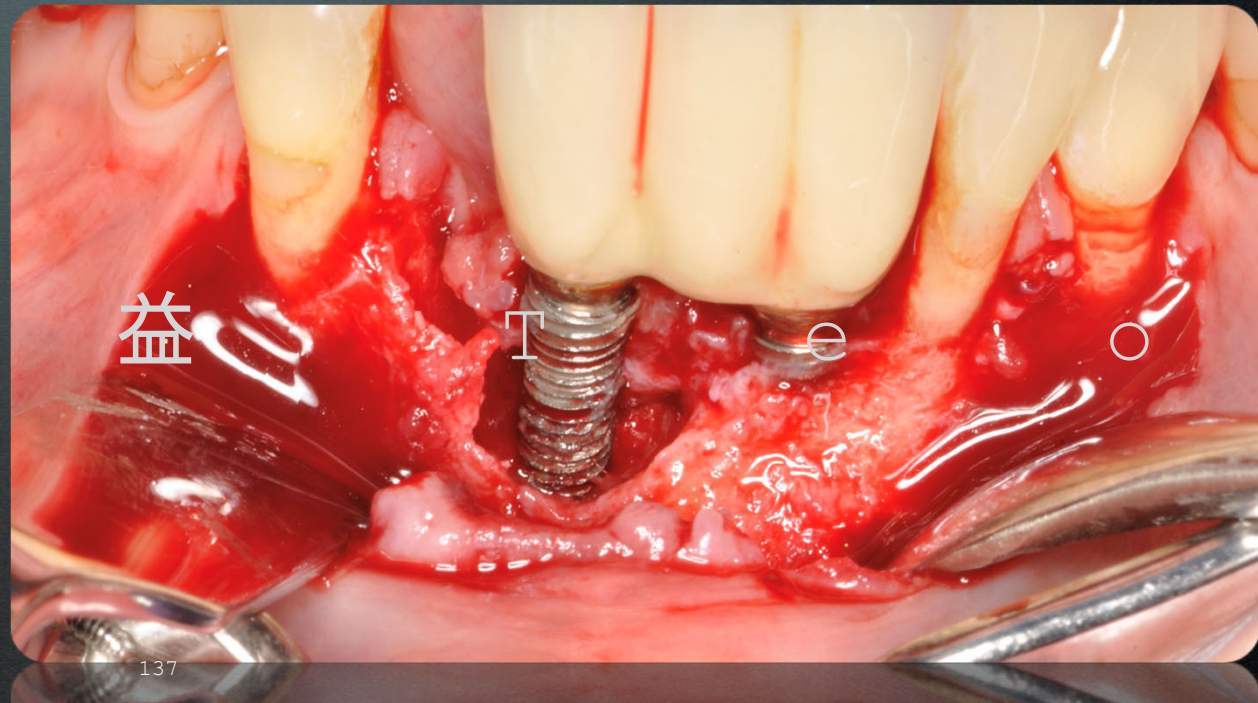
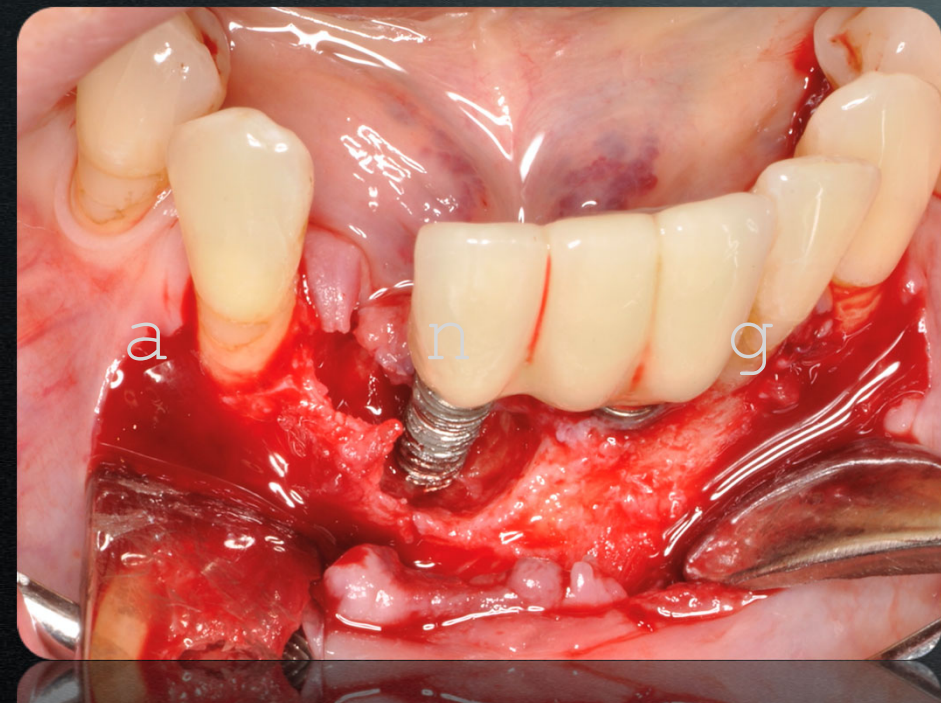
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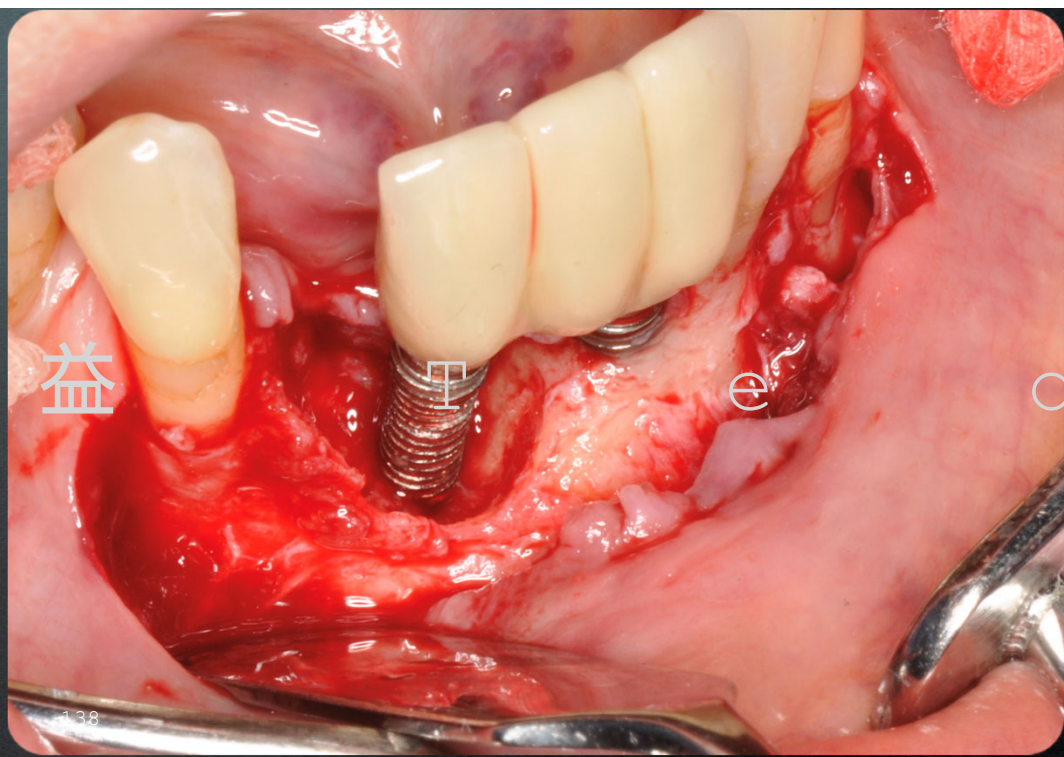
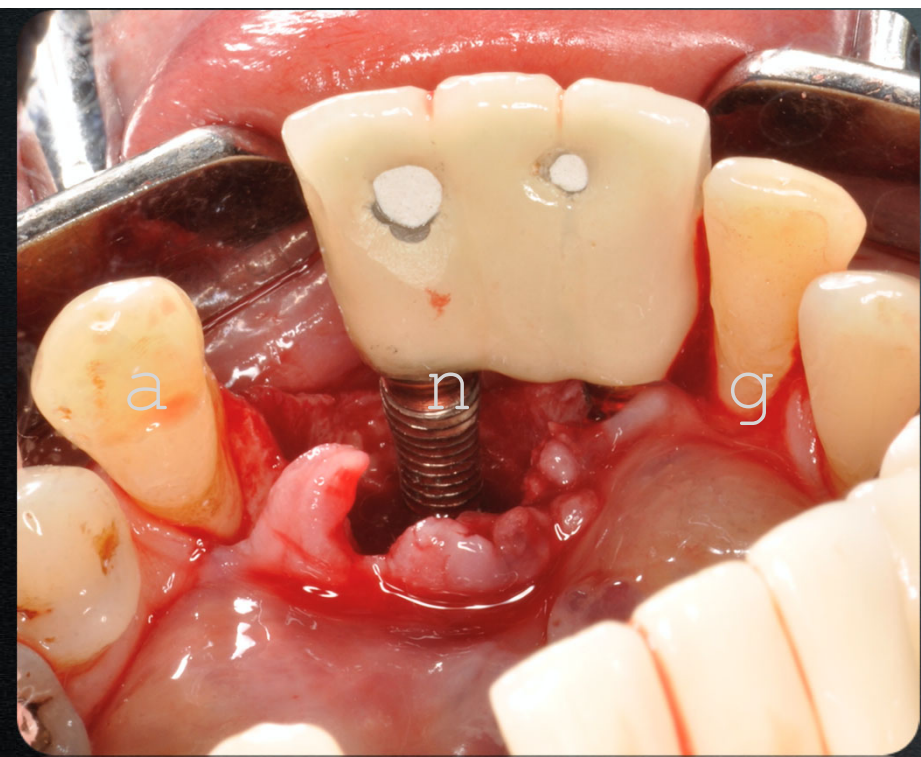
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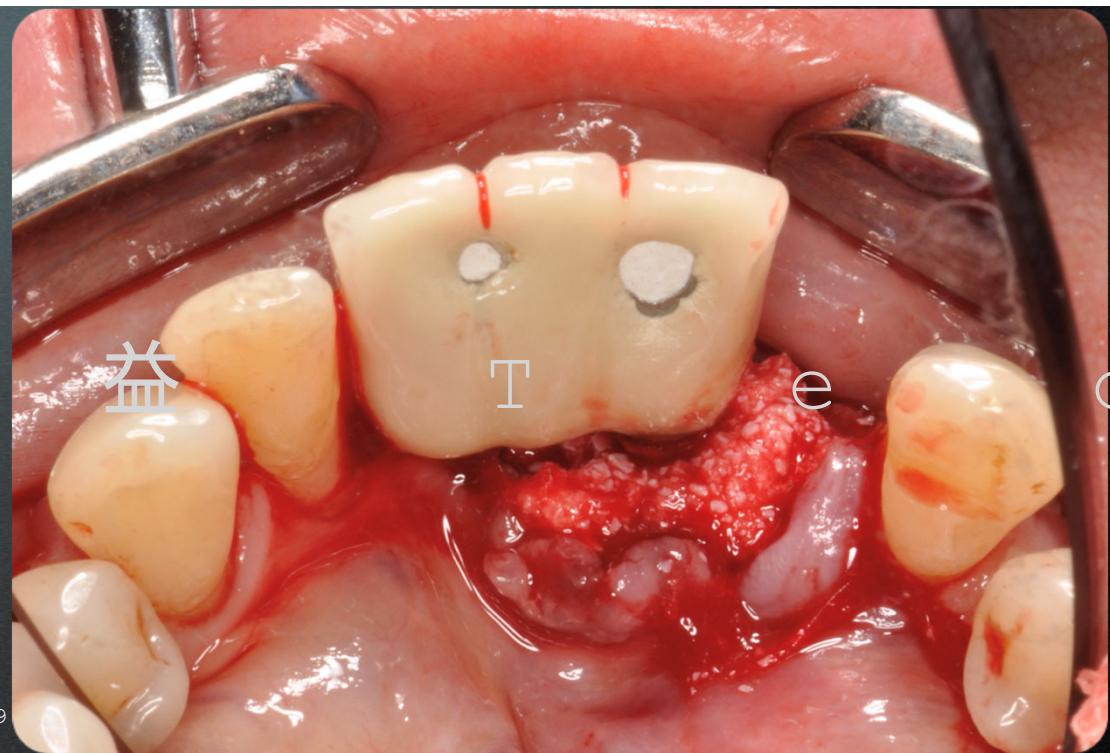
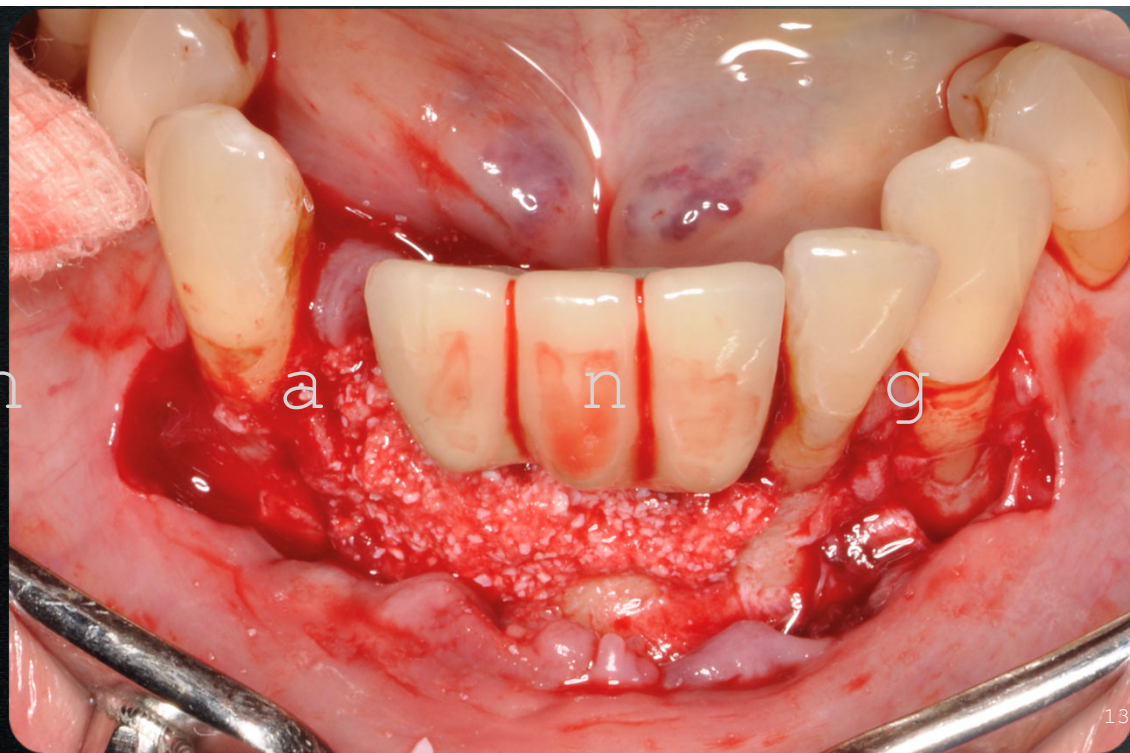
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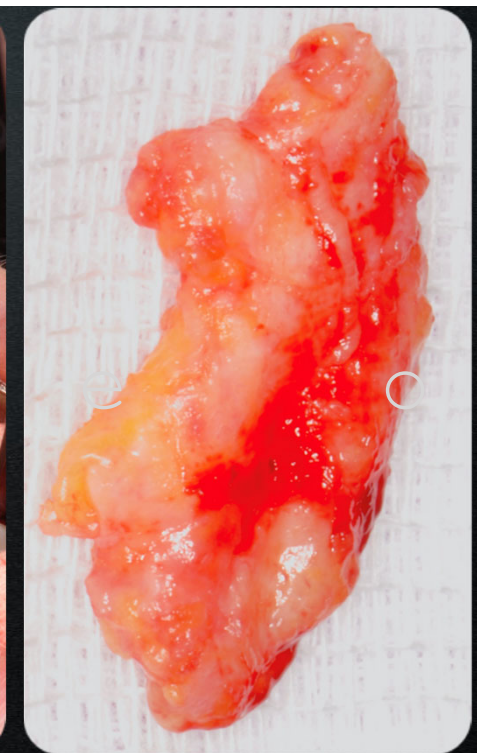
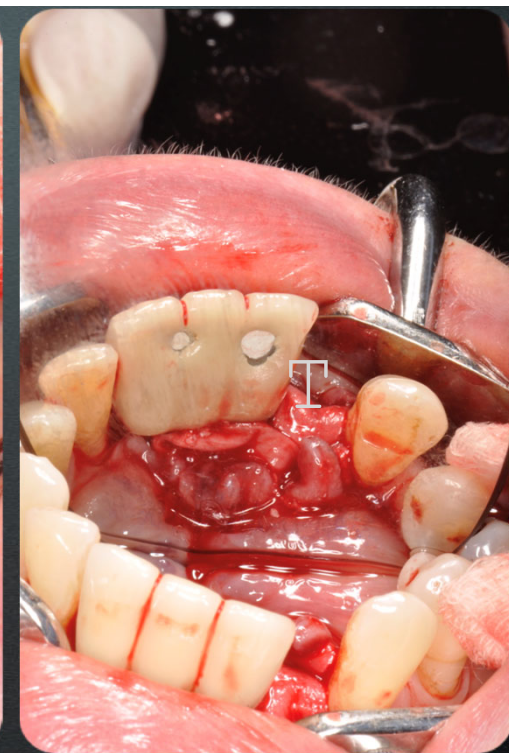




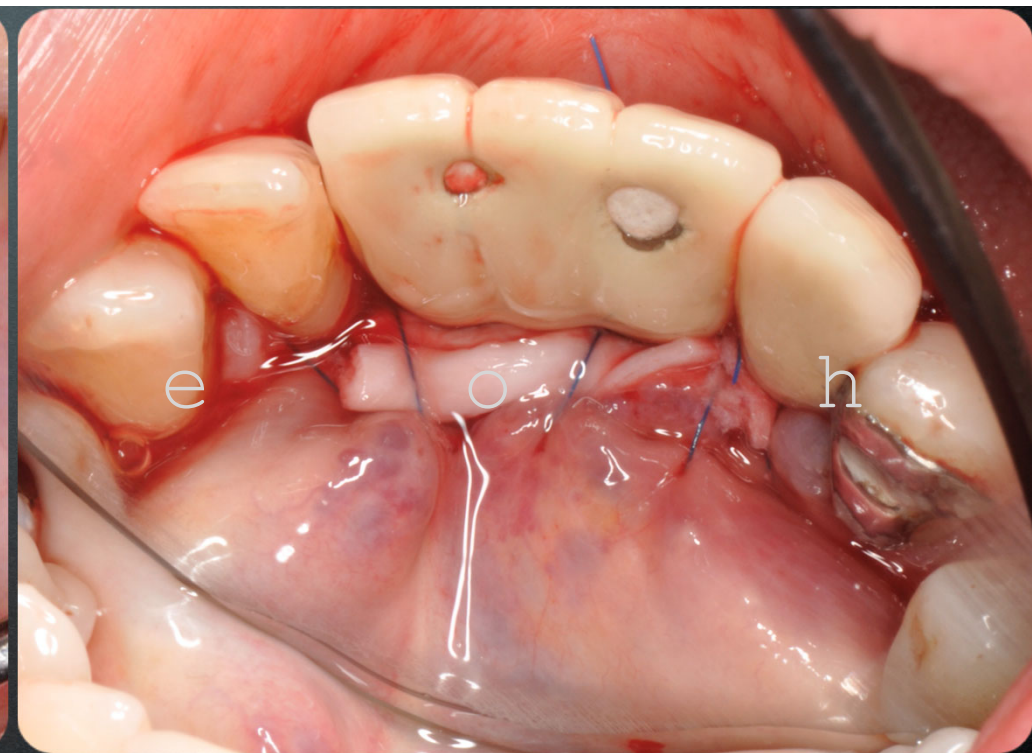
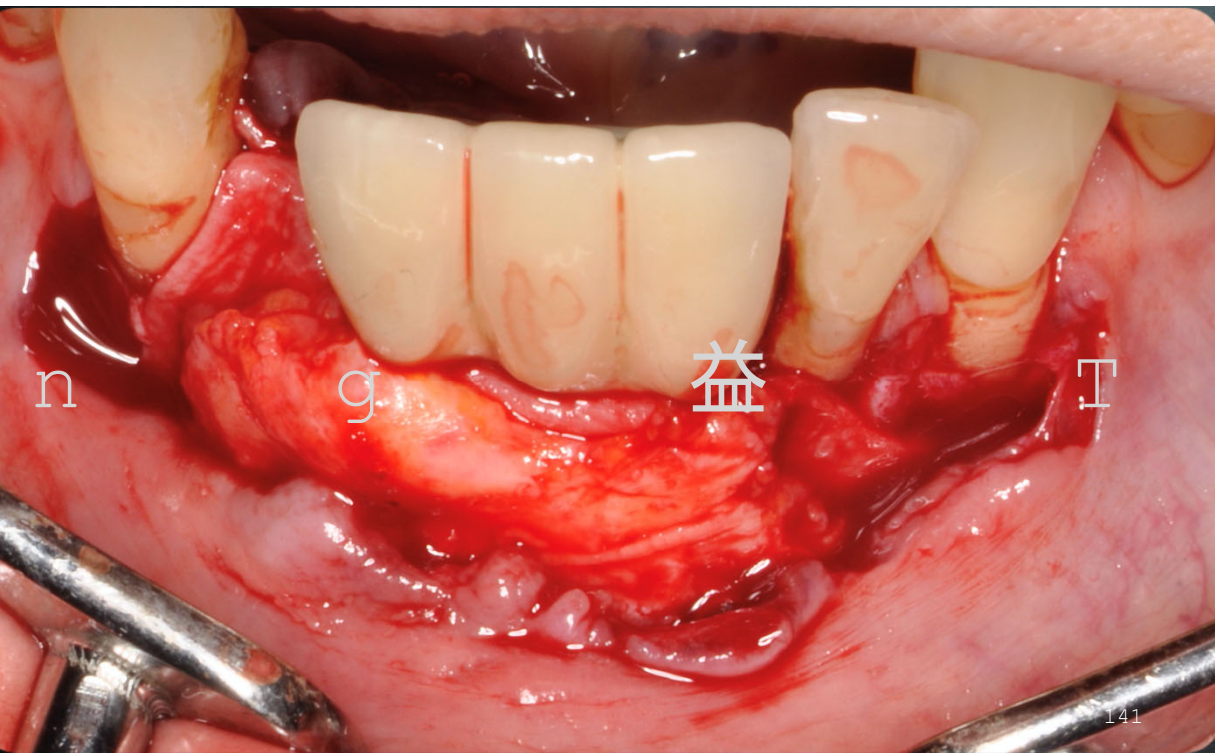


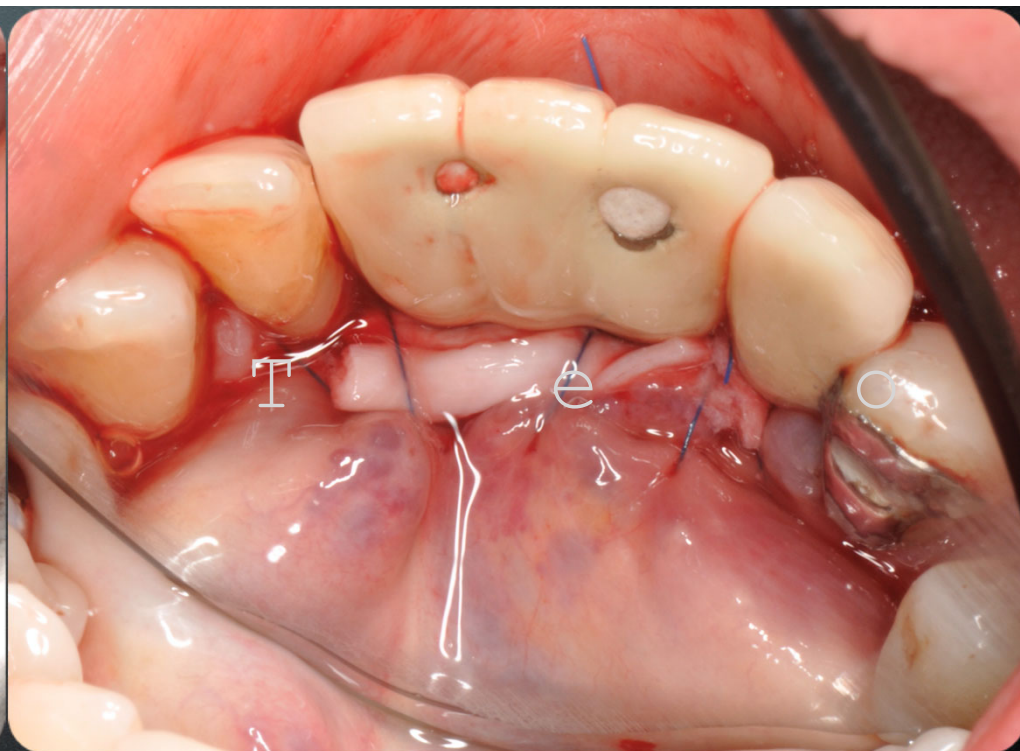




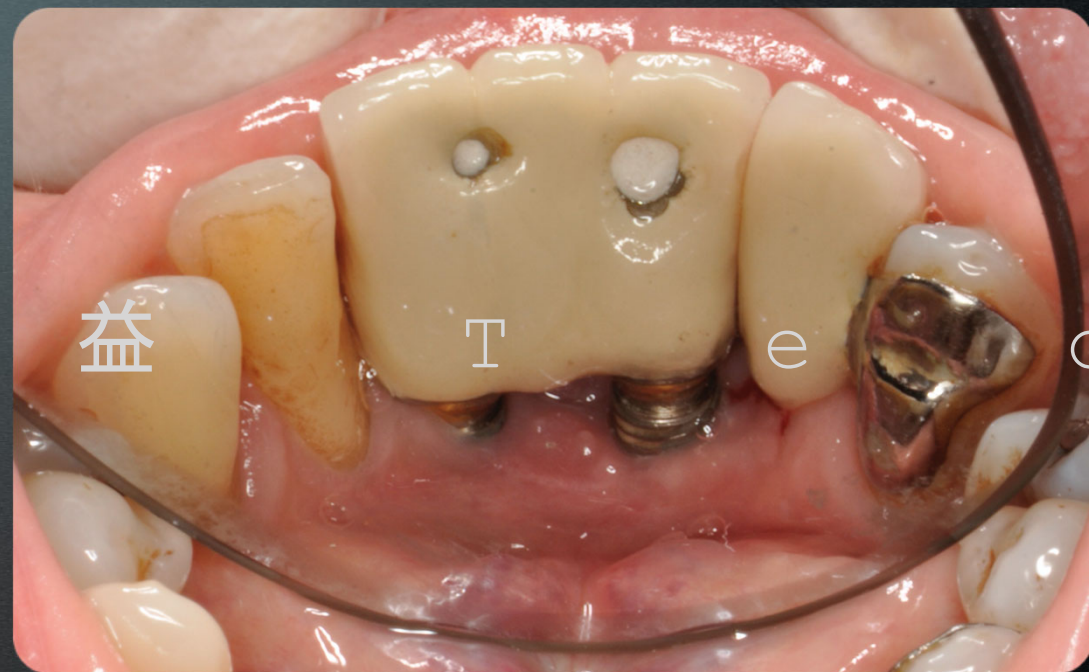








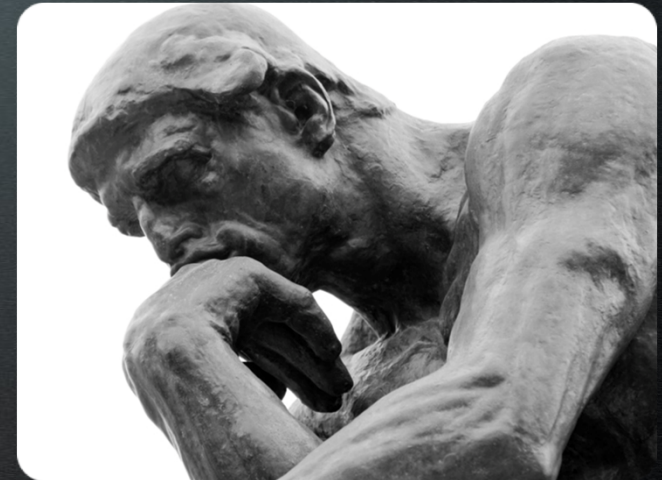




Salvage operation

## Lesions learned

- Only affect the implant 41, whereas implant 31 unaffected
- Suspicion: chronic periodontal condition of 42 probably induced infection of bone graft (biomaterial)?
- Implant is infection prone, especially if biomaterials used around dental implants
- Ironically, xenografts were used to fill the defect,. Low Resorption Rate!







Restoration is a fine art !

## Clinical Case 12 (March 2019)

- Healthy 65year old Chinese lady: (Sze) HK
- Main complaint: Dislodged Implant retained restoration
- Non Smoker & fair oral hygiene
- Bone loss 17 & 18; 34 periodical lesion
- Implant placed well over 15 years ago
- 2 x Nobelbiocare RP Replace Taper 11.5mm x 4.3mm
- Splinted cemented retained crowns
- Pocket around mesial implant around 5mm
- Implant platform exposed
- Would like to keep the remaining implant if possible



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28th March 2019

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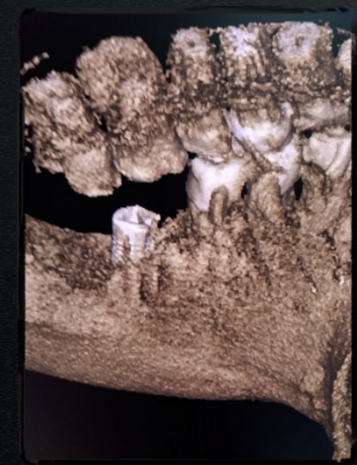
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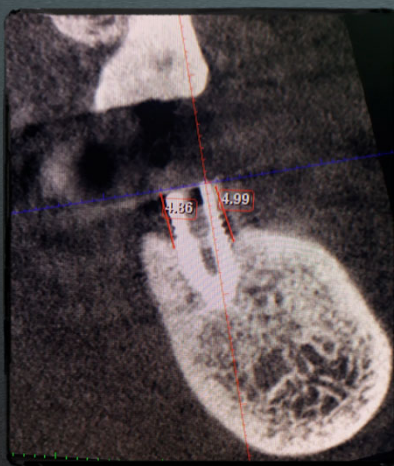
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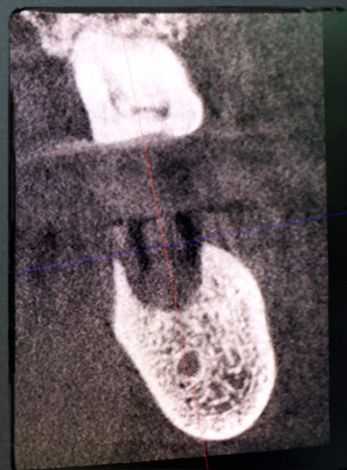
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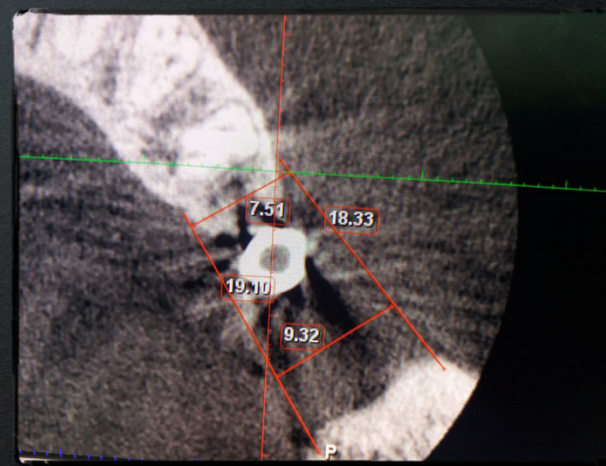
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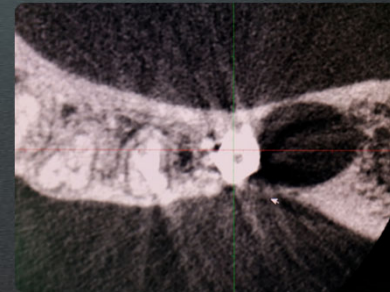
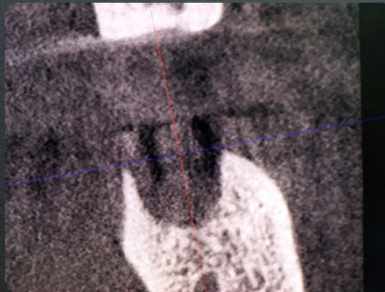
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## Aetiology of Peri-implantitis

- Splinted cement retained restoration.
- Access for cleaning ?
- Soft tissue thickness ?
- Stock abutments were used.
- Non-smoker and oral hygiene is satisfactory
- Cement retained restorations



Plausible cause:

Retained cement and difficult access for maintenance  
Peri-implantitis and bone loss

**The influence of the cementation margin position on the amount of undetected cement. A prospective clinical study.**

*Linkevicius T, et al. Clin Oral Implants Res. 2013 Jan;24(1):71-6.*

- Cement remnants were found in almost all cases.
- The amount of retained excess cement was strongly correlated to the depth of the restoration margin below the mucosal crest.
- Only supra-mucosal margins were truly safe.
- Radiographs were unreliable in detecting excess cement.

The Ten Commandments of Implant Dentistry

**Does residual cement around implant-supported restorations cause peri-implant disease? A retrospective case analysis.**

*Linkevicius T, et al. Clin Oral Implants Res. 2012 Aug 8. doi: 10.1111/j.1600-0501.2012.02570.x. [Epub ahead of print]*

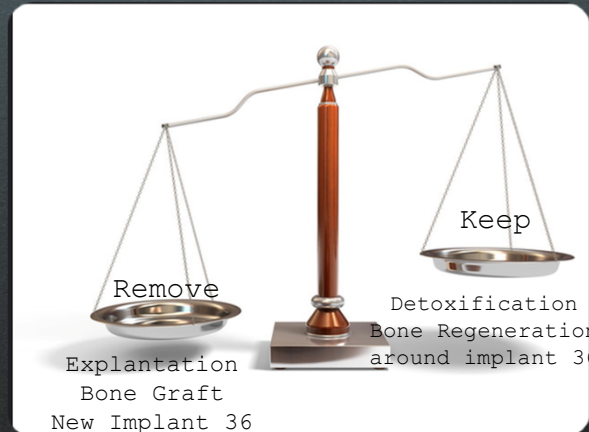
- 129 implants. 73 with retained excess cement. 85% of these developed periimplantitis.
- Retained cement + history of periodontal disease = periimplantitis in 100% of cases.
- No periodontal disease history + excess cement = 65% of cases with periimplantitis
- Control (238 screw-retained restorations) – 1 % periimplantitis.

The Ten Commandments of Implant Dentistry



## Treatment Plan

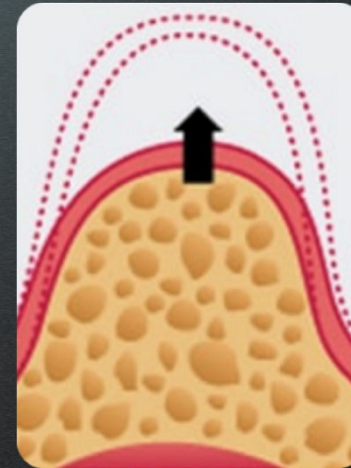
- General S/P
- Extraction 18 & 17
- 34 RCT
- What should we do with implant 36?
- 36 implant has more than 50% of bone around it
- No pus discharge or active inflammation



- Peri-implantitis treatment:  
detoxification of the mesial implant  
and bone regeneration in both 36 & 37  
area (Vertical Bone Augmentation)
- Wait 4 months
- New implant in 37 and CTG
- New restorations on implants

## Vertical Ridge Augmentation (VRA)

- Extremely challenging !!!
- No mechanical support from bony walls
- Buccal and lingual flap advancement
- Rate of flap dehiscence is high > 40% !
- Materials ?
- Which technique ?





## Lethal Photosensitization, Autogenous Bone, and e-PTFE Membrane for the Treatment of Peri-implantitis: Preliminary Results.

- **Source:** International Journal of Oral & Maxillofacial Implants . May/Jun2000, Vol. 15 Issue 3, p374-382. 9p. 5 Color Photographs, 2 Black and White Photographs, 4 Charts.
- **Author(s):** Haas, Robert; Baron, Monika; Dörtbudak, Orhun; Watzek, Georg

- **Abstract:** This clinical study reports on the results of a new method in the treatment of peri-implantitis. The surfaces of 24 plasma flame-sprayed cylindrical implants in 17 patients who were diagnosed with peri-implantitis were decontaminated with a combination of toluidine blue (100 µg/mL) and laser irradiation at a wavelength of 906 nm. Bone defects were filled with autogenous bone using e-PTFE membranes for retention of the grafting material. Premature membrane exposure occurred in all patients after an average of 3 weeks (±10 days) which required immediate removal of the exposed membrane in 1 patient. Since the soft tissue showed minimal signs of inflammation, the membranes were left in situ for another 6 weeks in all other patients. The mean radiographic peri-implant bone gain was 2 mm ± 1.90 mm after 9.5 months (maxilla 2.5 mm ± 2.38 mm; mandible 1.9 mm ± 1.87 mm). Two implants around which the initial bone defect had already reached the basket had to be removed after 10 months and 35 months, respectively, despite radiographic evidence of improvement of the peri-implant defect. The longer the membrane stayed in situ, the more bone was gained, as long as the membrane was covered by soft tissue (P = .01). However, the longer an exposed membrane was left in place, the smaller the resultant bone gain (P = .0001). Therefore, despite the absence of clinical signs of inflammation, exposed membranes should be removed immediately. The short-term results of this study corroborate the efficacy of the applied treatment method in prolonging the service time of dental implants involved with peri-implantitis.
- *Copyright of International Journal of Oral & Maxillofacial Implants is the property of Quintessence Publishing Company Inc. and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use. This abstract may be abridged. No warranty is given about the accuracy of the copy. Users should refer to the original published version of the material for the full abstract.*

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*Int J Oral Maxillofac Implants*, 2000 Jan-Feb;15(1):125-38.

## Treatment of peri-implantitis defects with autogenous bone grafts: six-month to 3-year results of a prospective study in 17 patients.

Behneke A<sup>1</sup>, Behneke N, d'Hoedt B.

### Author information

### Abstract

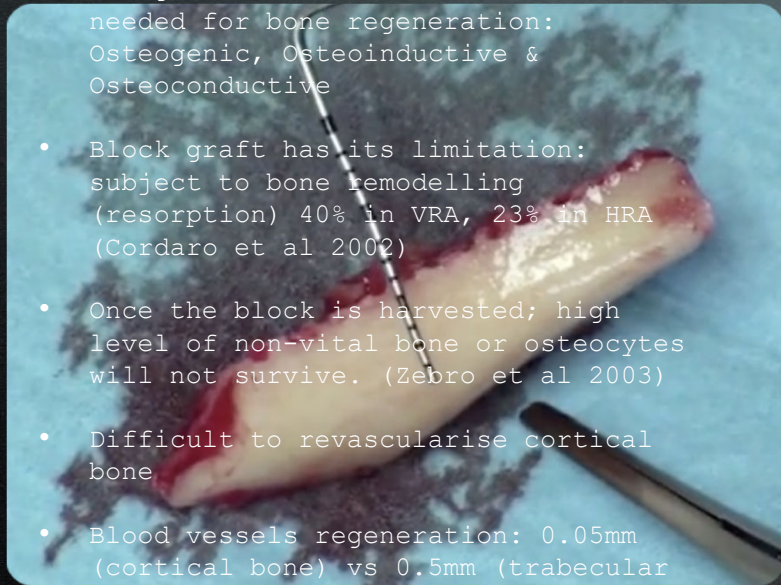
As part of an ongoing prospective study, the treatment of peri-implantitis defects using autogenous bone grafts was evaluated. This present report is based on data from 25 ITI screw implants in 17 patients with progressive peri-implant tissue destruction during the maintenance phase. Treatment of these lesions included raising flaps, removal of the surrounding granulation tissue, and air-polishing of the implant surface. Subsequently, corticocancellous bone grafts or particulate bone were placed into the peri-implant osseous defects, and the flaps were sutured around the cervical segment of the implants, allowing for transmucosal healing. Two of the 25 cases resulted in a negative outcome of the procedure. One of the transplants had to be removed 40 days after augmentation because of flap dehiscence and graft mobility. In another patient, the healing period was uneventful until the re-entry surgery, but when the site was reopened, the total graft volume was resorbed. The primary therapeutic success at re-entry surgery evaluated by intraoperative measurements resulted in a median defect depth reduction of 6.9 to 0.7 mm (P = .001), corresponding to a bone repair of 90%. The change in defect width was 1.9 mm (P = .002, repair 100%). A positive result of the reconstructive therapy has been observed during a re-evaluation time of up to 3 years. Median marginal bone loss was reduced from 6.2 to 2.3 mm after 2 and 3 years, respectively. The median vertical bone resorption of 4.5 mm was completely repaired. The crevicular fluid volume, a parameter of the level of marginal inflammation, along with probing depths and attachment levels, were reduced to a physiologic rate. The implant observation period until the first appearance of the lesion seems to be crucial to the effectiveness of the therapy. Early failures appearing within the first 2 years after implant placement showed a more stable therapeutic result over time.

PMID: 10697947

[Indexed for MEDLINE]

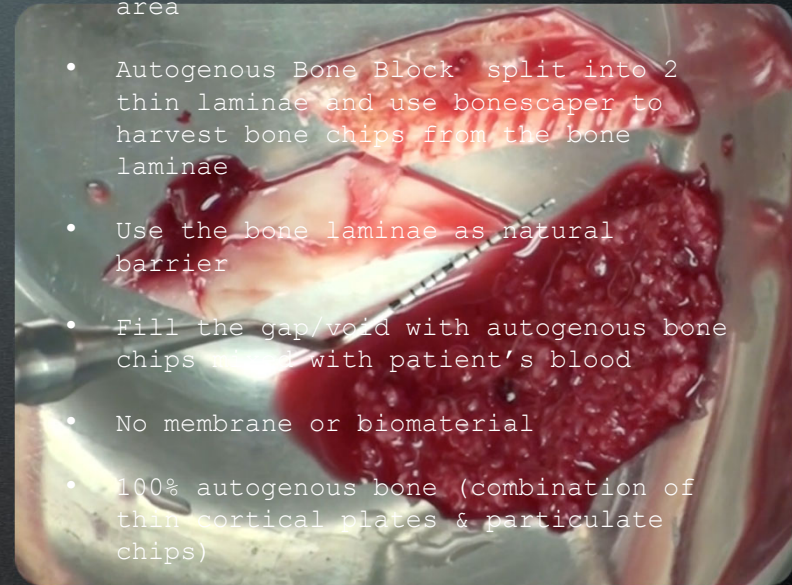
# Khoury Technique (introduction)

- Autogenous bone has all 3 factors needed for bone regeneration: Osteogenic, Osteoinductive & Osteoconductive
- Block graft has its limitation: subject to bone remodelling (resorption) 40% in VRA, 23% in HRA (Cordaro et al 2002)
- Once the block is harvested; high level of non-vital bone or osteocytes will not survive. (Zebro et al 2003)
- Difficult to revascularise cortical bone
- Blood vessels regeneration: 0.05mm (cortical bone) vs 0.5mm (trabecular bone)



Autogenous bone block from retromolar area

- Autogenous Bone Block split into 2 thin laminae and use bonescaper to harvest bone chips from the bone laminae
- Use the bone laminae as natural barrier
- Fill the gap/void with autogenous bone chips mixed with patient's blood
- No membrane or biomaterial
- 100% autogenous bone (combination of thin cortical plates & particulate chips)
- Rapid revascularisation of the graft







Take the Challenge

20th May 2019

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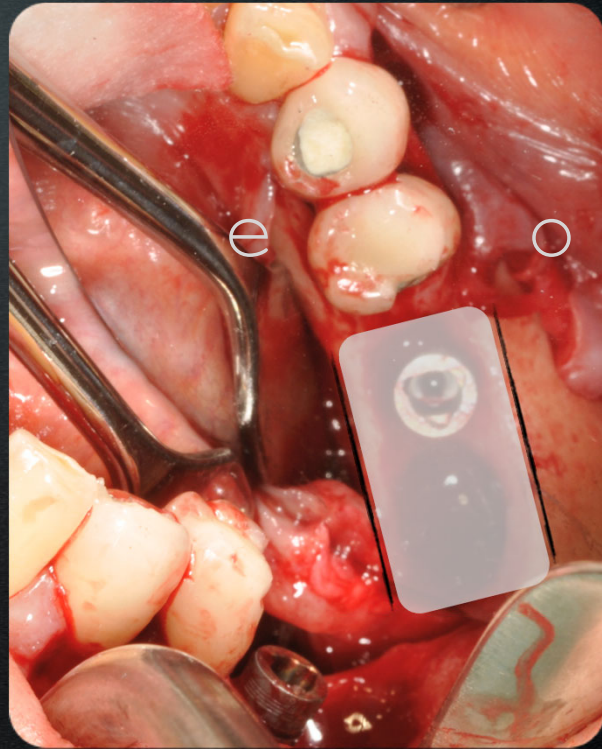
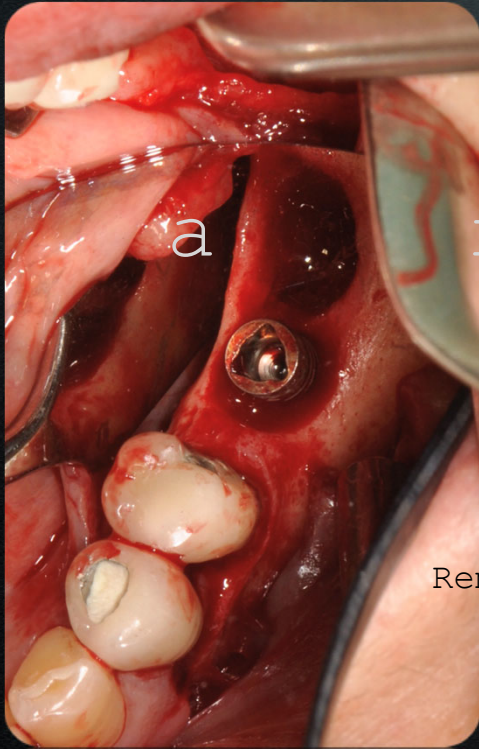
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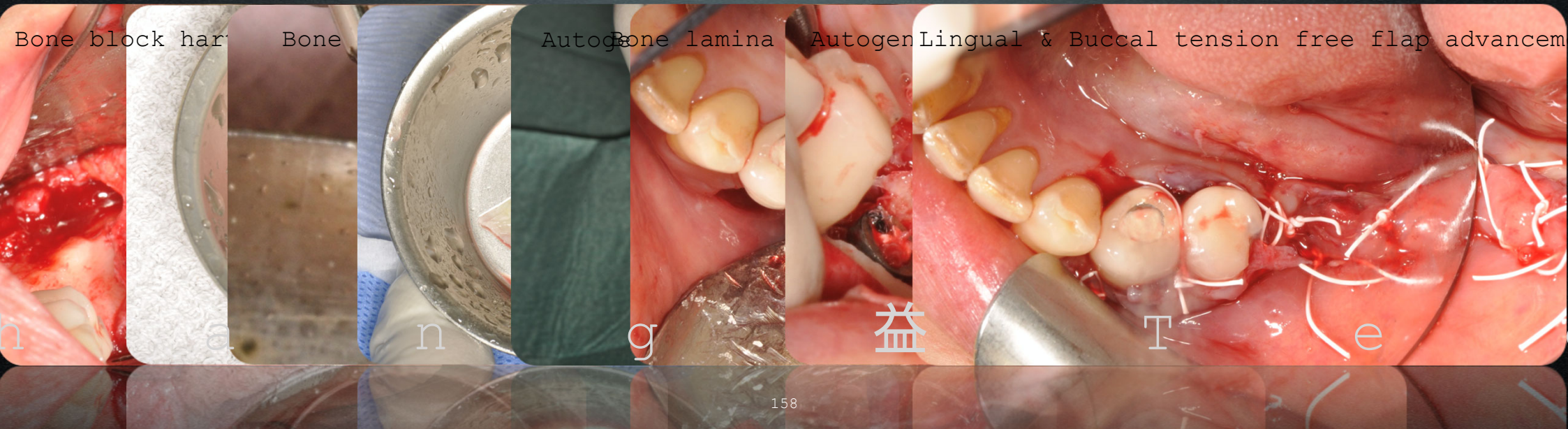
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Removal of Biofilm on implant surface  
1. Titanium brush  
2. Ultrasonic scaler  
3. Corsodyl

*Khoury bone plate/lamina technique + Autogenous bone chips*





September 2019

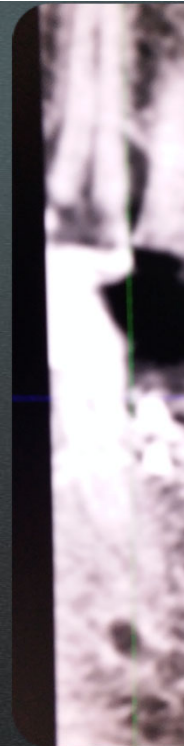


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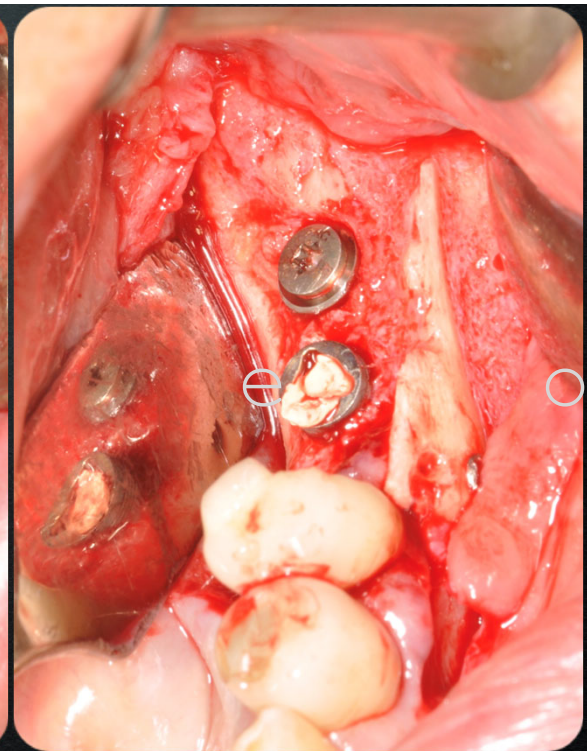
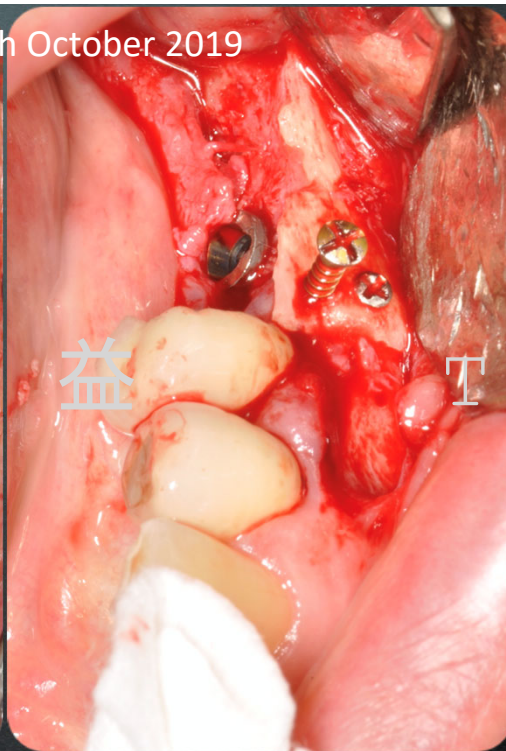
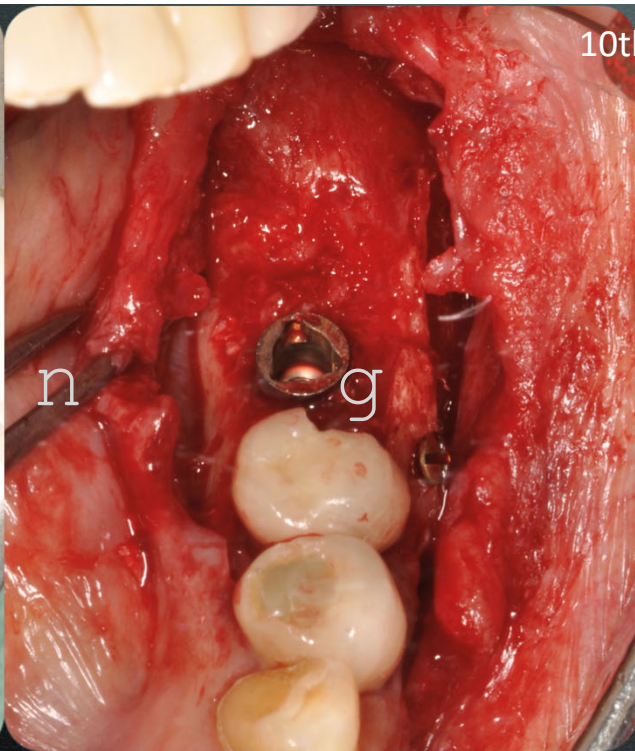
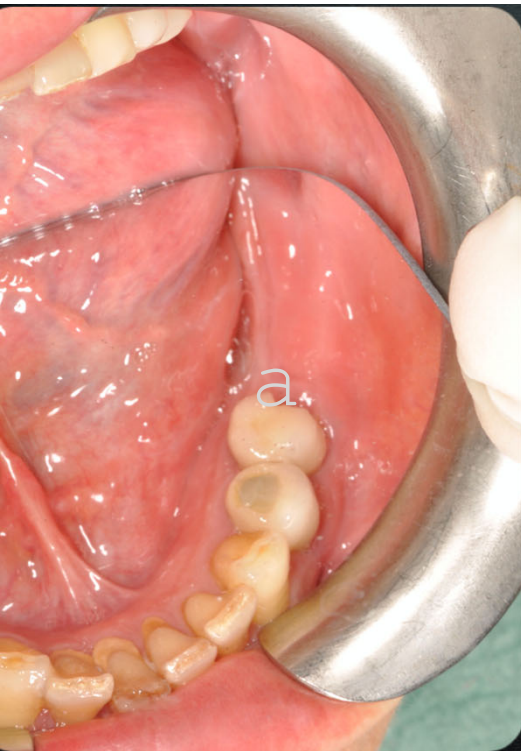
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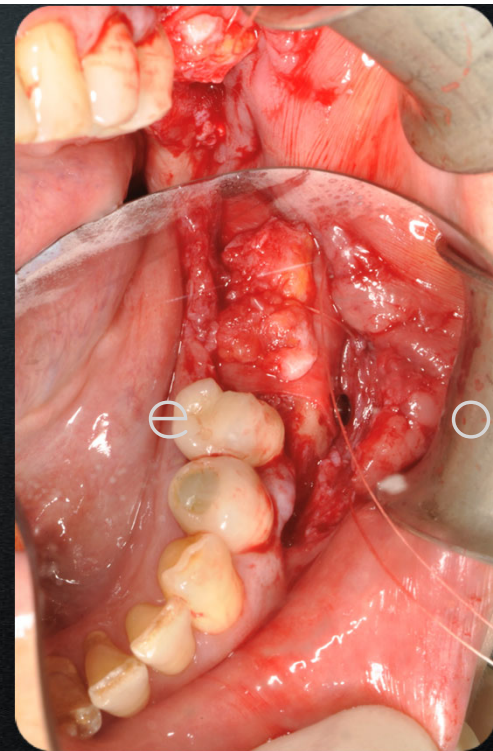
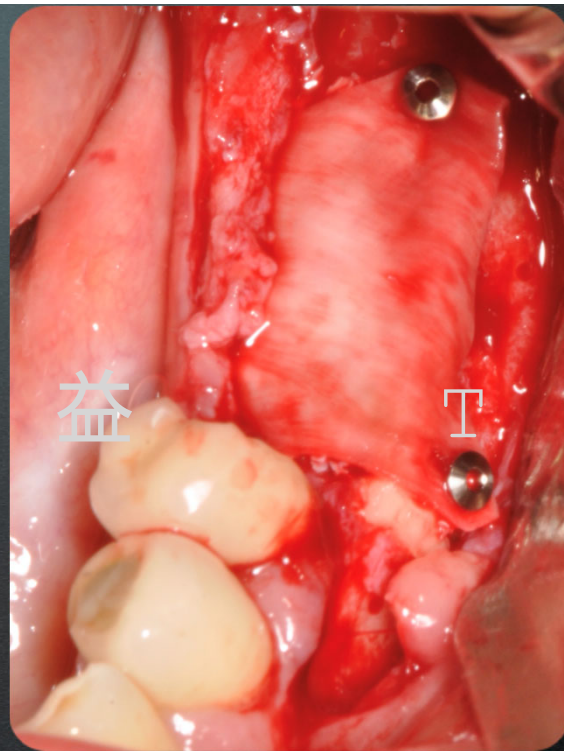
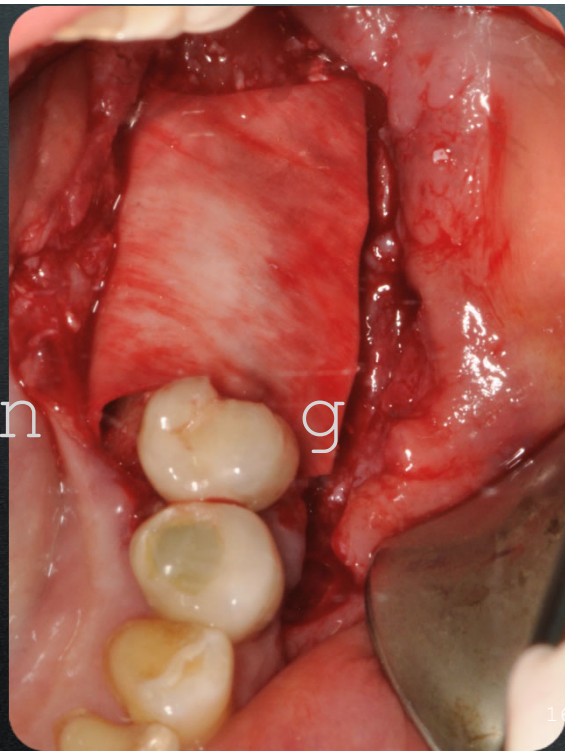
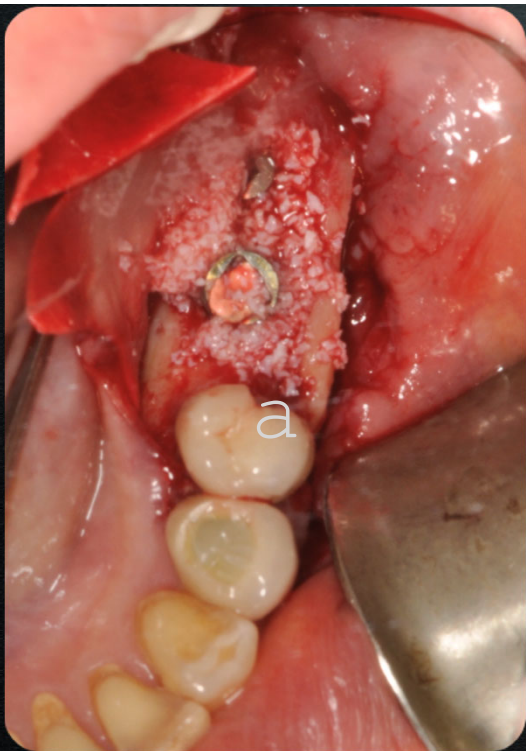
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**TABLE 2** Distribution of Bone Loss in Each Group, n (%)

Bone Loss (mm)	After 2 Months	After Restoration	After 1 Year
<b>Thin tissue</b>			
0	3 (7.5)	1 (2.5)	0 (0)
0.1–0.5	9 (22.5)	4 (10)	2 (5)
0.51–1.0	19 (47.5)	27 (67.5)	11 (27.5)
1.01–1.5	3 (7.5)	3 (7.5)	11 (27.5)
>1.5	6 (15)	5 (12.5)	16 (40)
<b>Thick tissue</b>			
0	24 (60)	20 (50)	20 (50)
0.1–0.5	12 (30)	14 (35)	14 (35)
0.51–1.0	3 (7.5)	5 (12.5)	5 (12.5)
1.01–1.5	1 (2.5)	1 (2.5)	1 (2.5)
>1.5	0 (0)	0 (0)	0 (0)

**TABLE 1** Crestal Bone Loss in Each Group

Group 1	Mean*	Max	Min	Median
After 2 months	0.76 mm	2.1	0.0	0.72
After restoration	0.97 mm	3.70	0.1	0.8
After 1 year	1.18 mm	2.1	0.1	1.2
<b>Group 2</b>				
After 2 months	0.17 mm	1.1	0.0	0.0
After restoration	0.21 mm	1.1	0.0	0.05
After 1 year	0.22 mm	1.1	0.0	0.00

\*Statistically significant differences between thin and thick soft tissue groups were recorded at all measurement time points ( $p = .001$ ).

**Soft tissue thickness** plays a crucial role in **early bone loss**

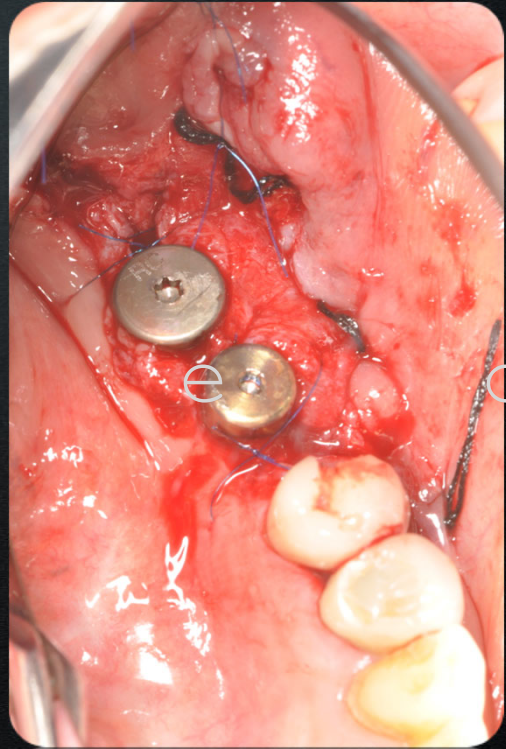
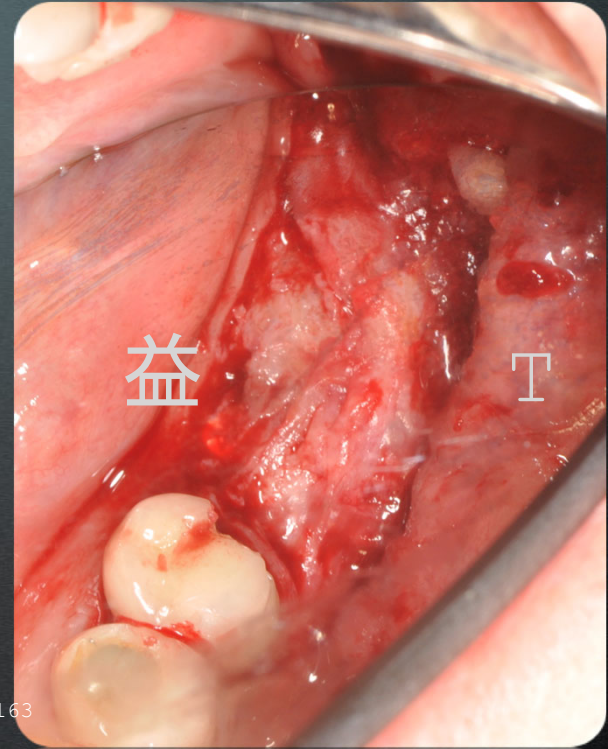
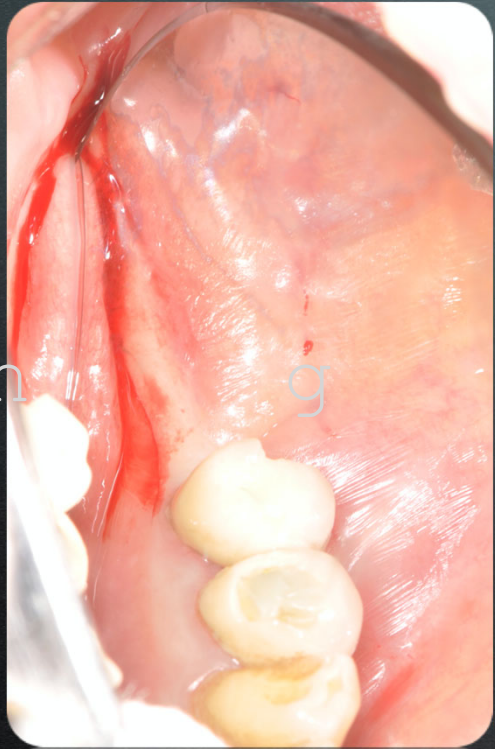
The use of the **switching platform** concept **DID NOT** maintain bone in the cases of **thin** tissues

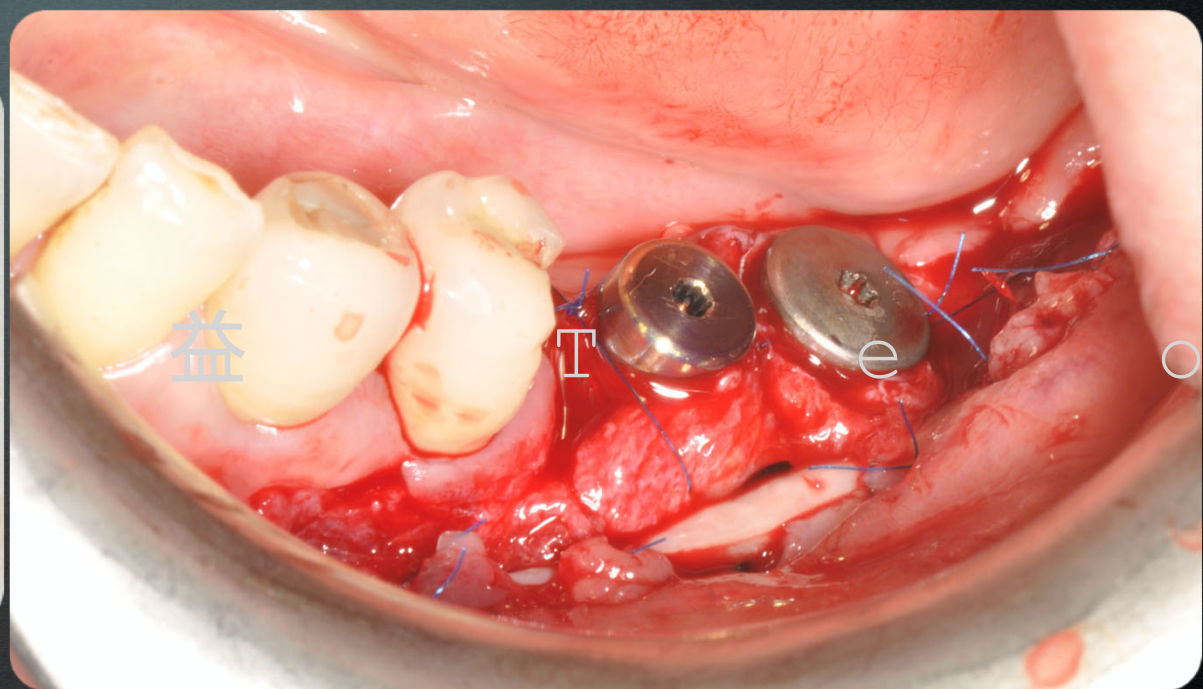
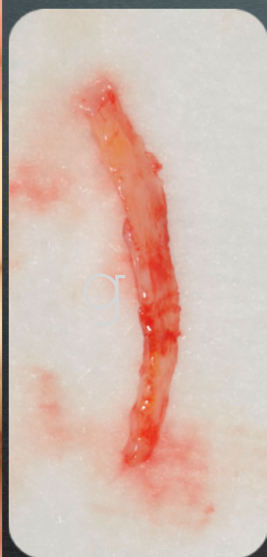
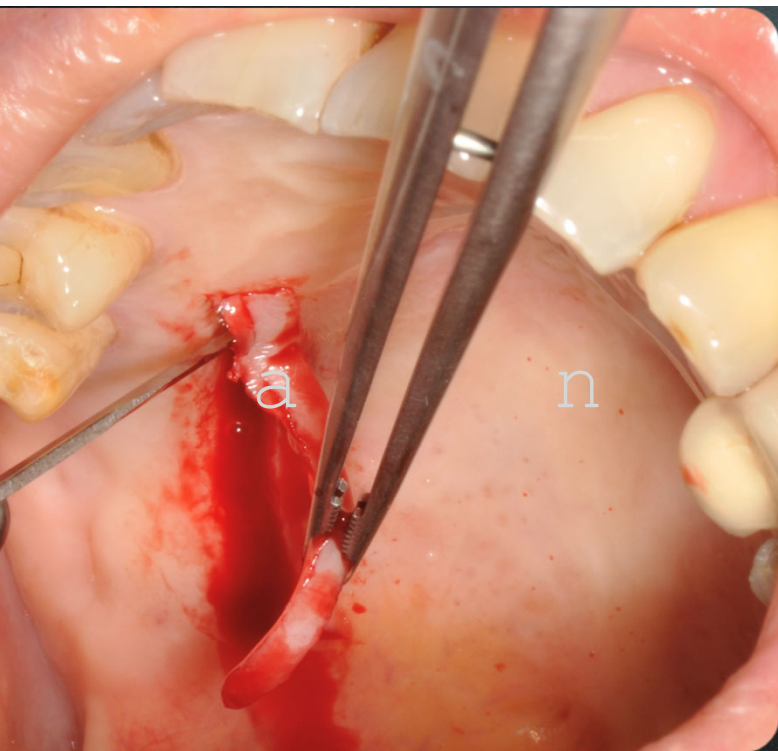
Linkevicius, Pros, Puisys et al. *Clin. Impl. Dent. Rel. Res.* 2014

Influence of vertical soft tissue thickness on crestal bone changes around implants with platform switching: A comparative clinical study

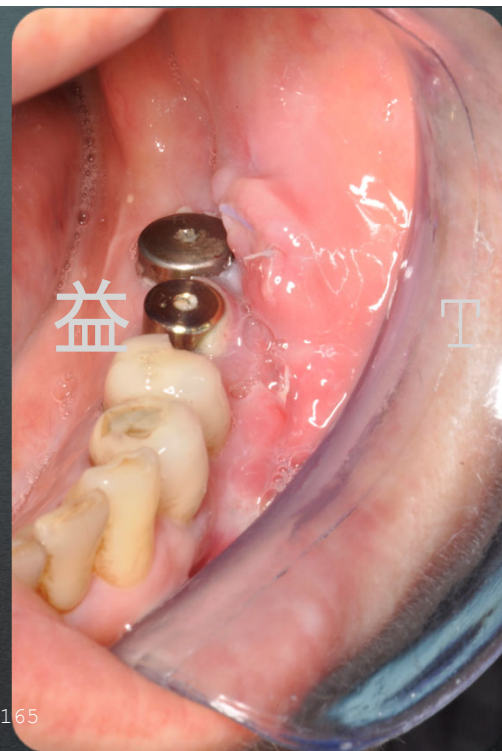
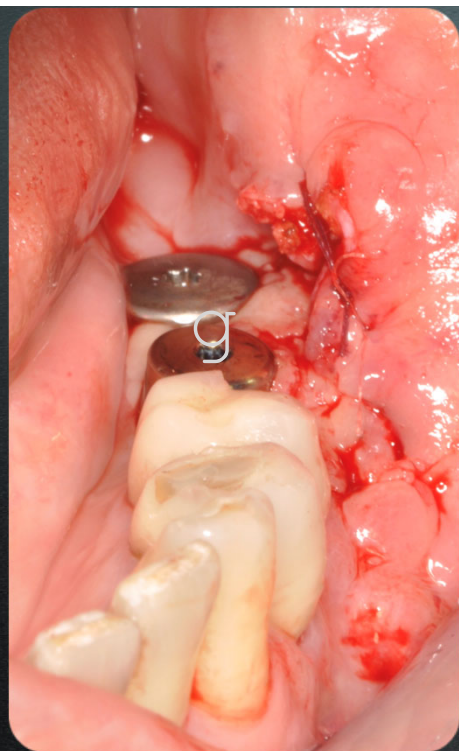


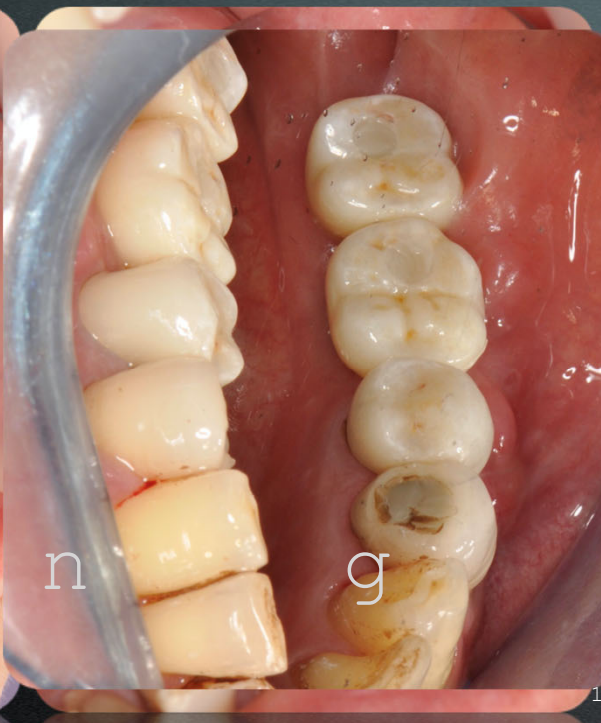
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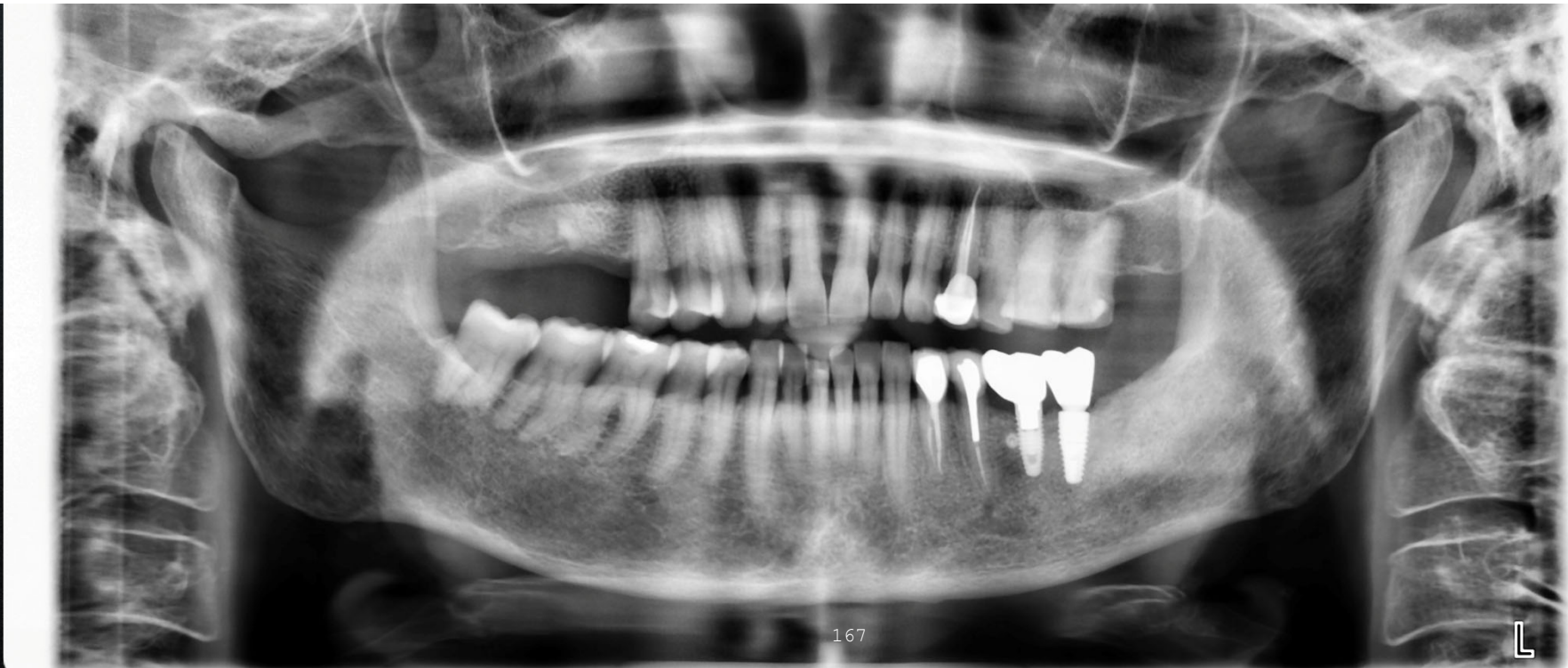






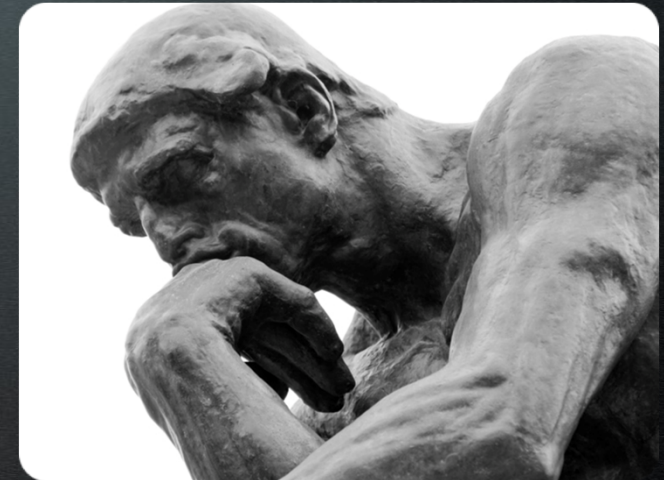






## Lesions learned

- AB = Gold (BMPs, TGFB1, , TGF- $\beta$ 1 etc.) Synergy.
- Rate of revascularization is the key.
- AB graft has a better chance against any infection than any other biomaterial.

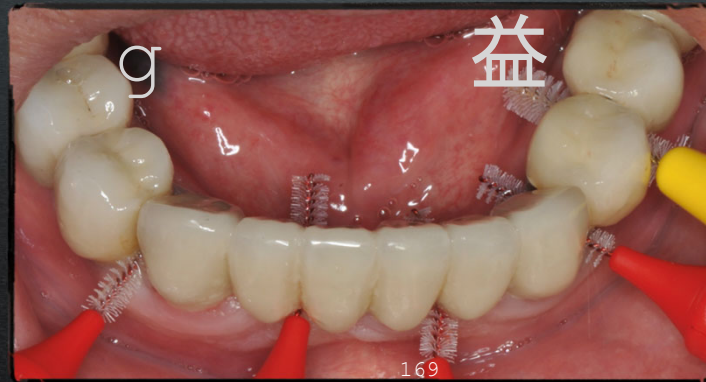




## Maintenance

No Treatment is complete without  
an ongoing maintenance protocol

Restoration contour must allow  
Access for ID Brush cleaning



Complications & Failures  
no one likes them  
learn from them



Don't judge me by my successes, judge me by how many times I fell down and got back up again.

Nelson Mandela

Success is not final. Failure is not fatal. It is the Courage to Continue that COUNTS.

Winston Churchill

Ever Tried. Ever Failed. No Matter. Try Again. Failed again. **Failed better.**

Samuel Beckett, Stan Wawrinka (2016 AO  
Champion)

Your attitude, Not your aptitude, will determine your altitude

Zig Ziglar

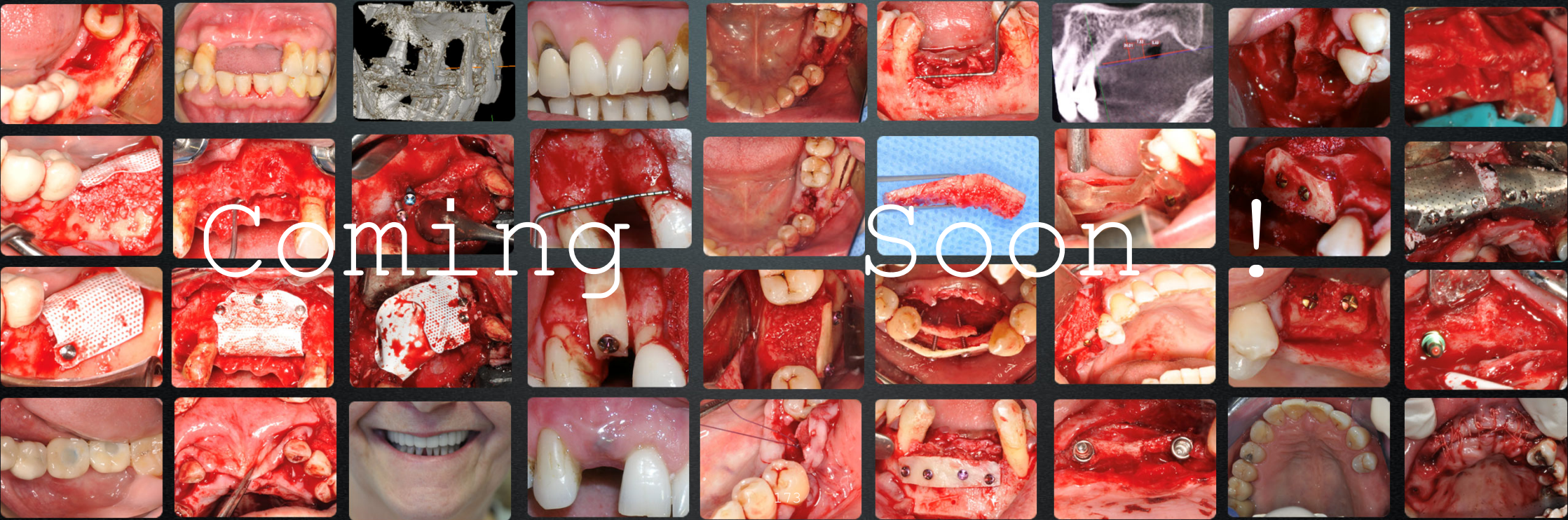
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Coming Soon!