

Complications in Implant Dentistry: My Experience

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Implant Dentistry is a Journey
Complications is part of it!

My Journey, so far...

Something happened, “usually unexpected” , that introduces difficulty or problem which require extra effort or measure to overcome.

Implant complications

Biological

- Failure to integrate
- Unfavourable position
- Implants migration
- Damage to vital structures
- Infection
- Mucositis
- Peri-implantitis + bone loss
- Aesthetic
- etc.

Mechanical

- Screw loosening
- Fracture abutment
- Fracture screws
- Components misfit
- Inaccurate
- Fractured substructure
- Fracture veneering material
- etc.

Implant complications (stage/timing)

- Immediate Complications: Detected during the procedure.
- Early Complications: Detected during the healing phase; or at graft/implant exposure.
- Late Complications: Detected once the implant has been restored.



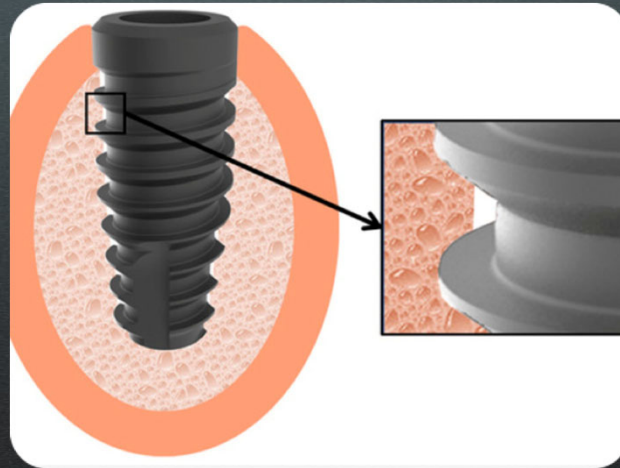
Topics to be covered (2.5 hours)

- Implant malpositioning
- Missing buccal plate
- Soft tissue perforation
- Wound Dehiscence
- Failure of Immediate implant
- Compromised aesthetics
- Graft resorption
- Peri-implantitis (removal or regeneration)



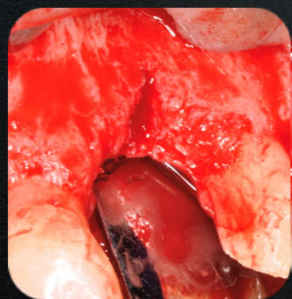
Clinical cases & reflections

In The Past

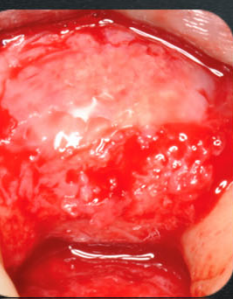


Osseointegration = Successful treatment

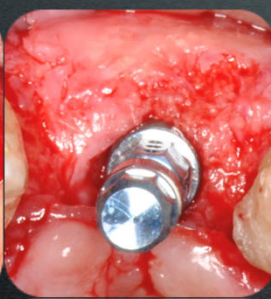
Current requirements for Successful Implant Treatment is more than osseointegration: Respect Biology



Sufficient bone volume



Increased bone volume
With different techniques



2-4mm of bone
surrounding
the implant in correct
3-D position

Urban I. 2005
Buser D. 2005



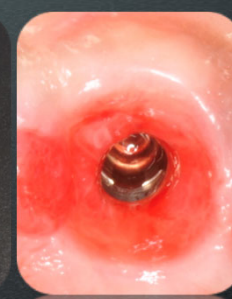
Sufficient soft tissue
Crestal and buccal

Spray J.R. 2005
Grunder U. 2005



Biological emergence profile

Jung J.R. 2015 8

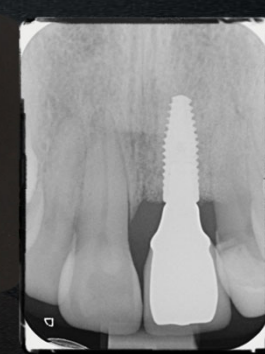


4mm thickness
soft tissue;

Linkevicius T. 2009, 2014



Screw retained
Avoid cement &
restorative material
Highly polished Zirconia
on tissue surface





Lopsided Pillar !

Clinical Case 1 (Feb 2011)

- Healthy 58 year old Chinese (Tiawan) lady: (Nan)
- Main complaint: jiggling or loose implant crown
- Non Smoker
- Received implant in 11 area in Buenos Aries, Argentina (frequent traveller)
- Class I incisal relationship
- Medium lip line
- Thin Biotype
- Frenum present
- Inflamed peri-implant tissue with BOP
- 11 metal ceramic crown with pink porcelain





Treatment plan

Stage 1

- Removal of malpositioned implant with Piezotome.
- Pedicle palatal CT Graft to improve soft tissue volume.
- Temporary removable denture.
- Wait 2 months.

Stage 2

- Ridge augmentation with G.B.R. technique (Cytoplast Ti reinforced membrane).
- Autogenous bone chips from mandible.
- Wait 4 months.

Stage 3

- Implant placement in correct 3 D position.
- Wait 2 months .

Stage 4

- Implant exposure.
- Connective tissue graft.
- Temporary restoration on implant.
- Soft tissue development .
- Wait 2-3 months.
- Final restoration (screw-retained).

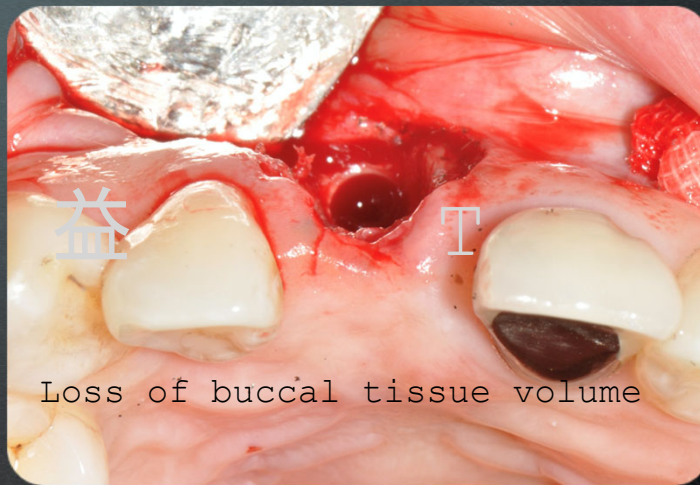
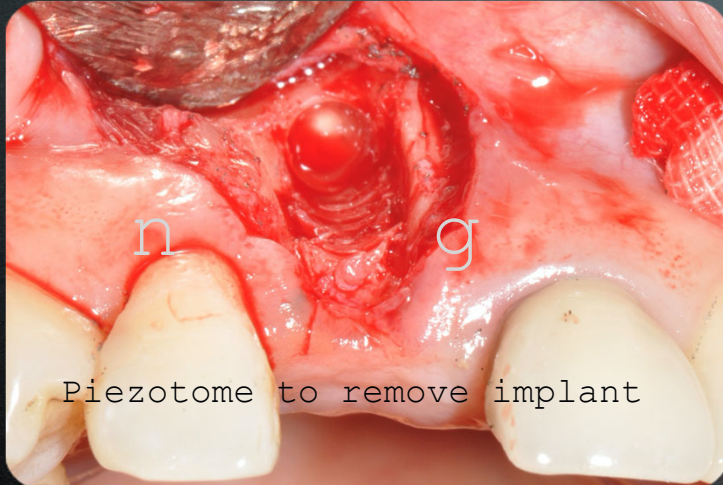
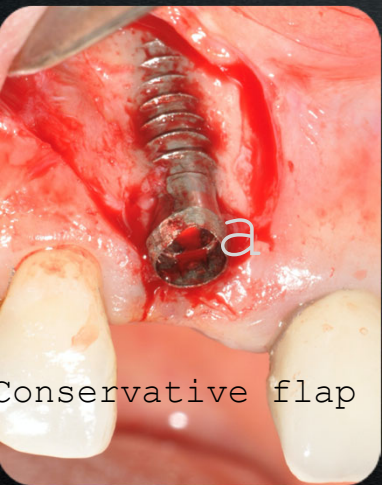
CICT1

12th April 2011



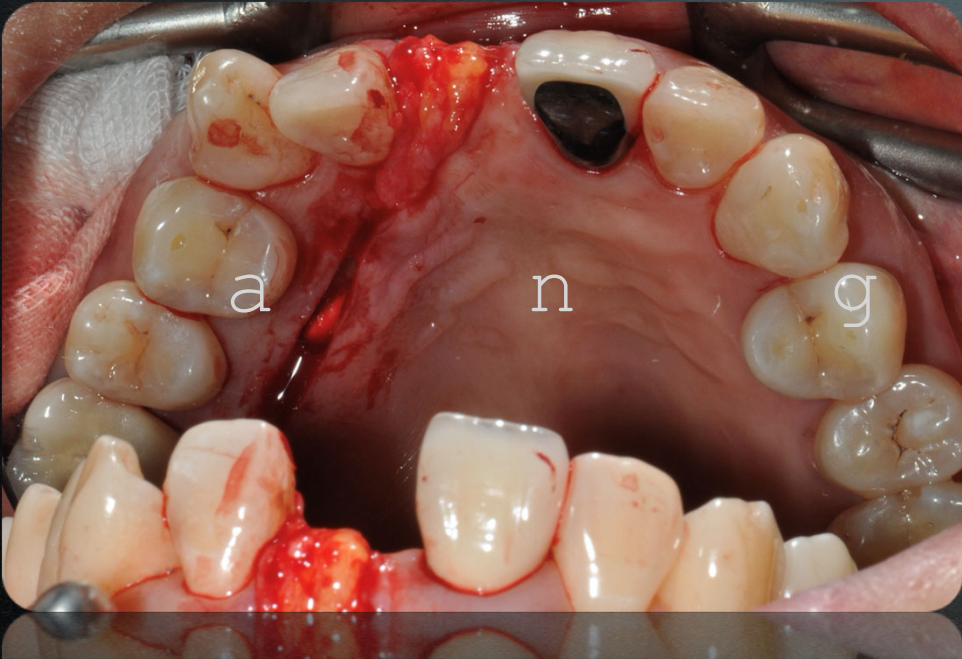
- CICT1** Wrong 3 D implant position
 - Too far labial and apical
 - Unfavourable biomechanics
- Chang I Chun Teoh, 13/12/2019

12th April 2011

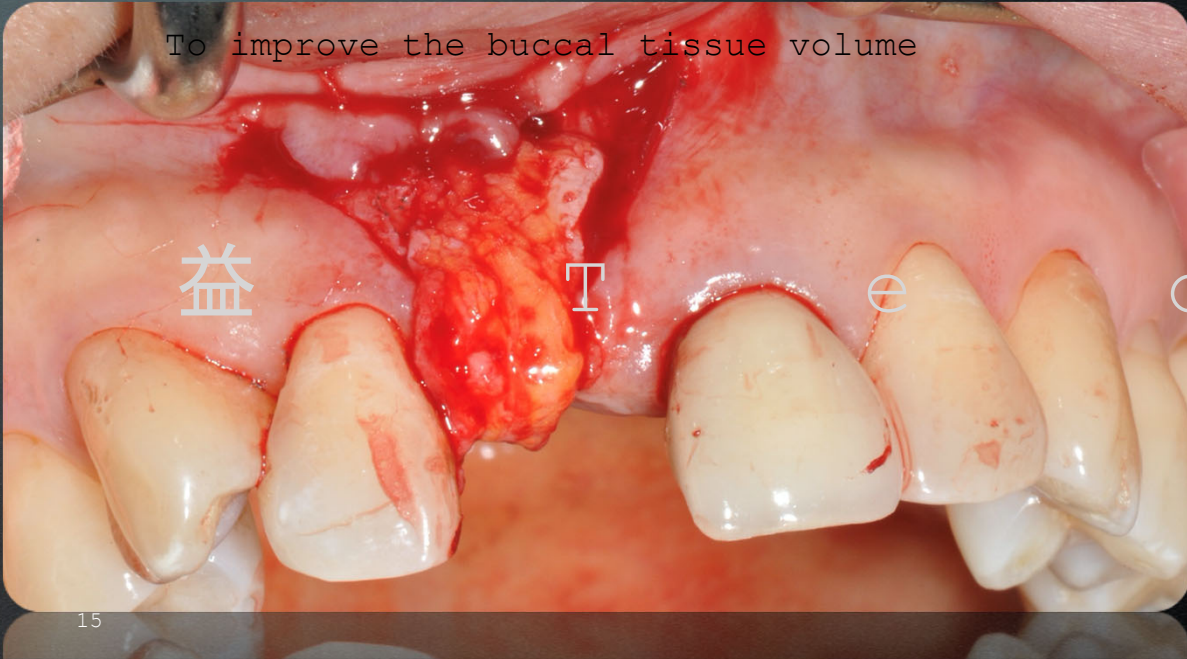


Palatal Rotated Connective Tissue Flap

CCT2



To improve the buccal tissue volume

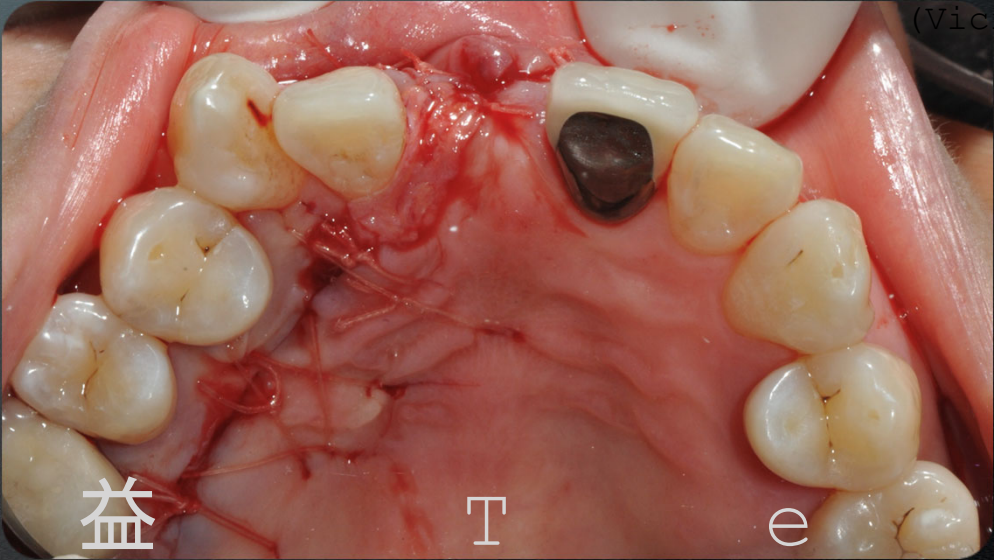
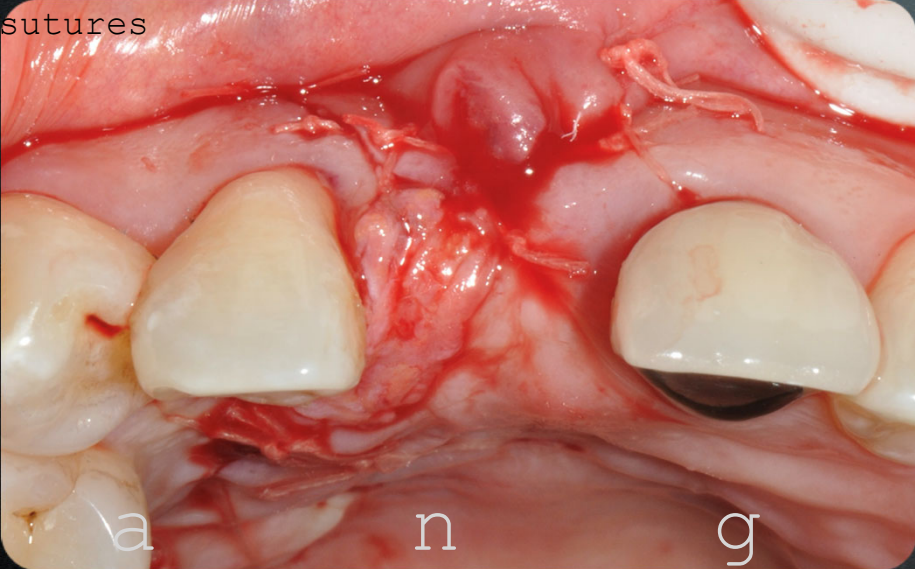


Slide 15

CICT2 Pedicle CT graft to increase soft tissue volume (prepare for future augmentation)

Chang I Chun Teoh, 13/12/2019

12th April 2011



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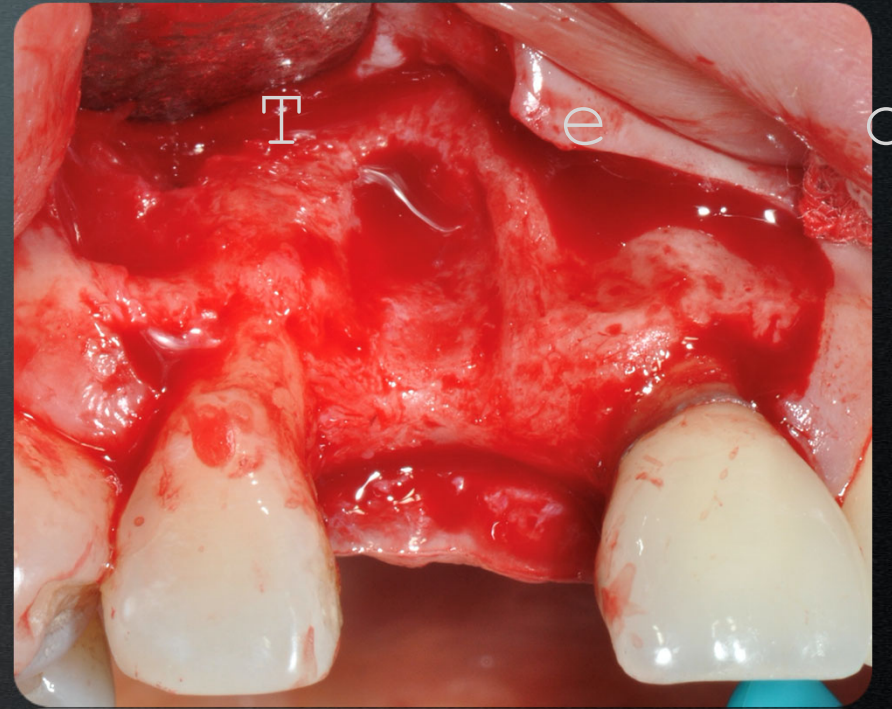
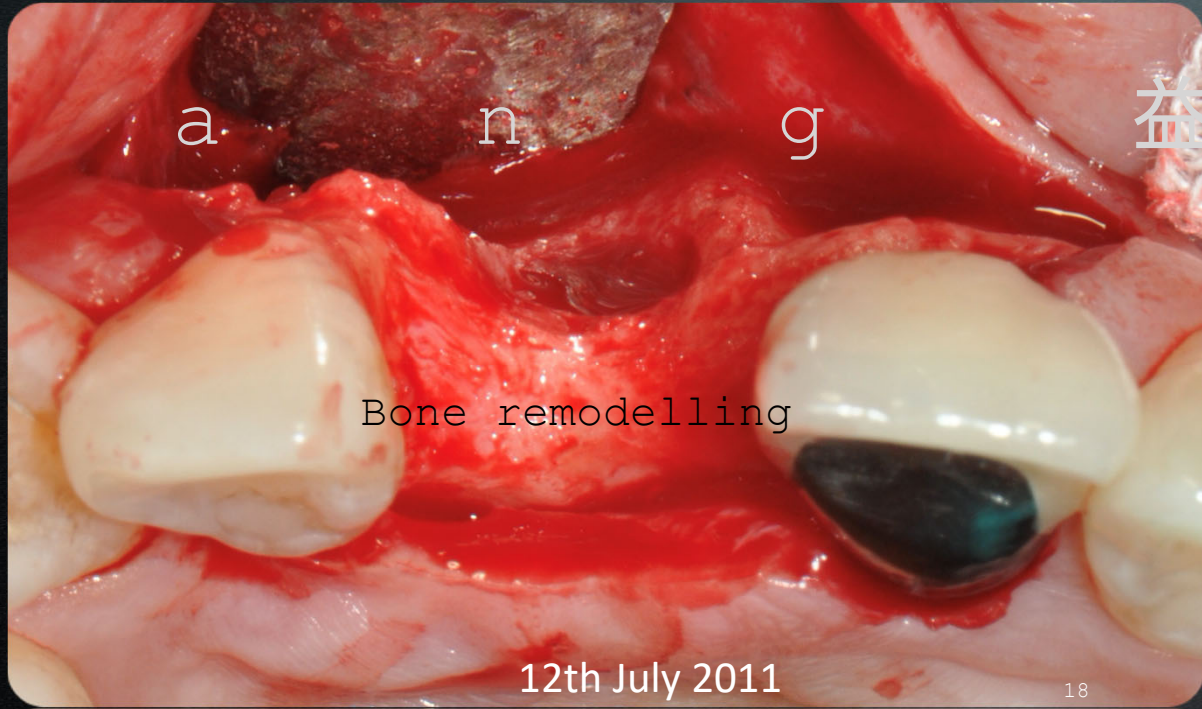
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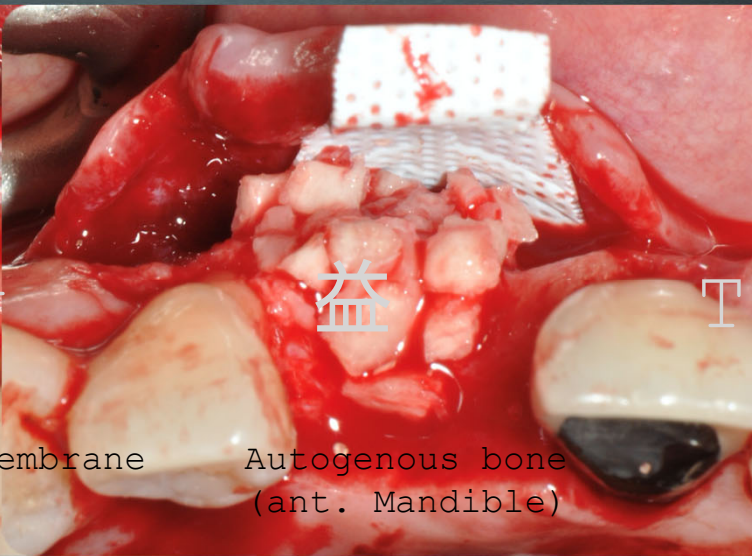
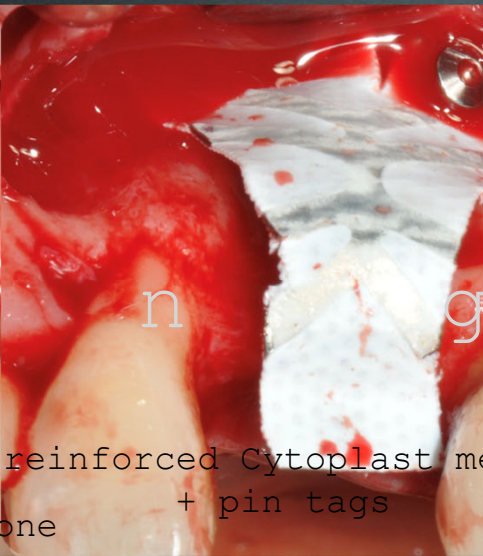
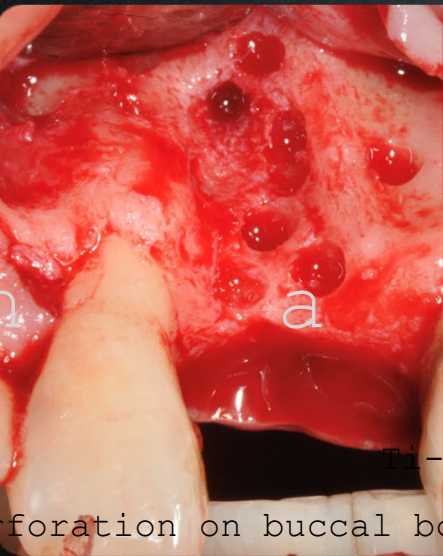
19th April 2011

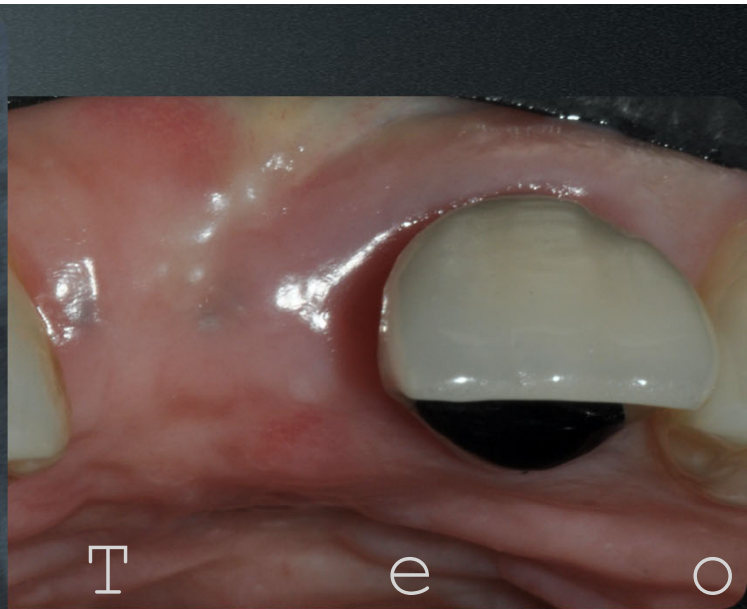
3 months

12th July 2011









22nd november 2011

Papillae

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Pseudoperiosteum

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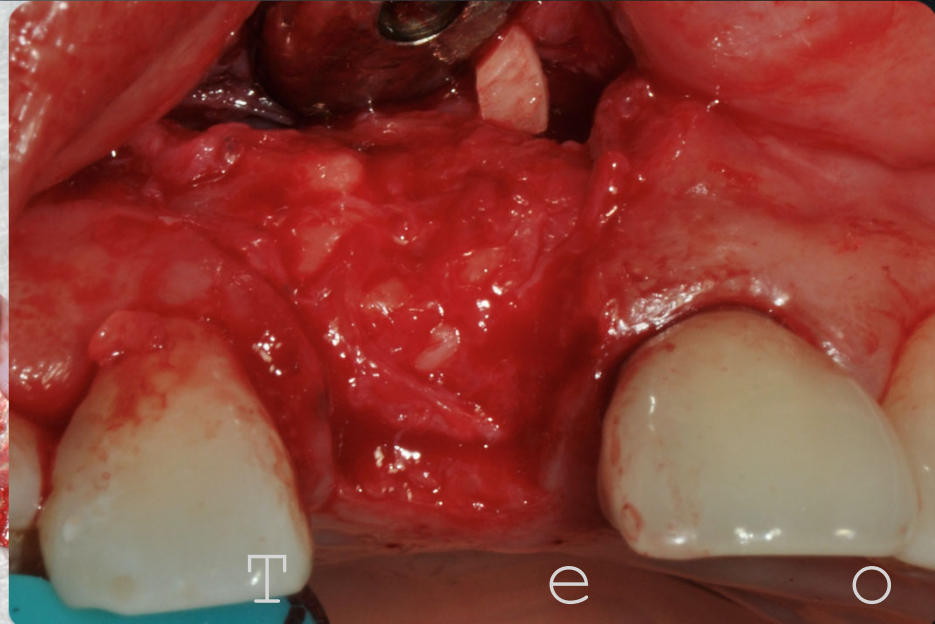
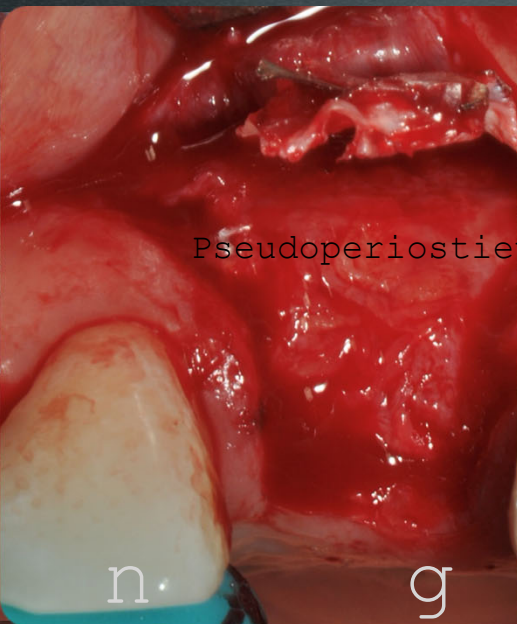
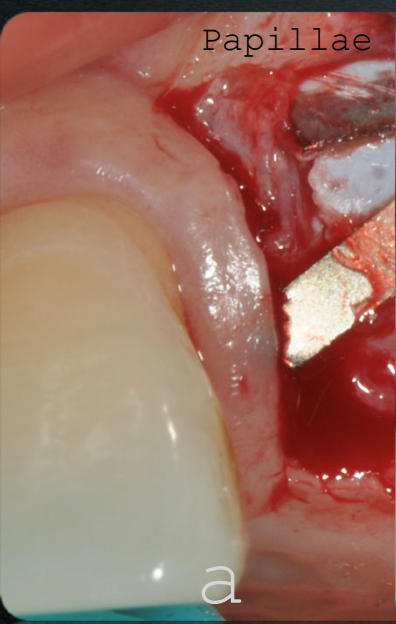
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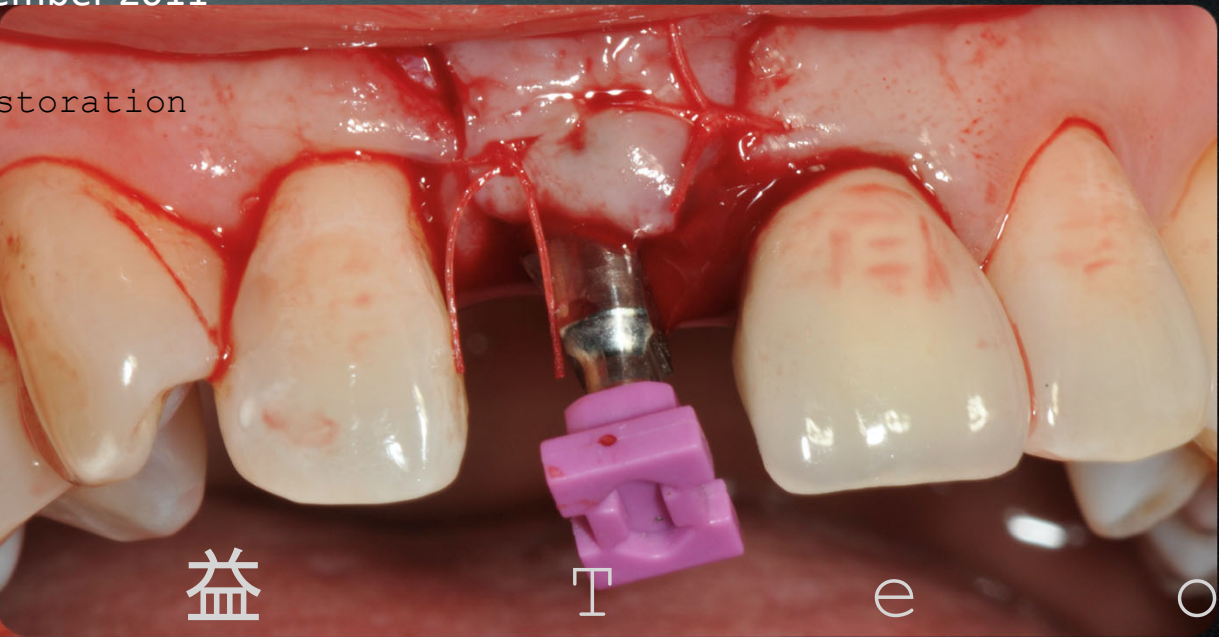
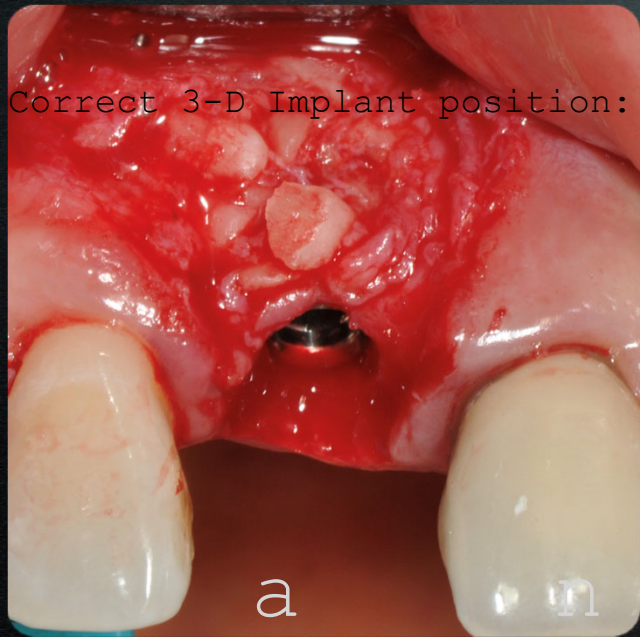
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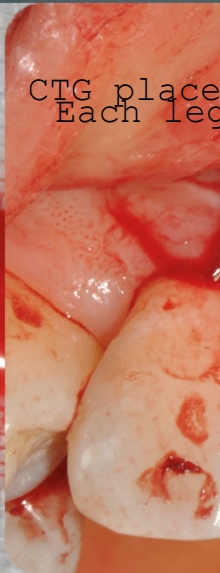
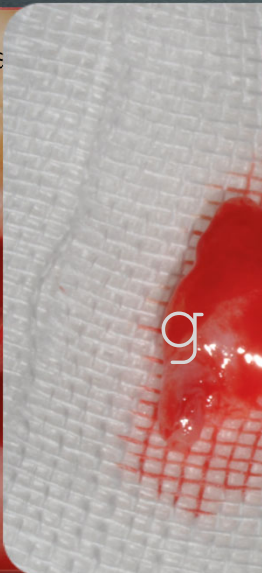
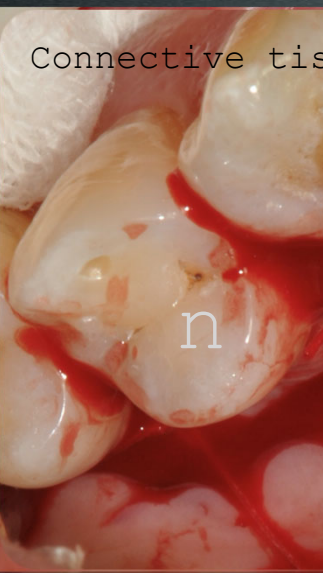
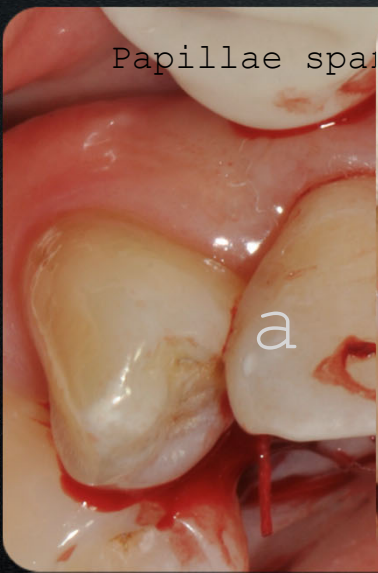
22nd November 2011

Correct 3-D Implant position:

Screw-retained restoration



10th January 2012



Provisional crown fitted on the day of exposure

28th March 2012



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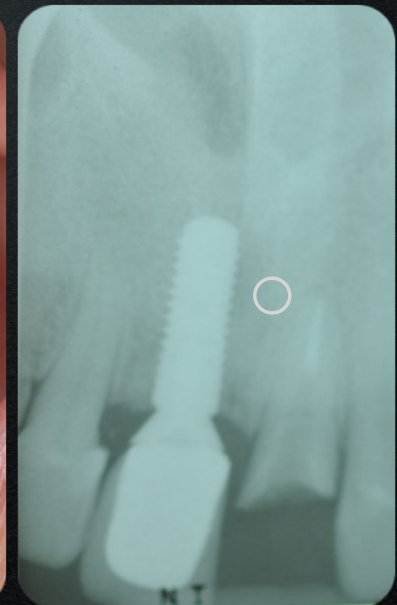
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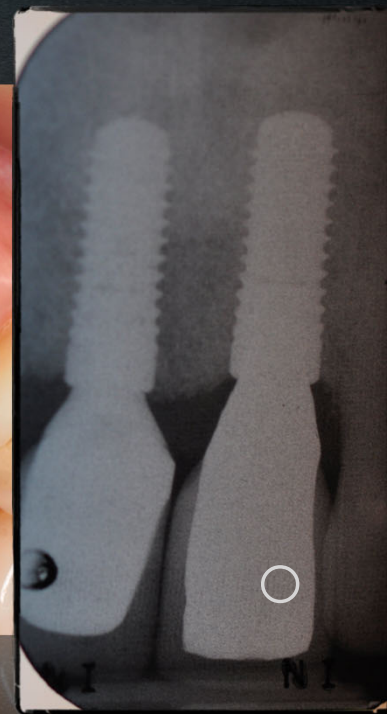
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2nd April 2012



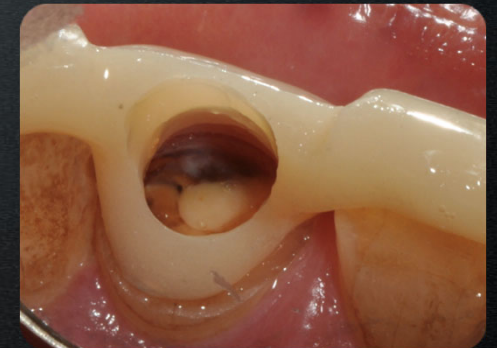
5th May 2015





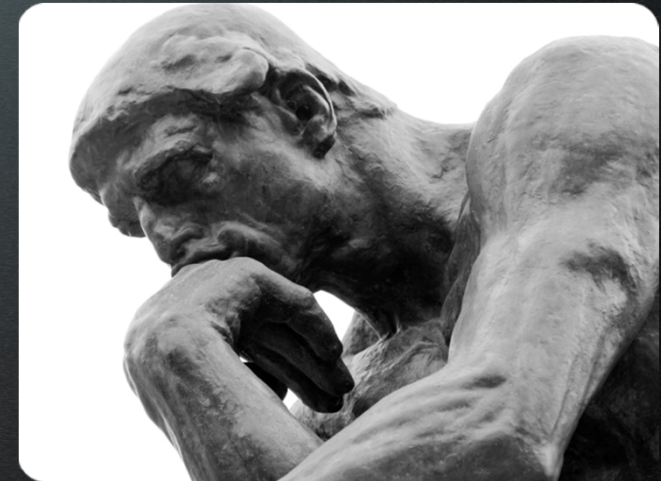
How to avoid lopsided implant ?

1. Place implant with your eyes closed T/F
2. Place implant where the bone is T/F
3. Ask your assistance to guide you along T/F
4. Use a surgical guide (digital or analogue) T/F



How would I do it today?

- Would use Bonescraper to harvest bone chips from external oblique ridge rather than chin area
- Pin tags may be used to secure the collagen membrane
- Use digital surgical guide & BLT implant
- Screw retained restoration
- Ti base and Zirconia abutment; porcelain or lithium disilicate crowns





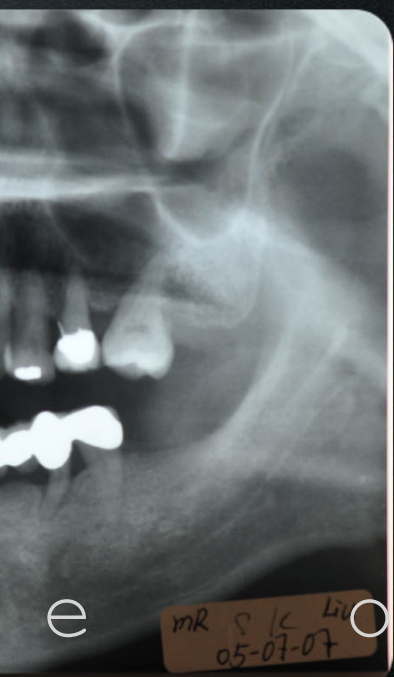
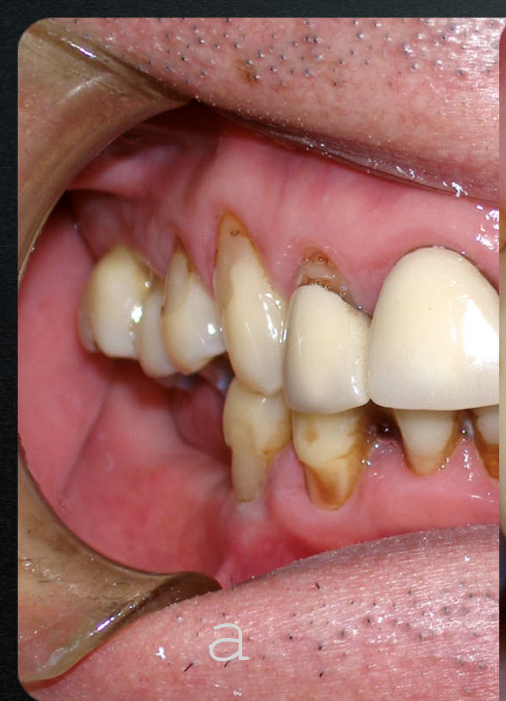
Oops - Something is missing !!!!!

Clinical Case 2 (Sept 2008)

- Healthy 62year old Chinese gentleman:
(K.S) London
- Main complaint: loose 21
- Non Smoker
- Periodontal compromise dentition
- Class I incisial relationship
- Low lip line
- Medium Biotype
- Oral hygiene: unsatisfactory
- Xtra 21, bone augmentation
- Implant 21 (staged approach)



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27th September 2008



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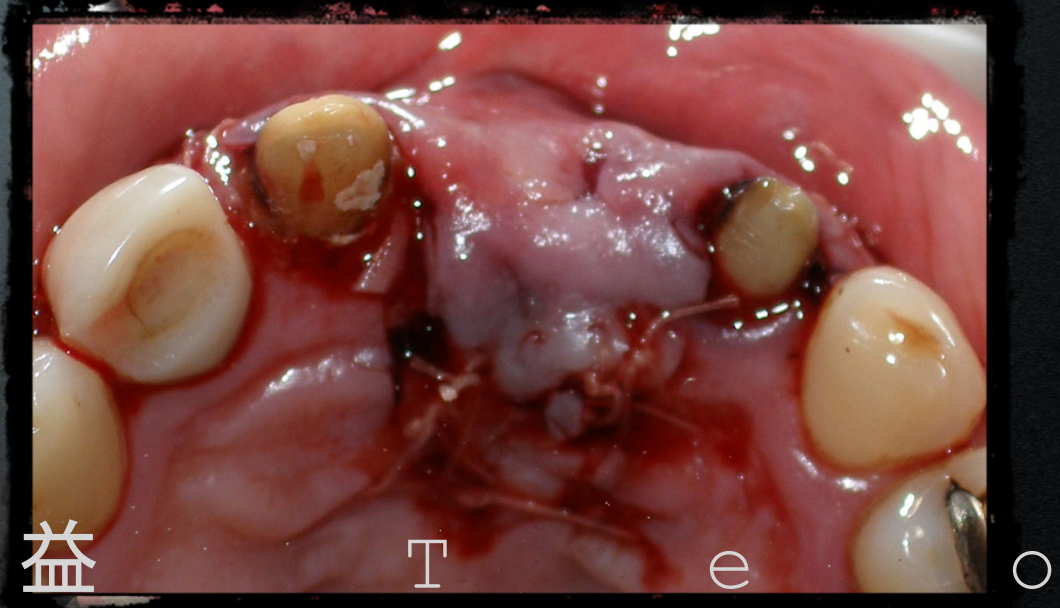
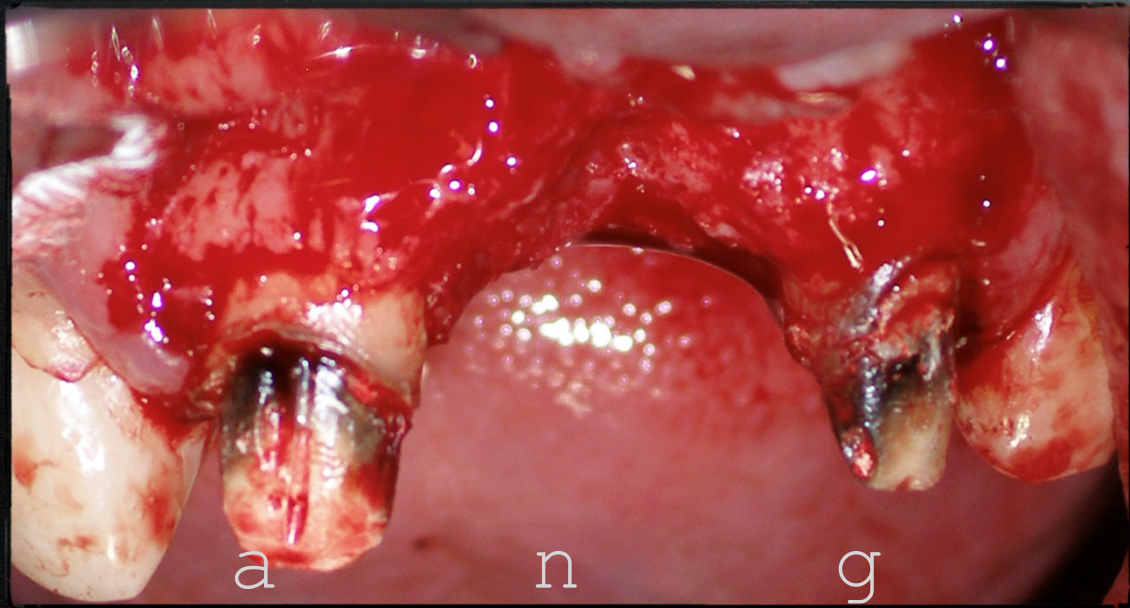
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25th November 2008

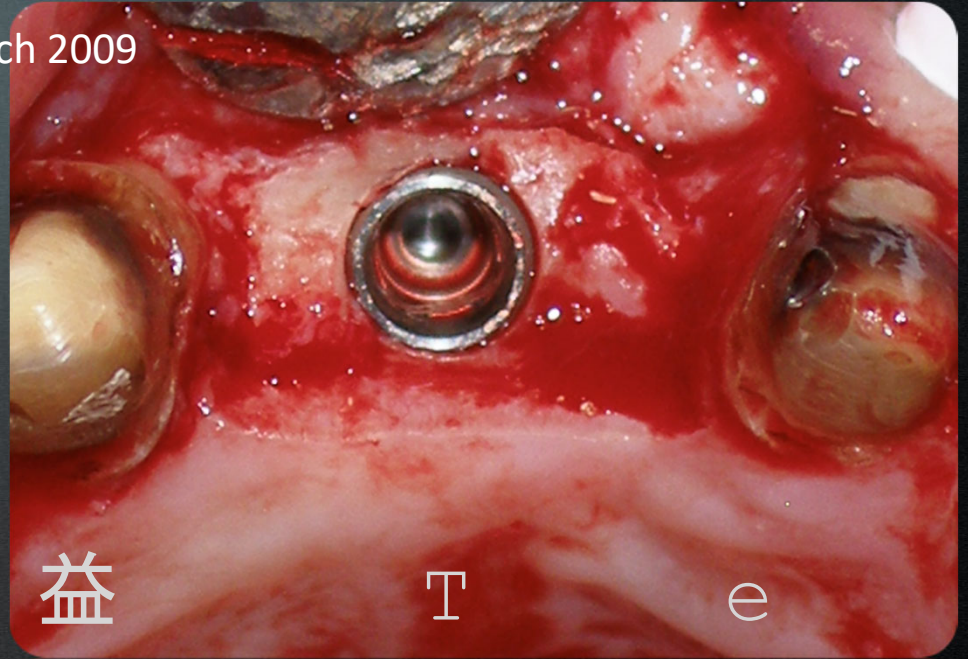
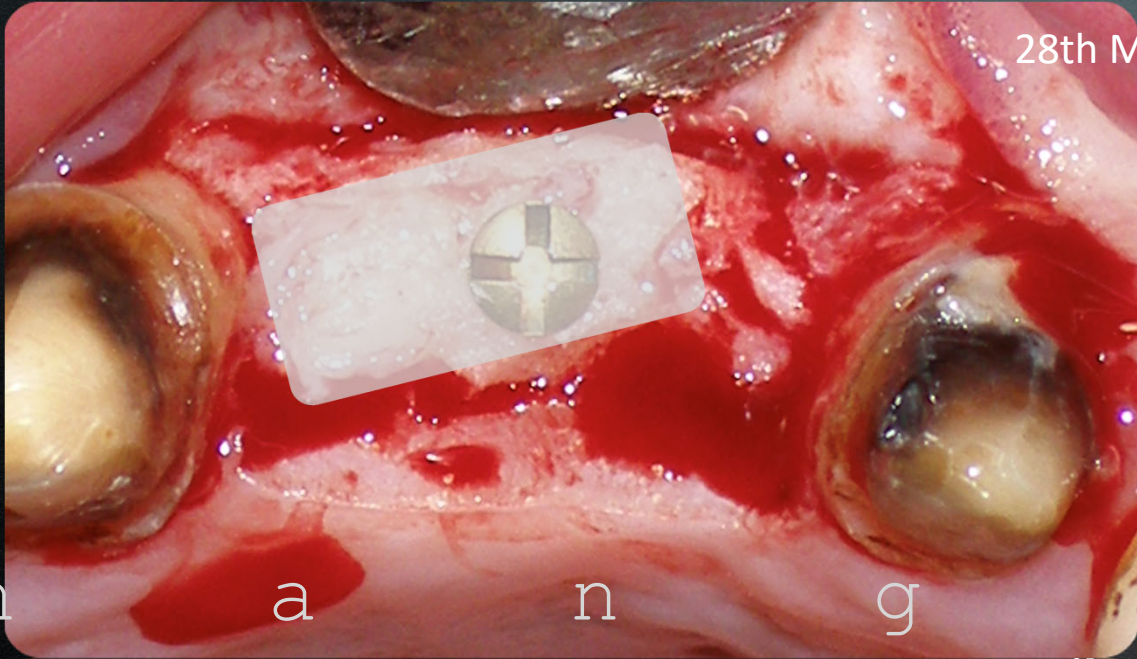




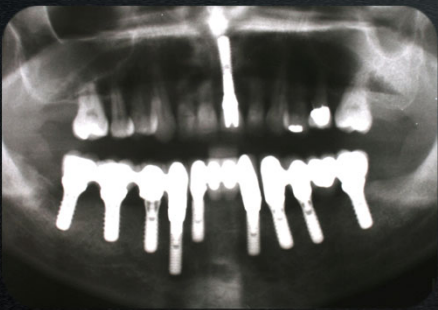
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28th March 2009



13th July 2009



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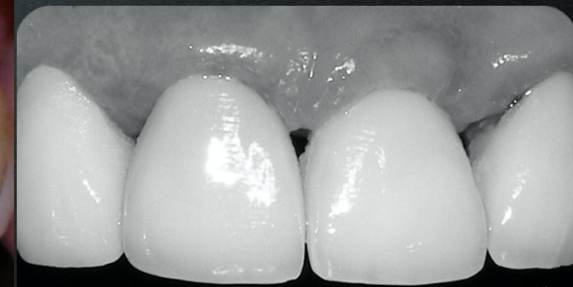


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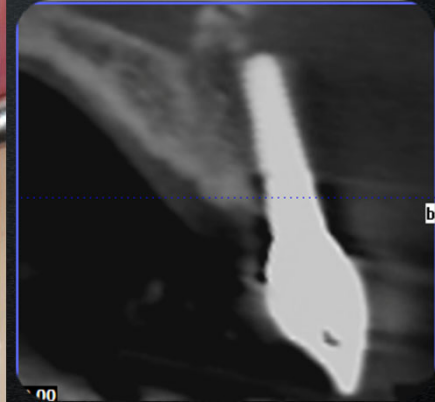
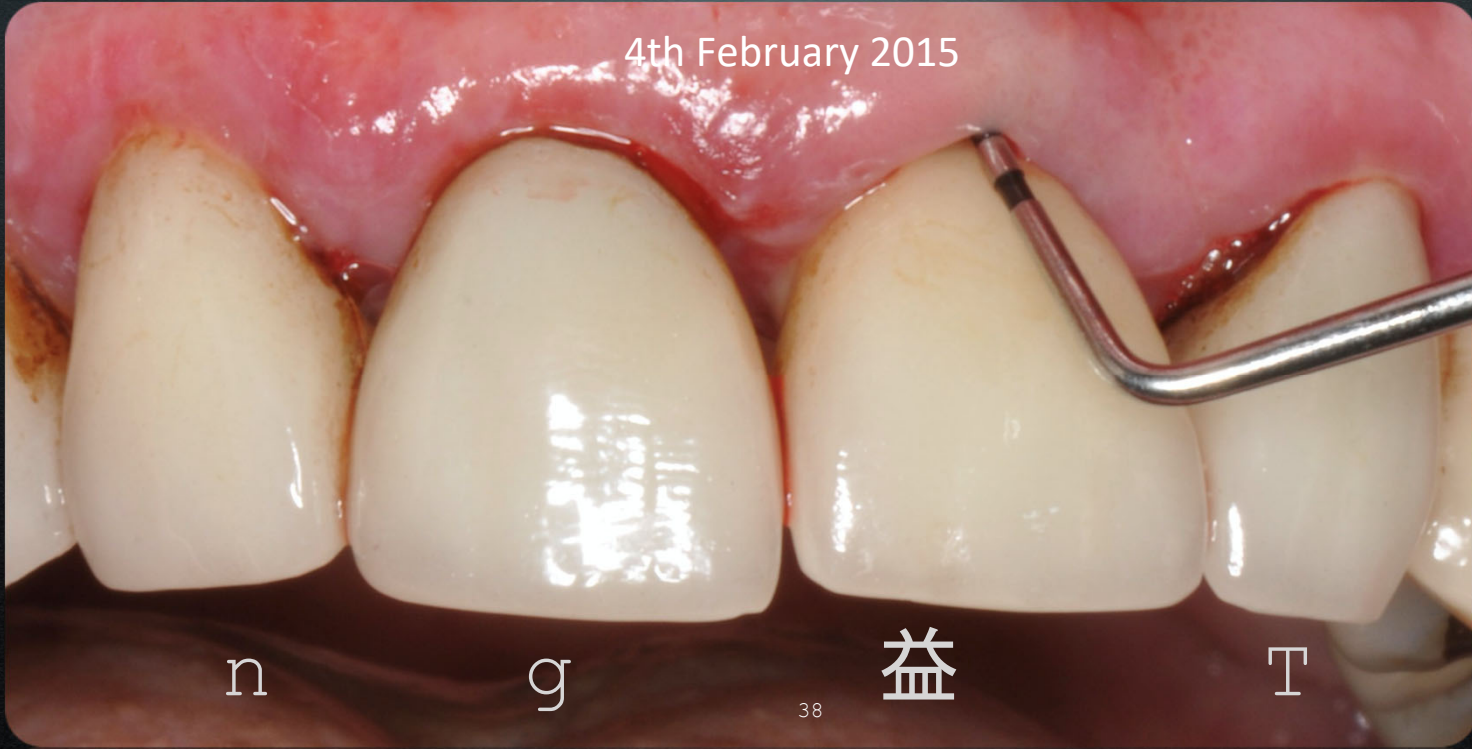
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19th July 2011

4th February 2015



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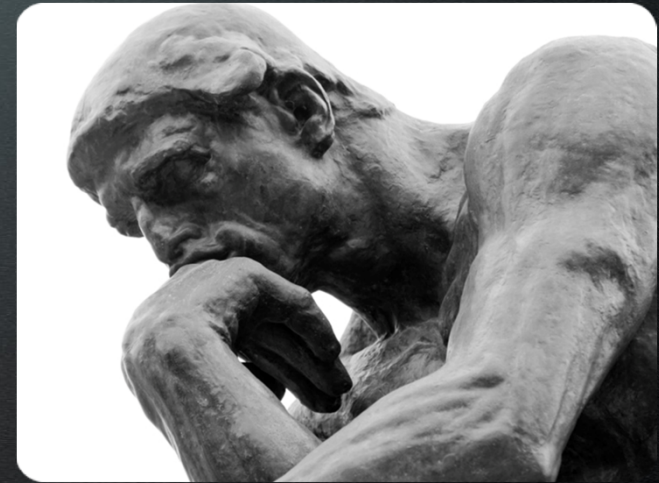
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Lesions learned

- Autogenous block graft may be difficult to revascularise.
- Bone graft has “Ivory” appearance
- Implant placed in a more palatal position (screw retained restoration)
- Consider a smaller diameter (NC) implant
- Consider using 3D Khoury technique (bone lamina + AB chips): much faster revascularisation of the graft (will cover later)





Look at that Button hole !

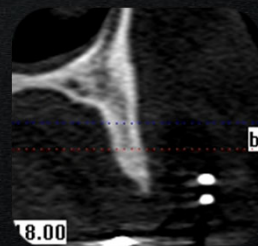
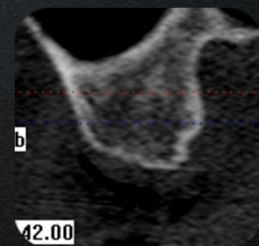
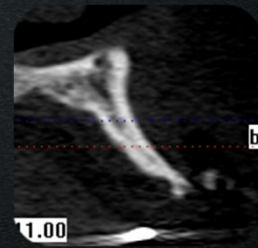
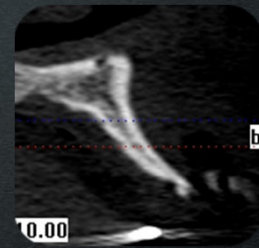
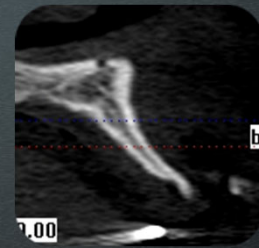
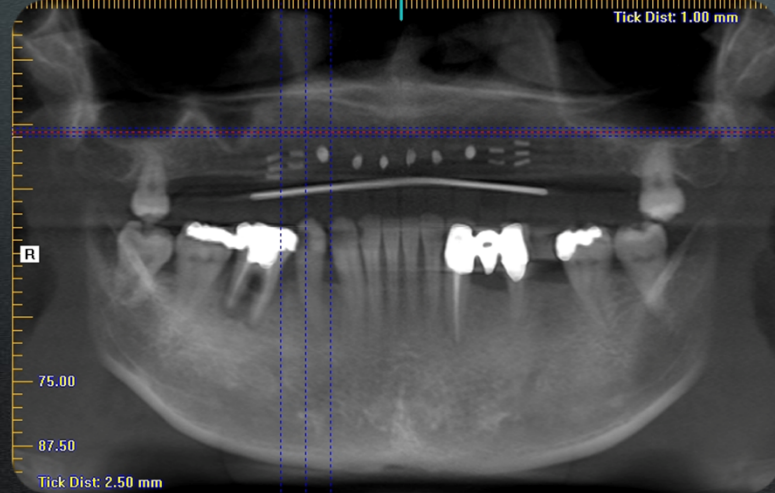
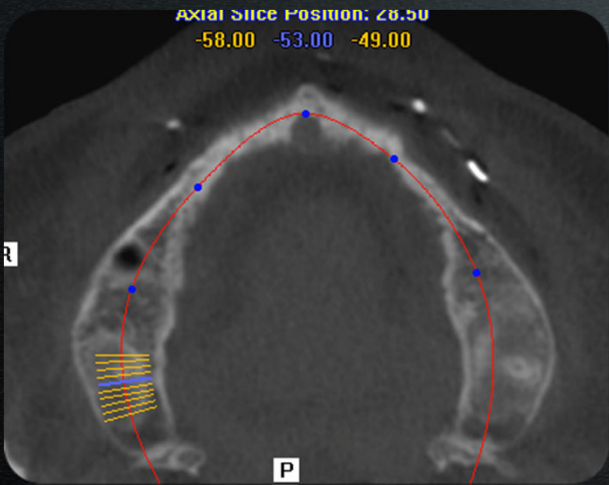
Clinical Case 3 (March 2009)

- Healthy 38 year old Malaysian Chinese gentleman: (Chong) in London
- Main complaint: loose upper denture
- Knife edge anterior maxilla
- Low lip line
- OVD acceptable
- U-shaped Arch
- Thin mucosa



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CBCT SCAN



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Treatment Objectives

To provide adequate bone volume for implant placement

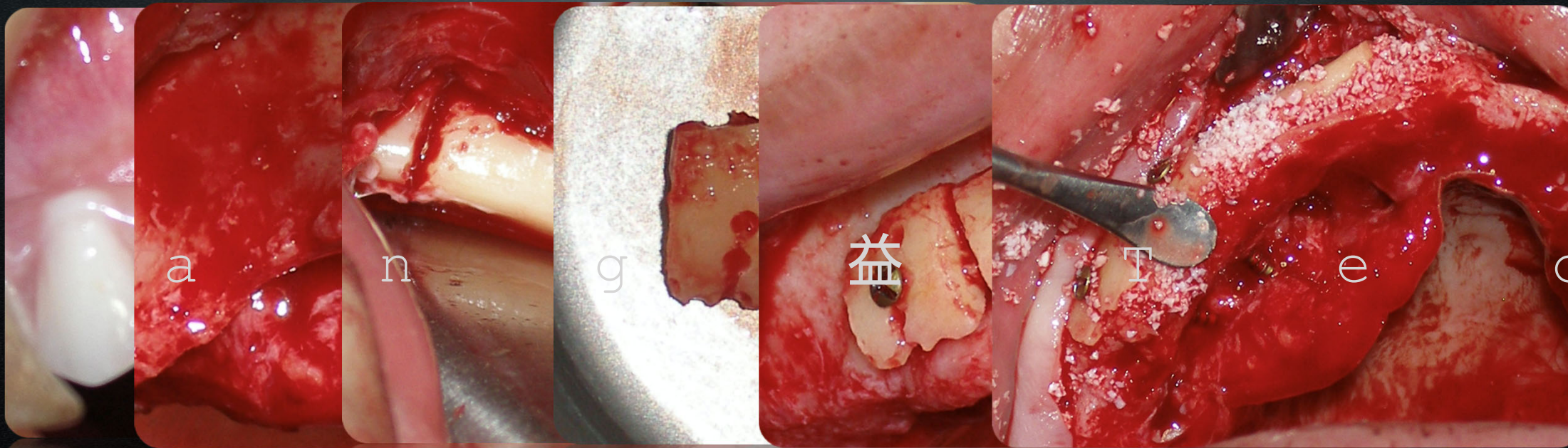
To place implants in anterior and posterior maxilla for fixed restoration

To restore the maxilla with function and aesthetic restorations

Treatment Plan

- CBCT Scan
- Bone Augmentation
- Implant Placement
- Implant Exposure
- Soft tissue surgery
- Provisional Restorations
- Final Restoration (Cement Retained Fixed Bridge)

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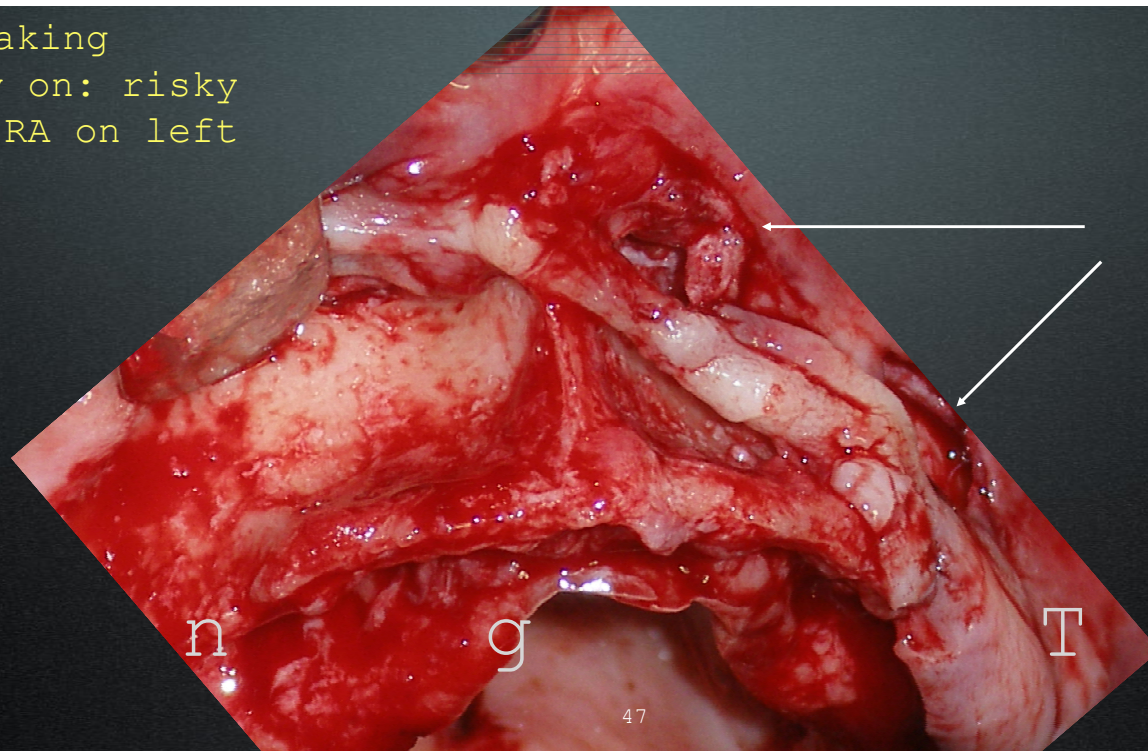
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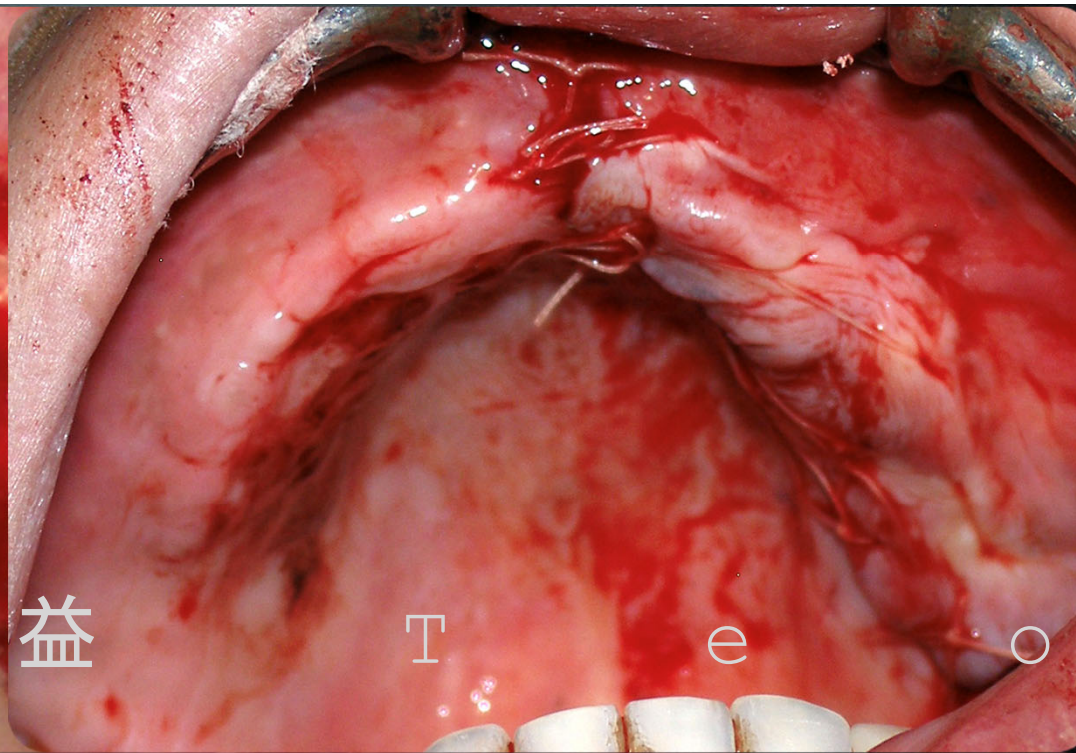
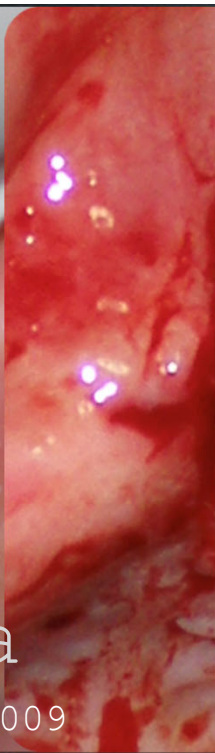
25th March 2009

Decision making
Repair and carry on: risky
Close and abort RA on left
side



Button hole perforation

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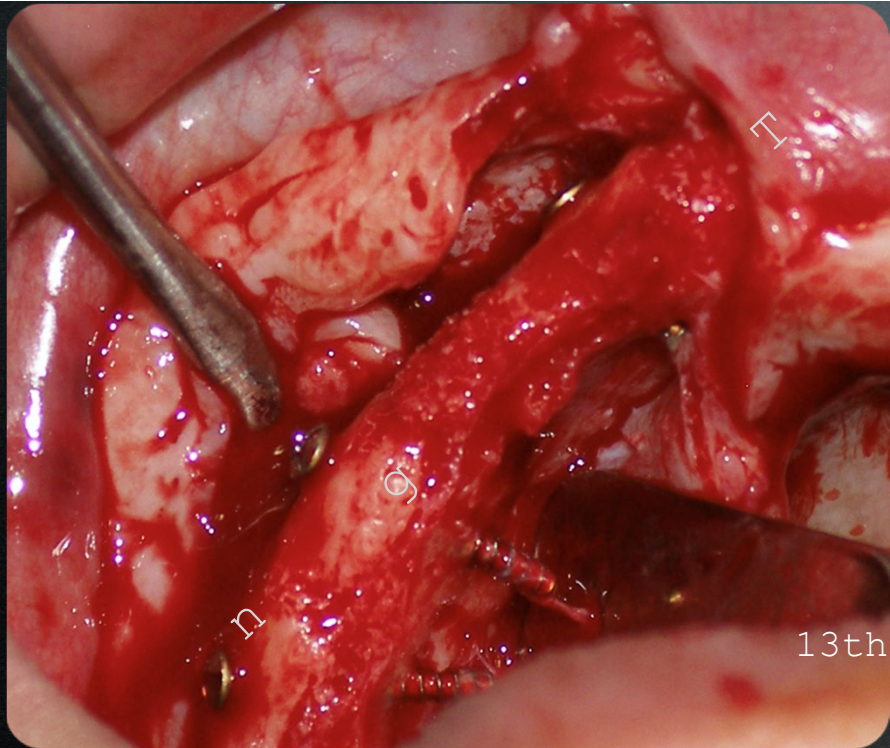
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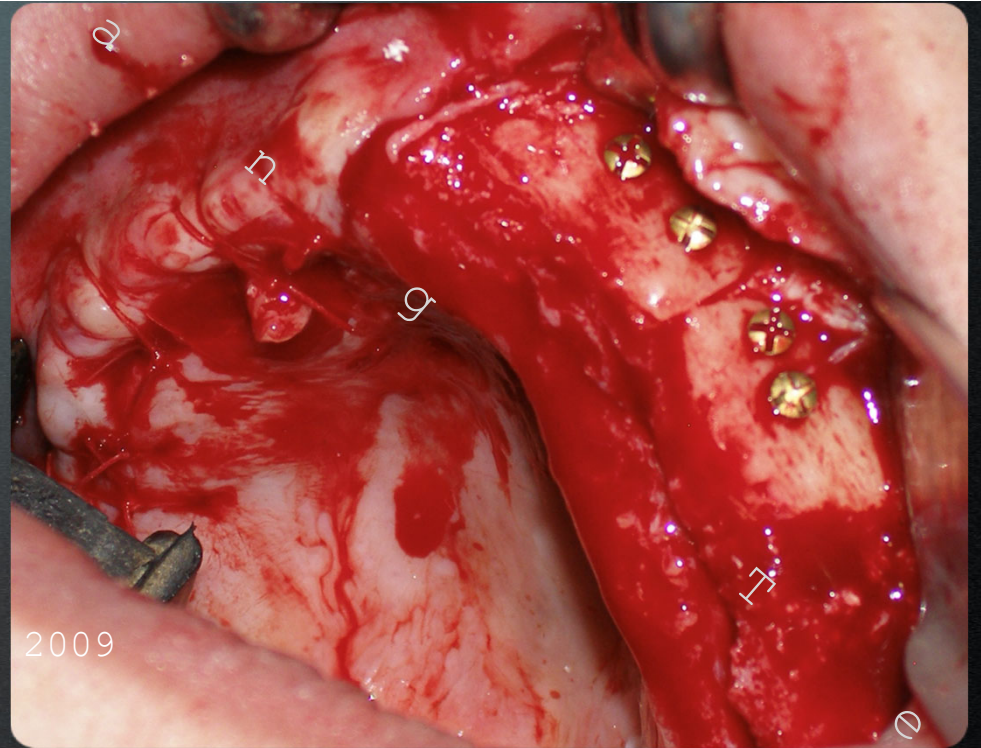
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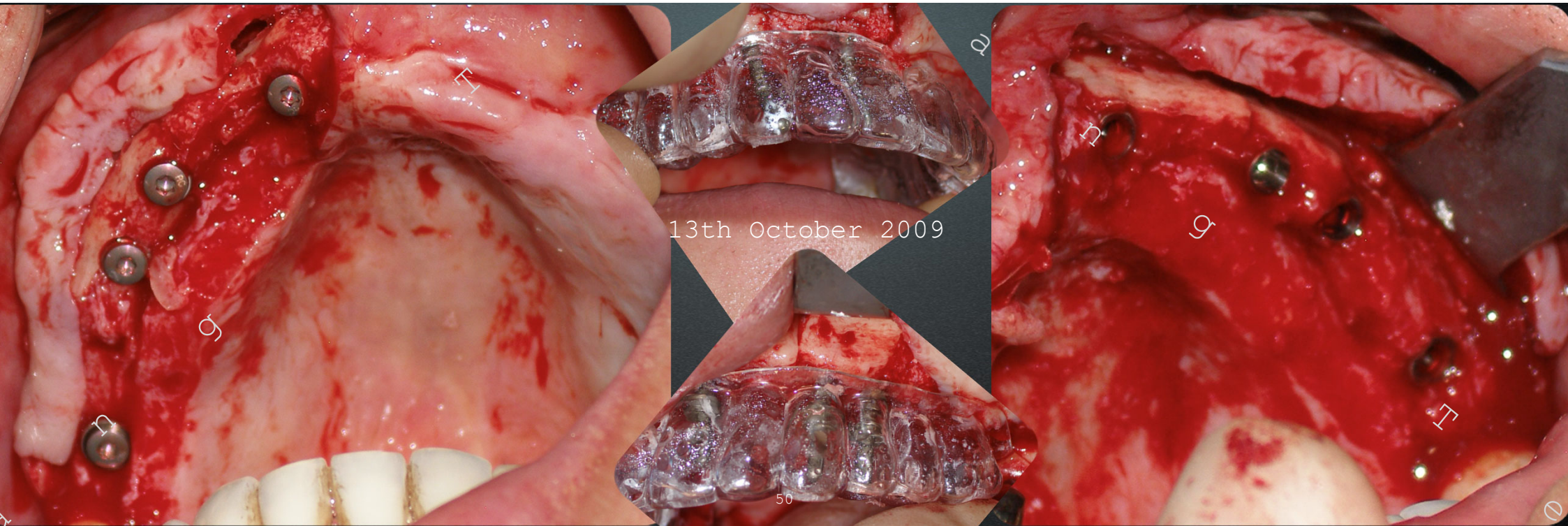
2nd June 2009

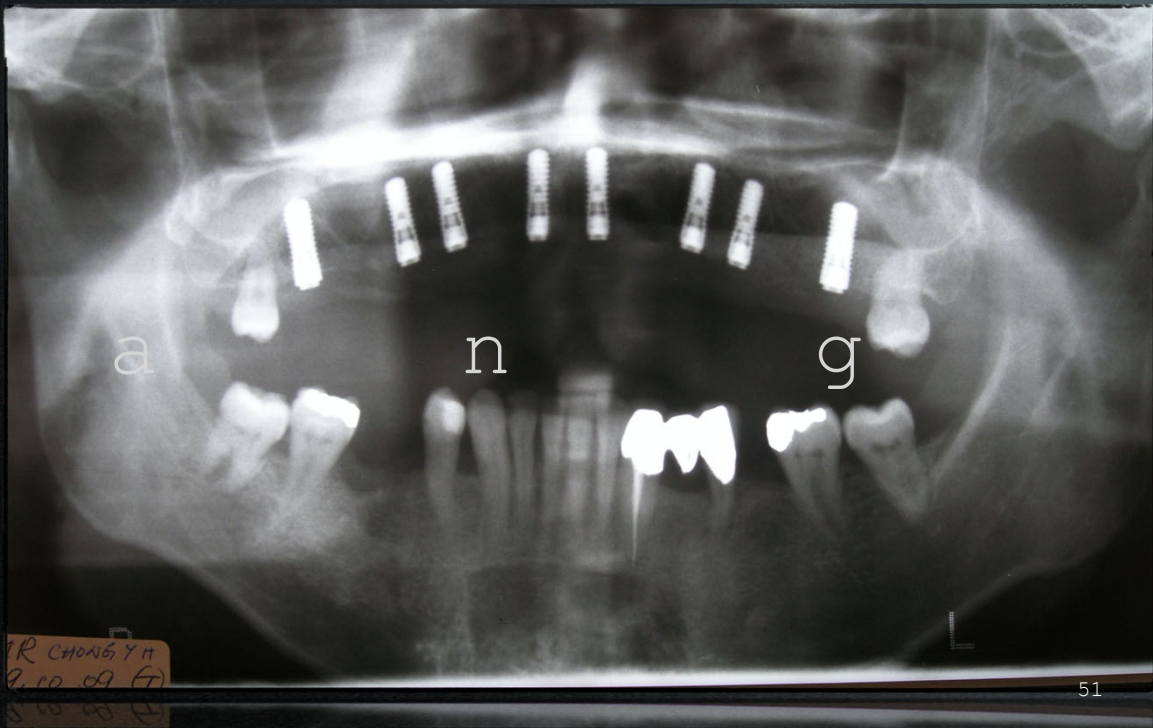
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13th October 2009







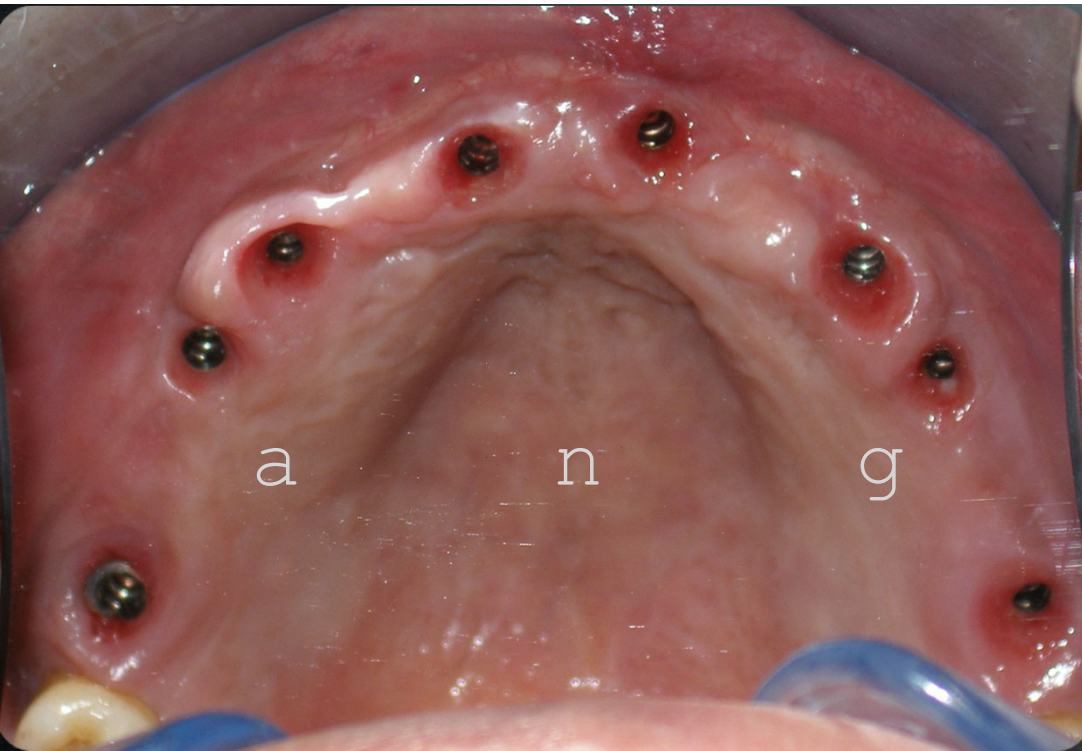
Interesting Comparison (Split mouth Design)

Right Maxillary Augmentation

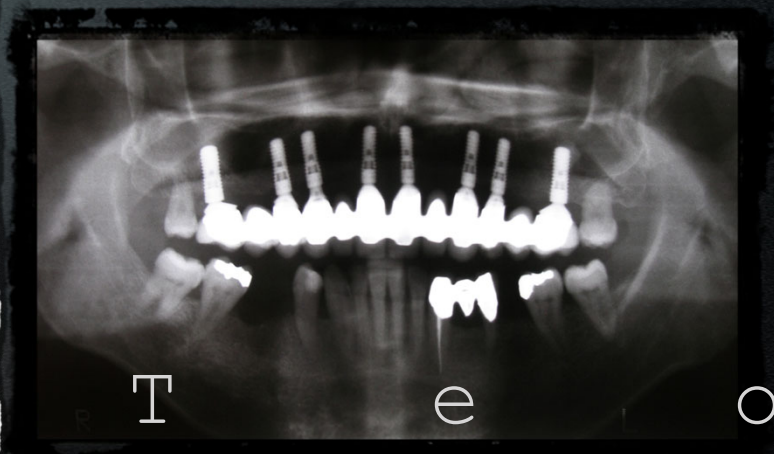
- Ramus block graft (Cortical)
- Bio-Oss particles to fill the gap
- Bio-Gide membrane
- Perforation of recipient site
- No complications
- No resorption of the graft
- 7 months healing

Left Maxillary Augmentation

- Symphyseal block graft (Corticocancellous)
- Bone chips to fill the gap
- No Biomaterial/Membrane.
- No perforation of recipient site
- No complications
- No resorption of the graft
- 4 months healing

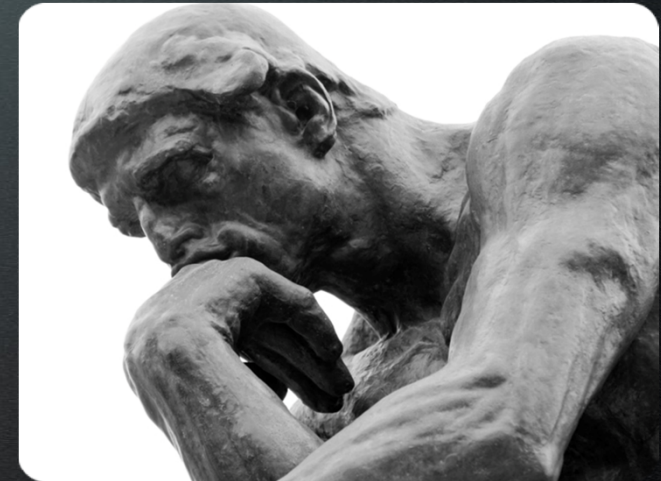


27th July 2010



Lesions learned

- Incision line and how to raise a flap is important
- Atrophic maxilla with knife edge may have very fibrous soft tissue adhesion and making flap reflection difficult.
- Distal releasing incision with crestal incision, then retract the flap
- Buccal approach
- Dissect the tough and almost fibrotic attachment at the ridge crest





Dehiscence: Thing pops out by surprise !!!

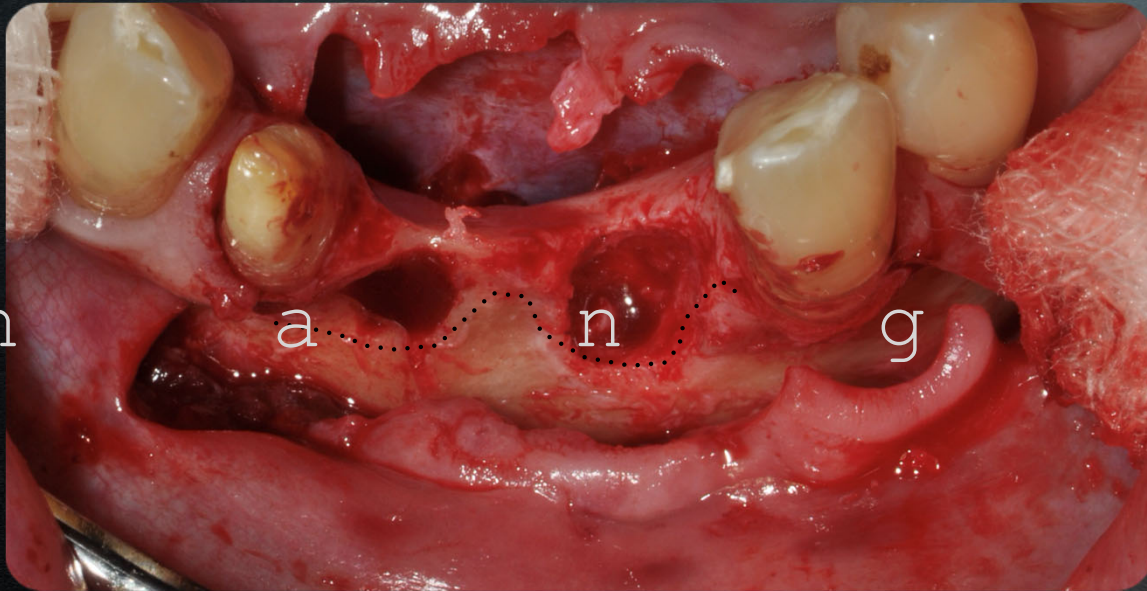
Clinical Case 4 (April 2013)

- Healthy 50 year old English gentleman: (David) Peterborough
- Main complaint: missing teeth 41, 31, 32
- Non-Smoker
- Minor vertical and horizontal bone loss
- Thin biotype
- Oral hygiene: satisfactory
- Temporization with a hybrid bridge



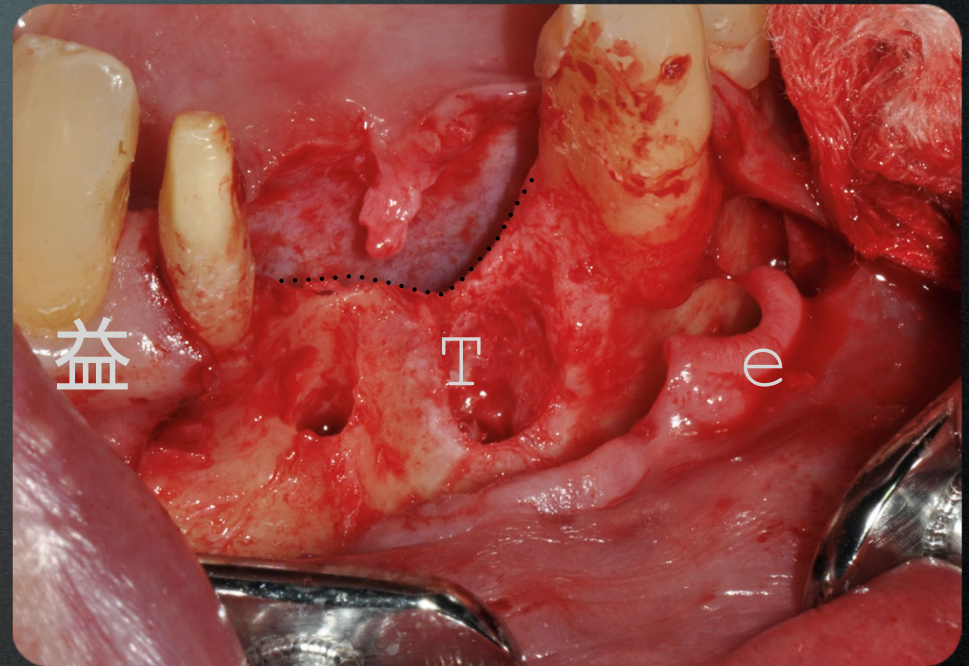
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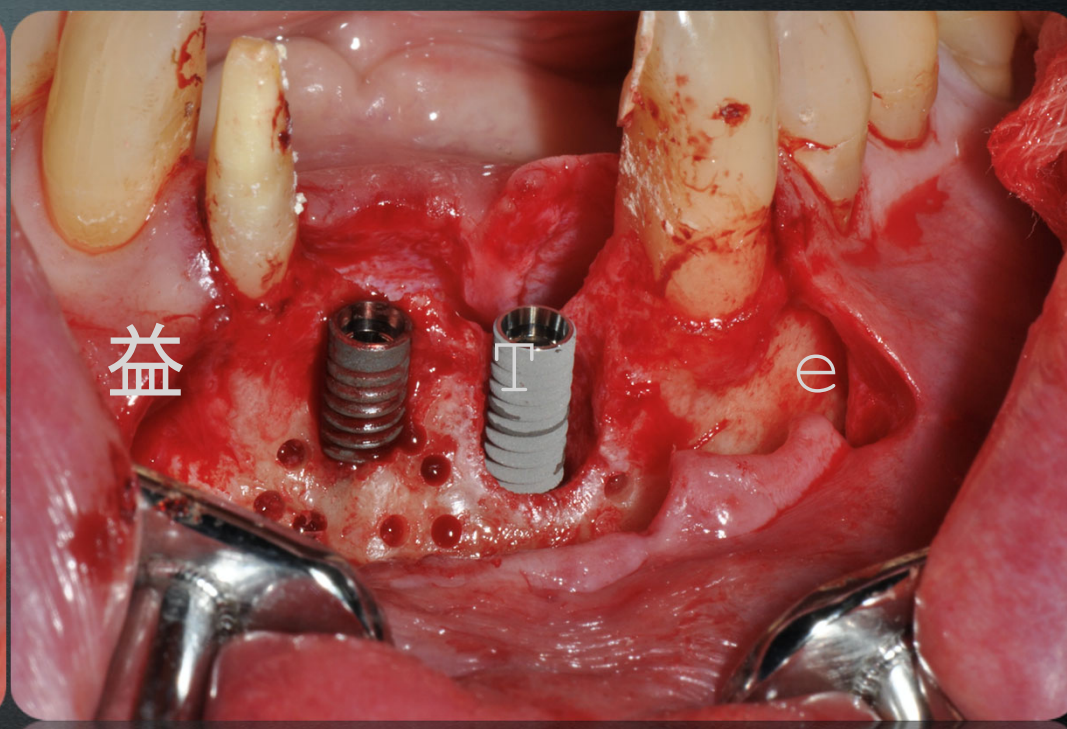
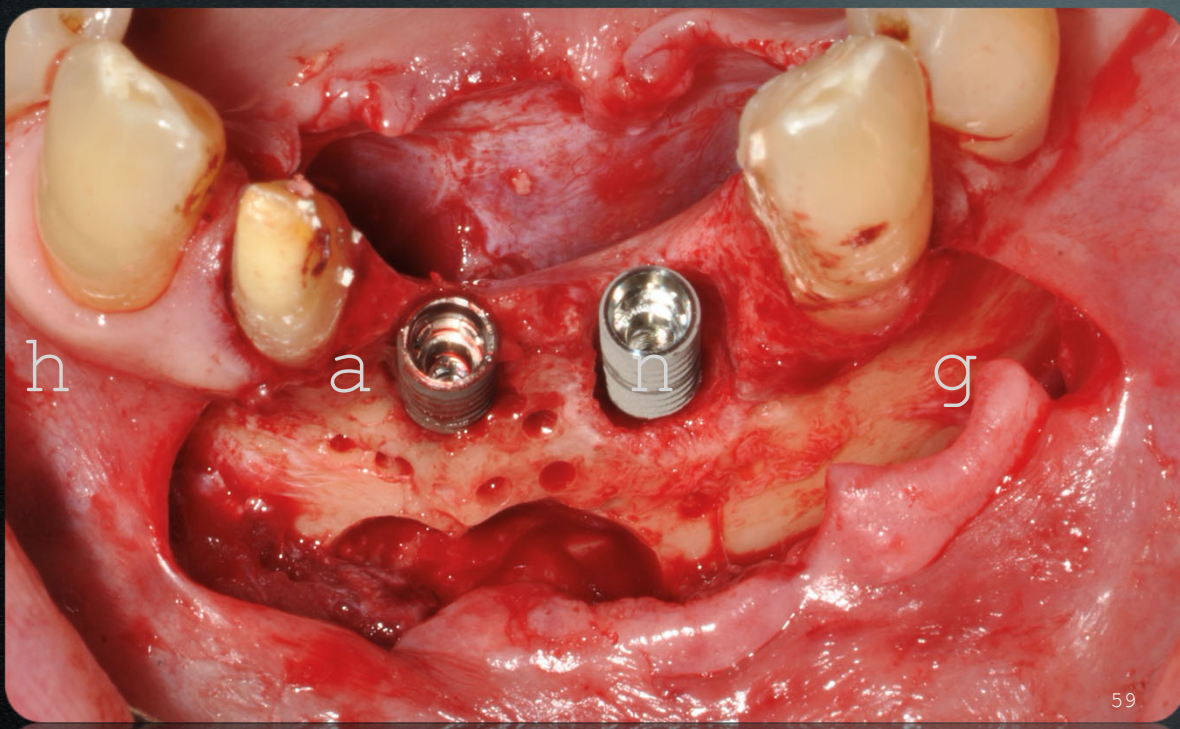
12th June 2013

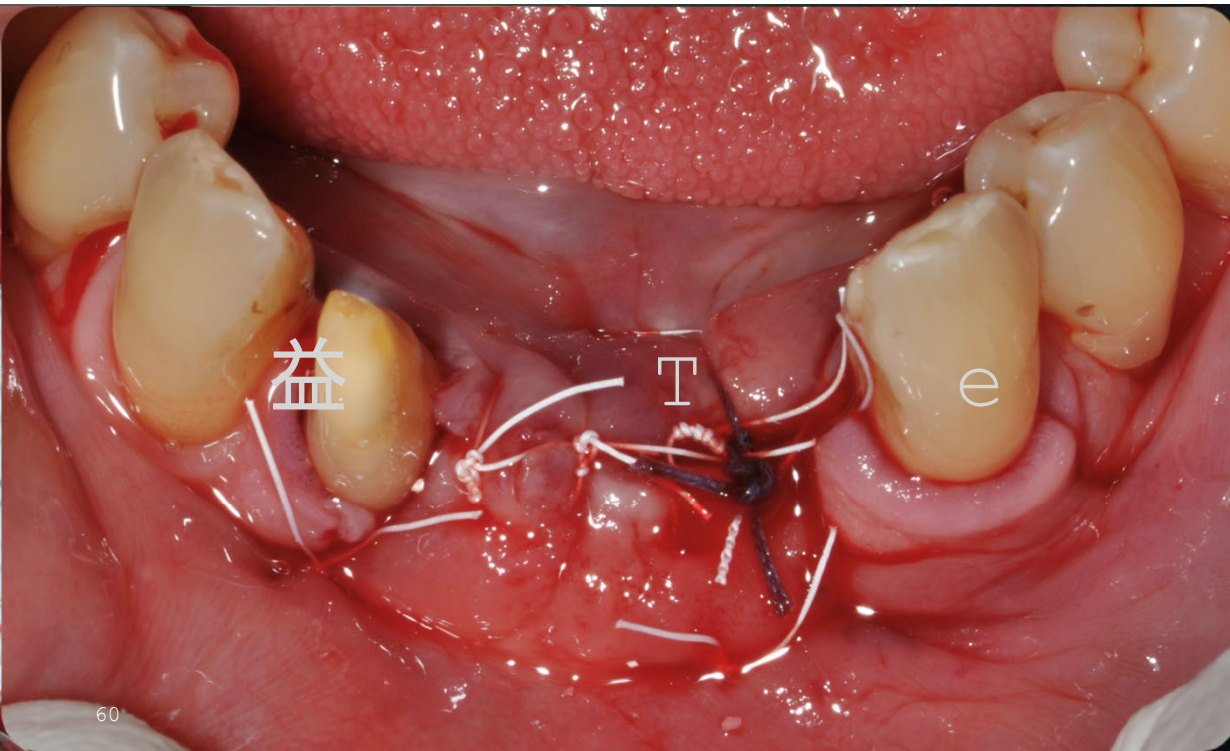
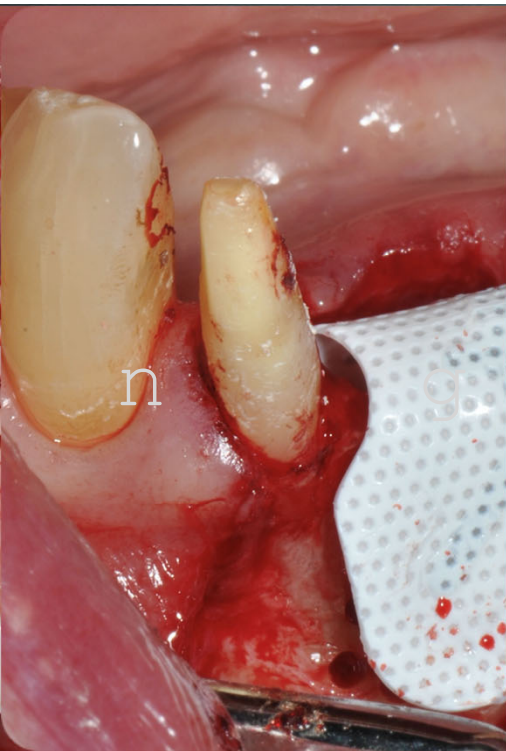
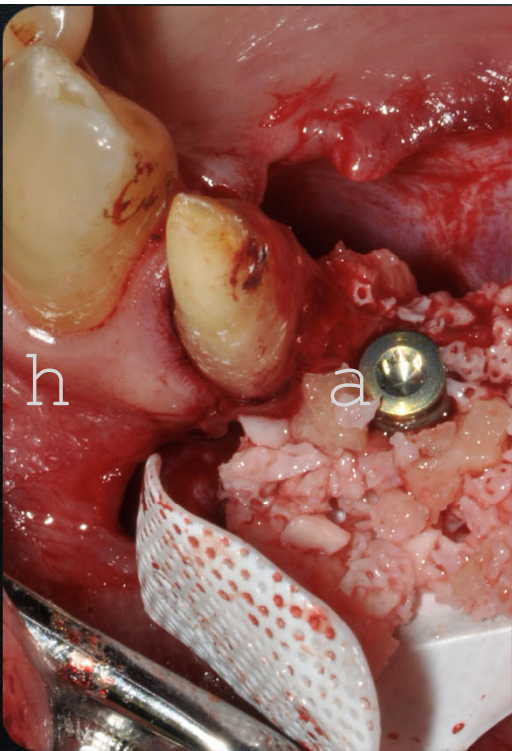


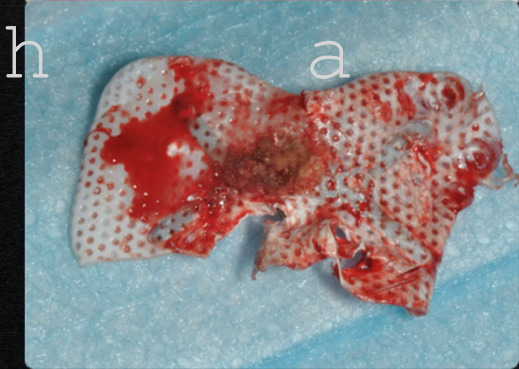
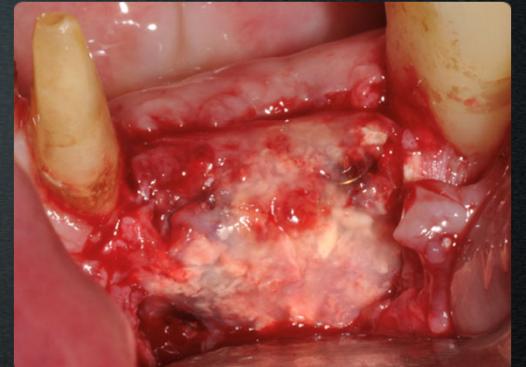
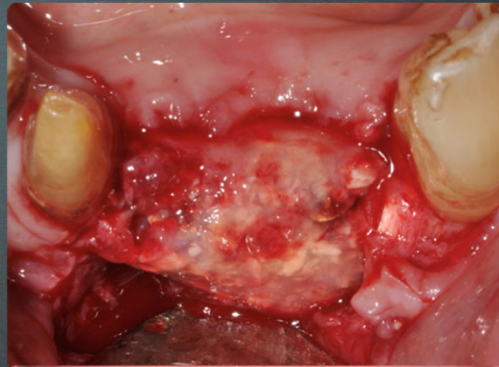
Horizontal + vertical bone loss

58









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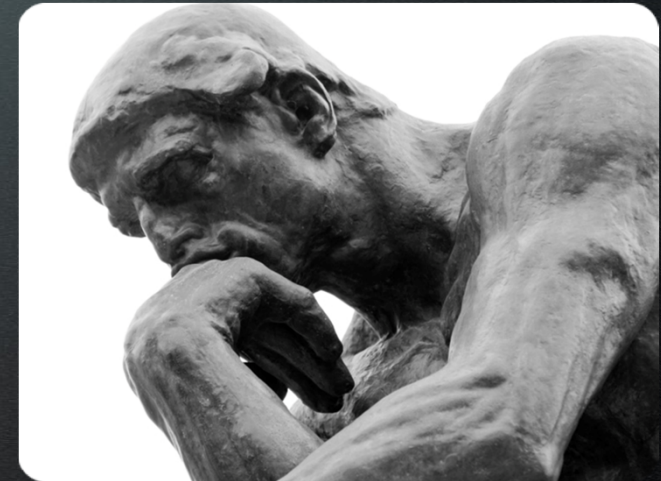
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Lesions learned

- Flap management is key: passive and tension free flap and complete coverage is essential to prevent dehiscence
- D-PTFE membrane is hydrophobic
- Resistance to flap separation from Cytoplasm membrane is minimal
- Resistance to flap separation from bone (5.08N) or dentine (1.82N) in animal studies (Werfull et.al. J Period Res. 2002: 366)



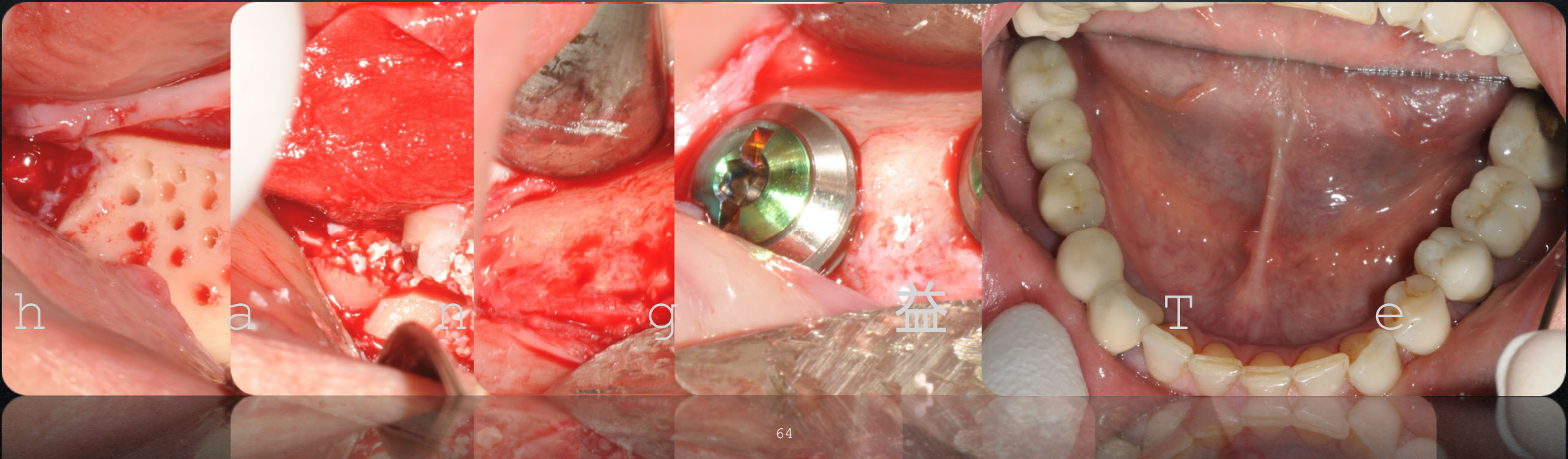
Clinical Case 5 (March 2015)

- Healthy 42 year old Eastern European lady: (Eliza) Peterborough
- Main complaint: missing teeth 12, 13, 14
- Smoker
- Vertical bone loss
- Low lip line
- Oral hygiene: satisfactory
- Successful bone graft and implant treatment in Q4



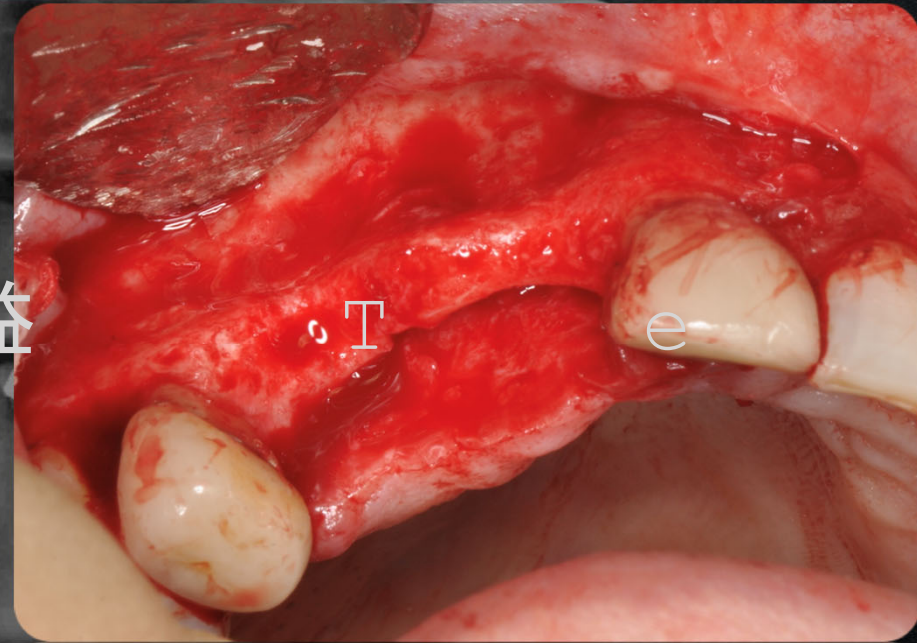
C h a n g e

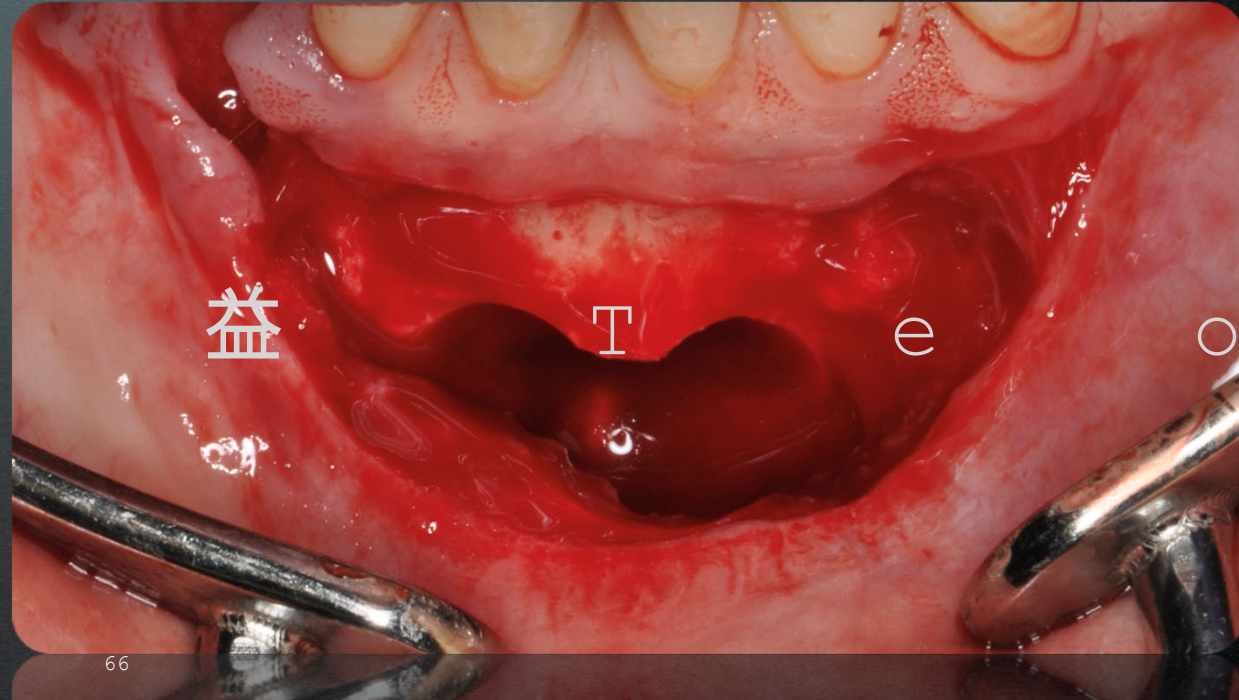
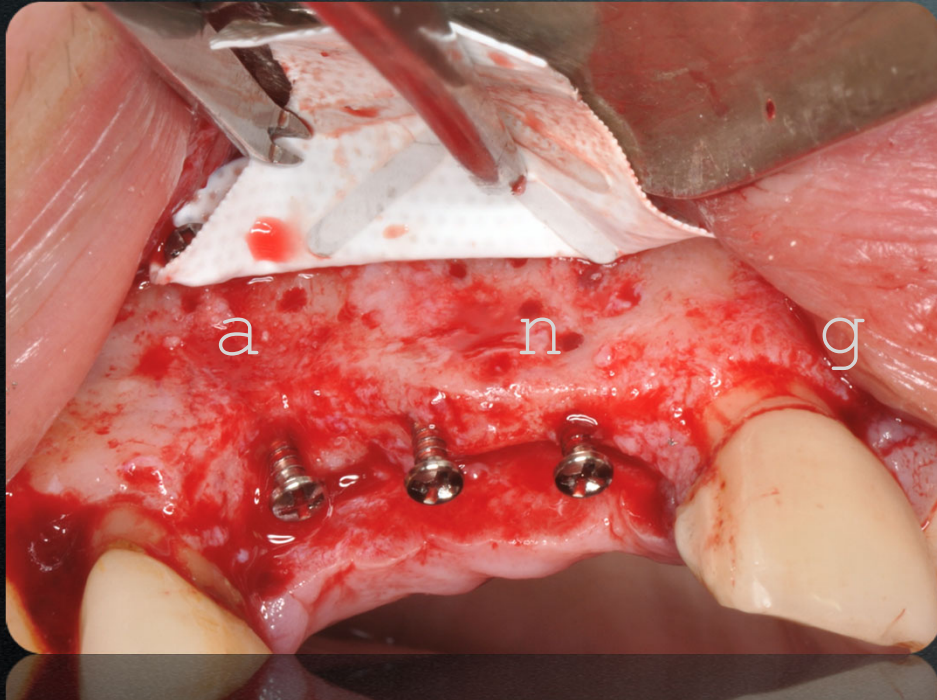
March 2013- February 2014

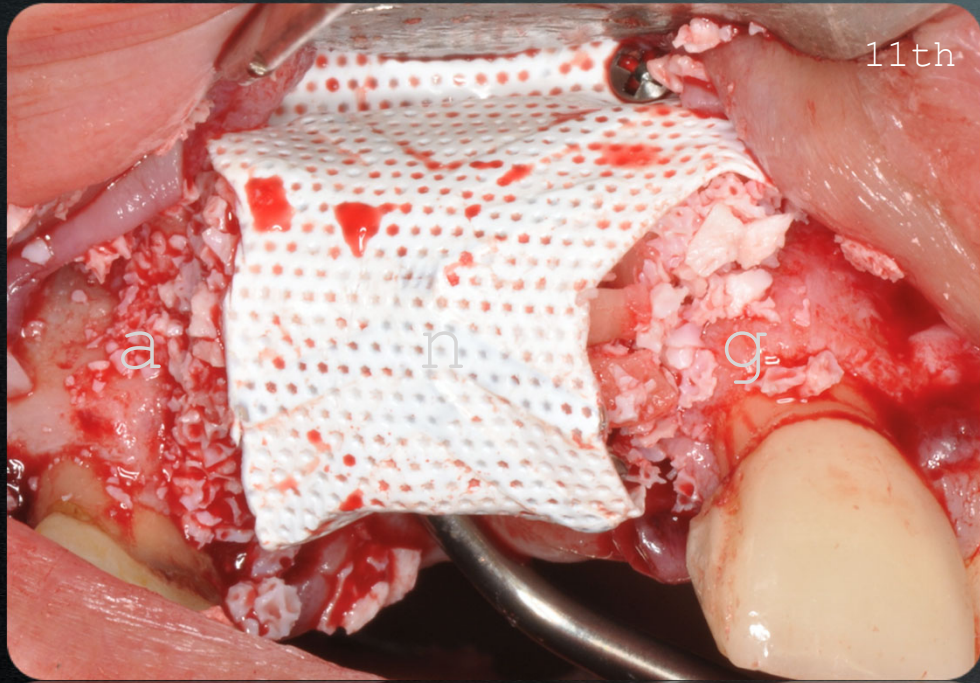


11th March 2015

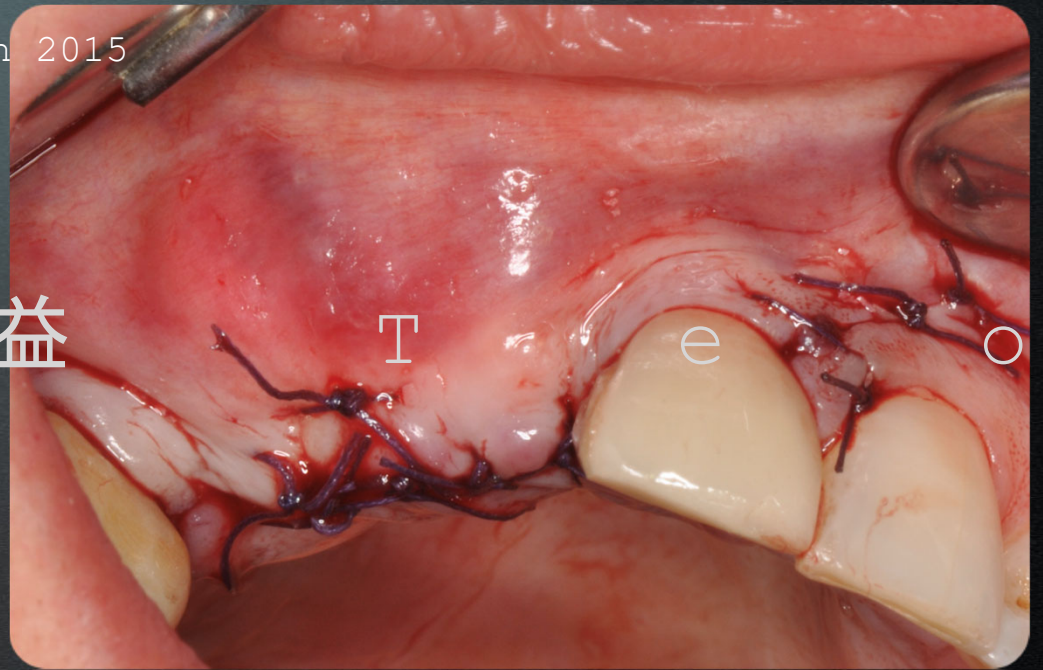
Vertical Ridge Augmentation



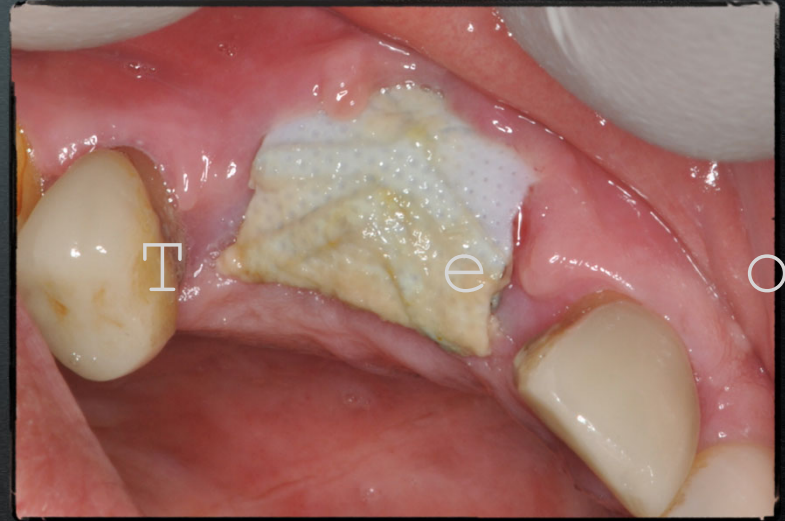
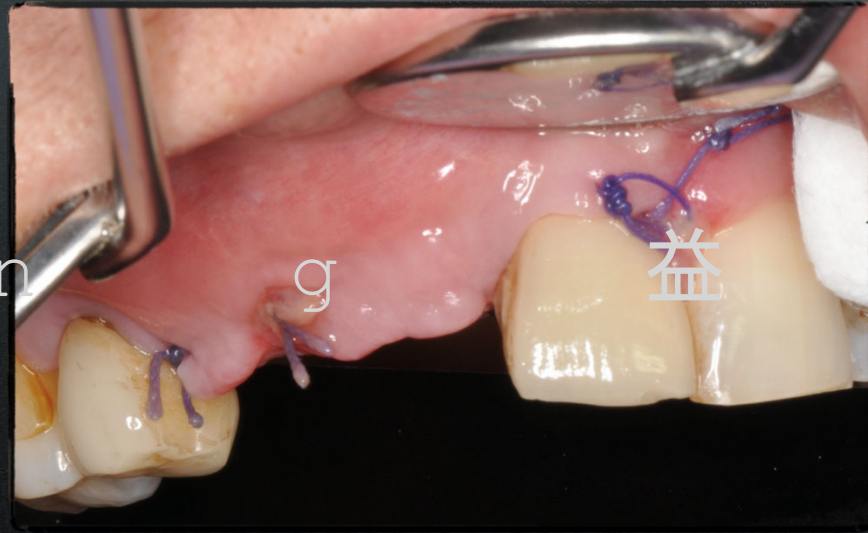
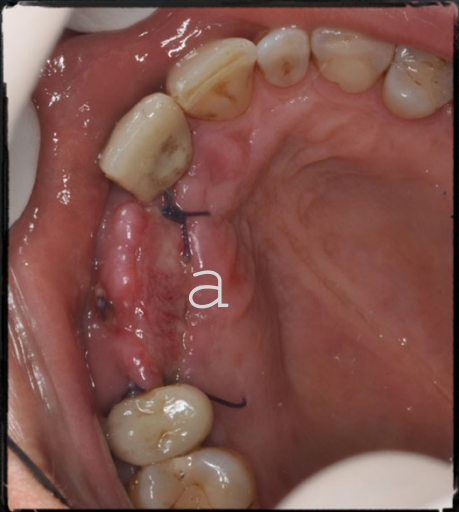




11th March 2015



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Clinical Classification of Complications in Guided Bone Regeneration Procedures by Means of Non-resorbable Membrane

Fontana F, Maschera E, Rocchietta I, Simion M
Int J Periodontics Restorative Dent 2011

HEALING

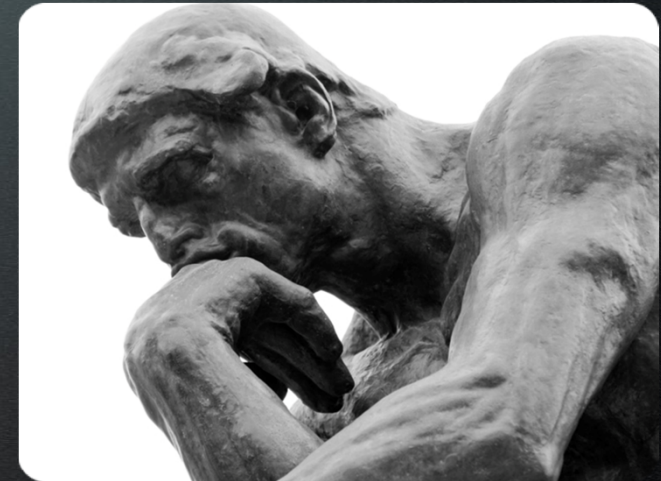
- Class I : small membrane exposure < 3mm no exudate
- Class II: large membrane exposure > 3mm no exudate
- Class III: Membrane exposure with exudate
- Class IV: abscess without membrane exposure

SURGICAL

- A: flap damage
- B: neurological complications
- C: vascular complications

Lesions learned

- Smoker
- PTFE membrane -High risk
- Horizontal ridge augmentation and pink porcelain could be an alternative option in smoker patients
- FLAP Management in wound closure is Pivotal to successful outcome.

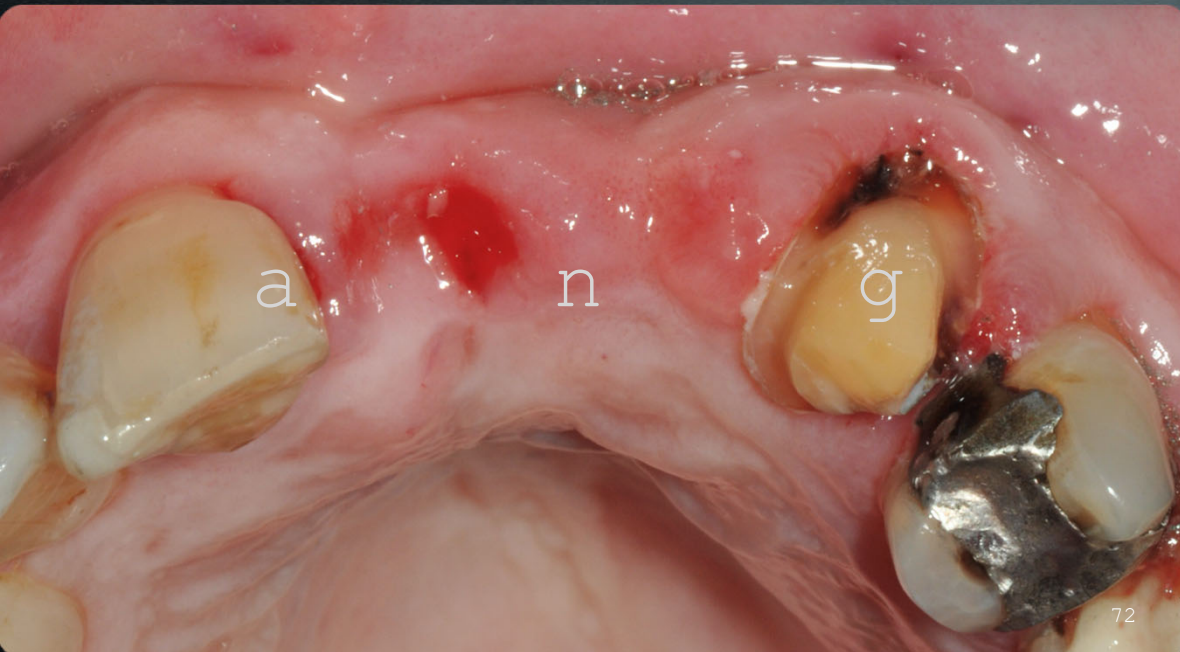


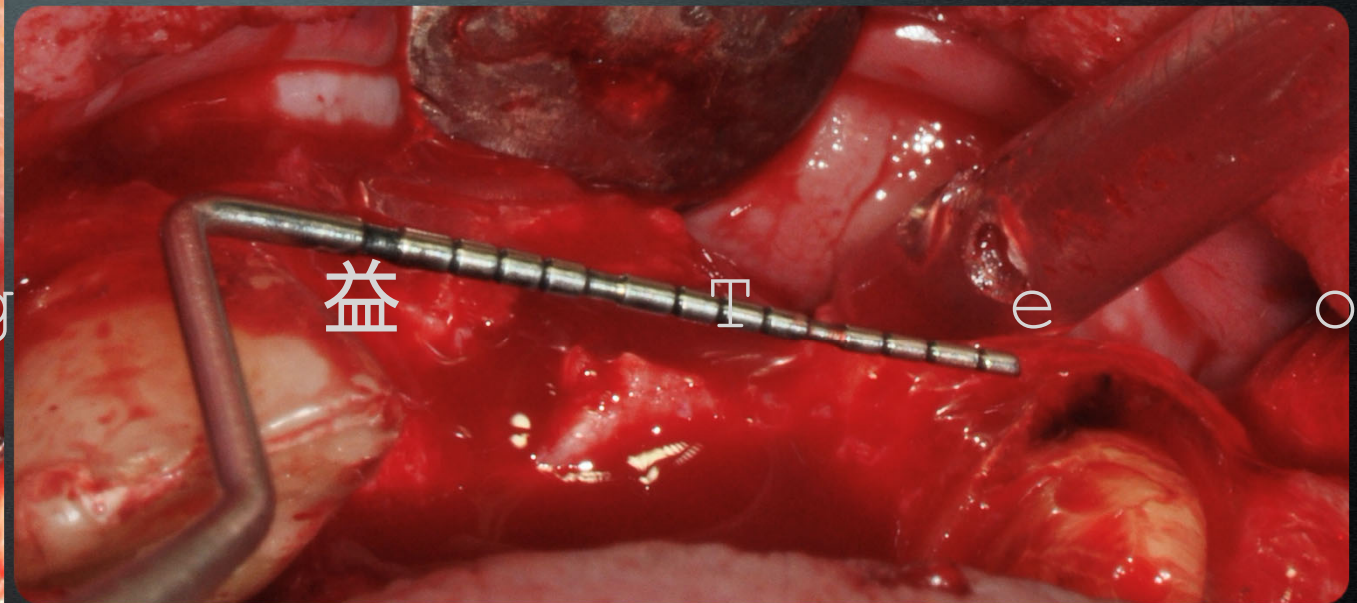
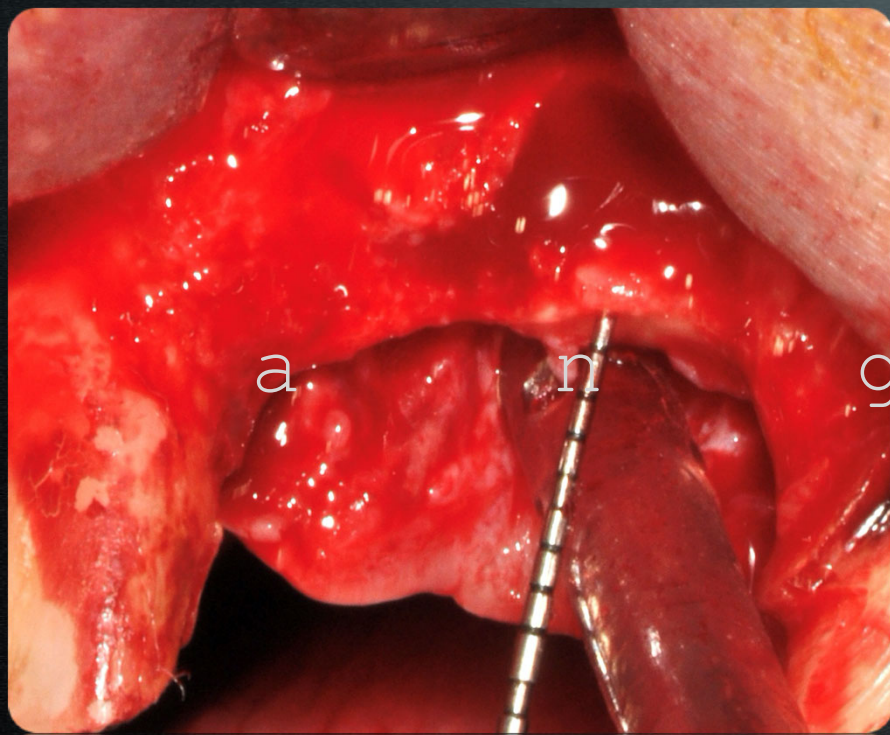
Clinical Case 6 (March 2015)

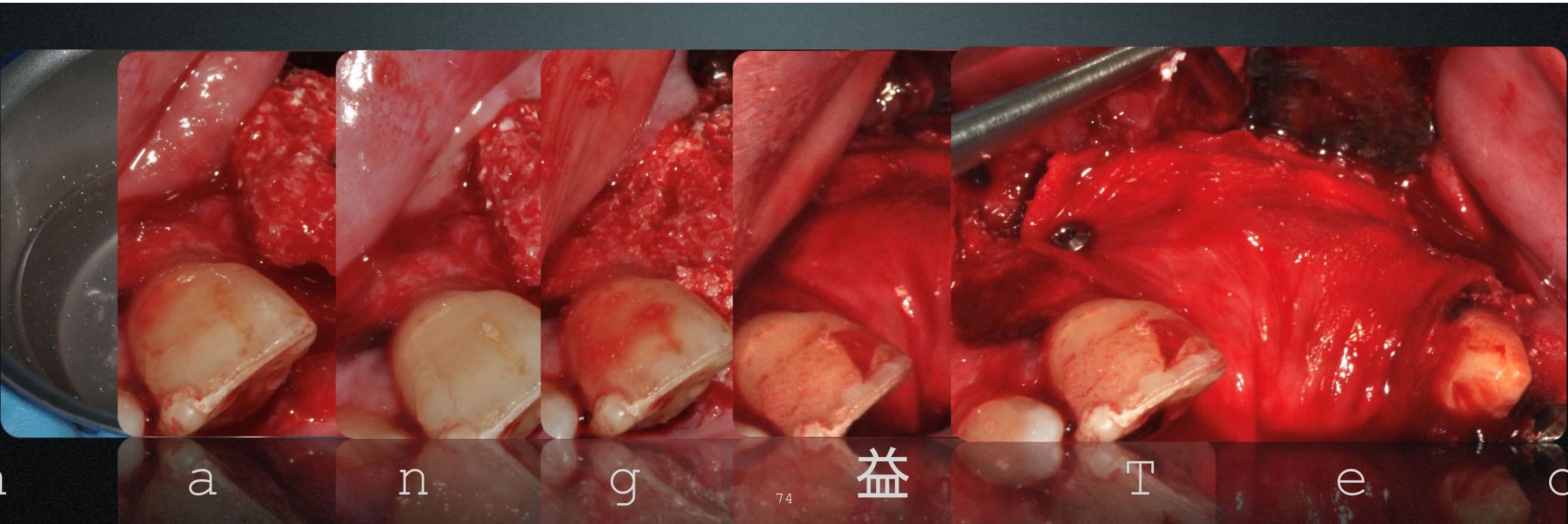
- Healthy 58 year old English gentleman (Ralph)
- Main complaint: missing teeth 21 & 22
- Smoker
- Vertical and horizontal bone loss
- Low lip line
- Oral hygiene: satisfactory
- Would like to avoid autogenous bone graft



Vertical and Horizontal ridge defect







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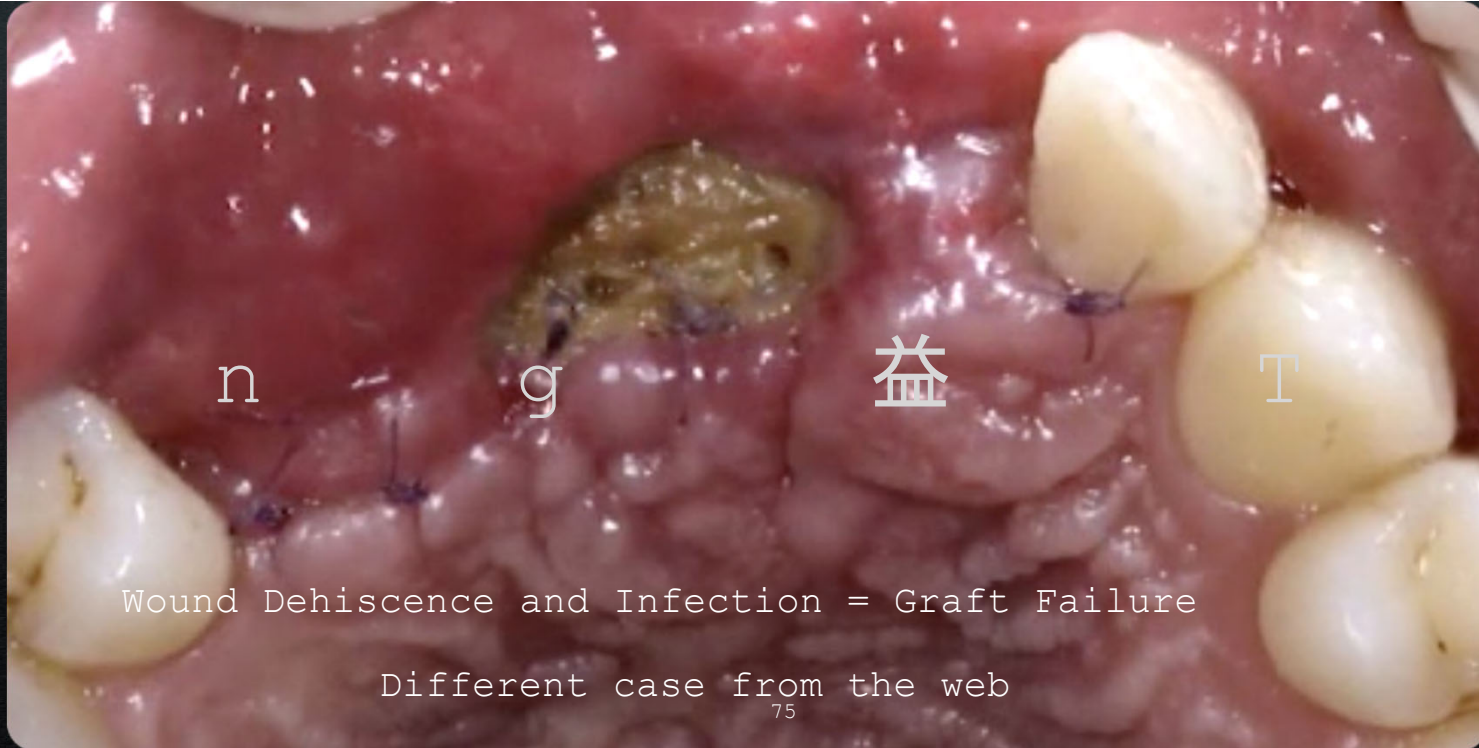
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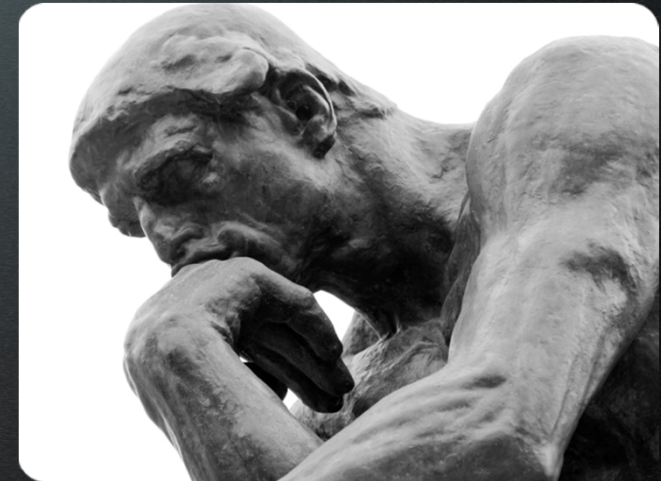
o

Wound Dehiscence and Infection = Graft Failure

Different case from the web

Lesions learned

- Foreign material & wound dehiscence = bad news
- Collagen membrane does not offer too much protection
- FLAP Management in wound closure is “Pivotal” in achieving a successful outcome.

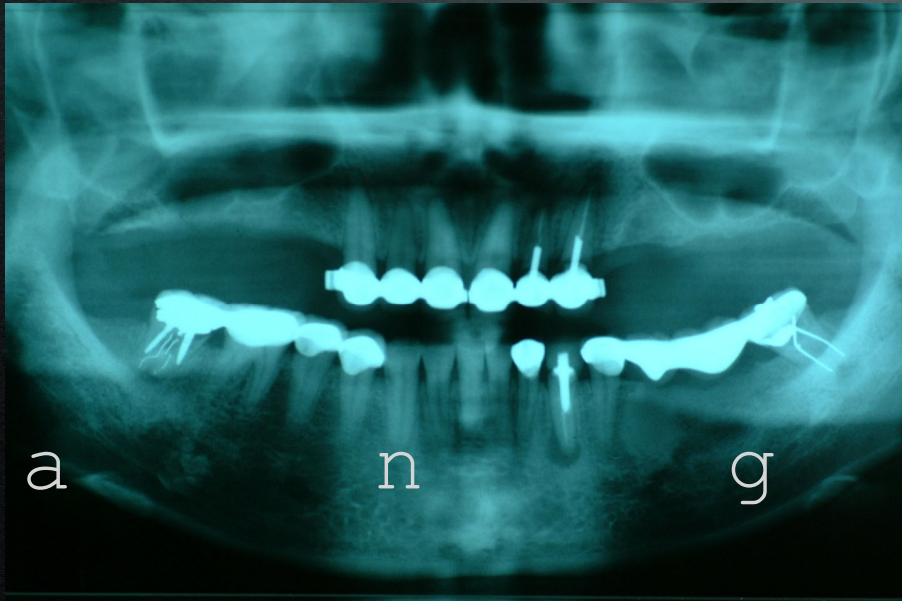


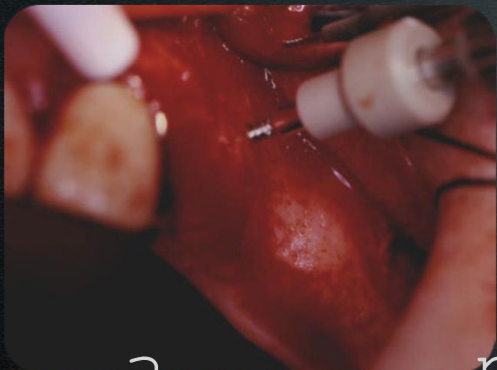
Clinical Case 7 (March 2000)

- Healthy 44year old HK Chinese lady: (Ada)
- Main complaint: missing upper back teeth & loose anterior crowns
- Non Smoker
- Oral hygiene: satisfactory
- Failing upper dentition
- Insufficient bone volume for implant placement
- Required sinus augmentation and horizontal ridge augmentation

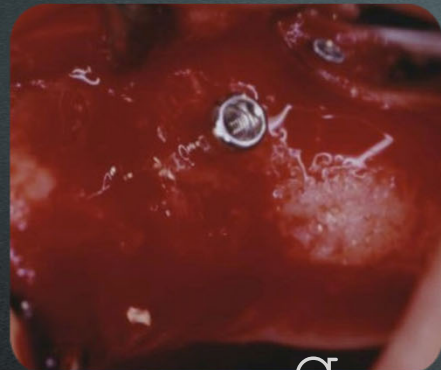


C h a n g T e

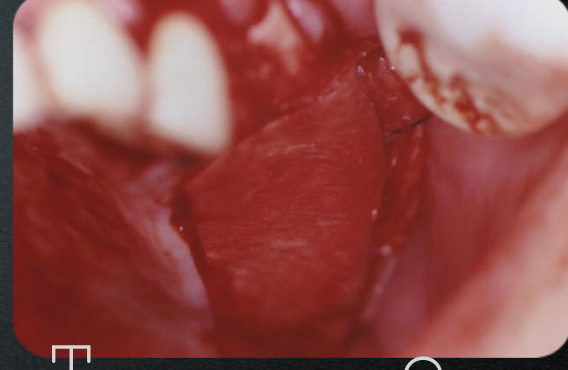
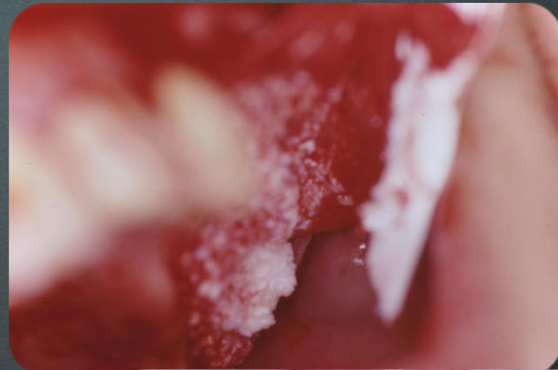




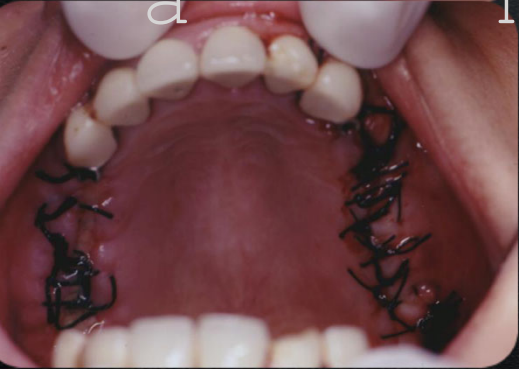
a



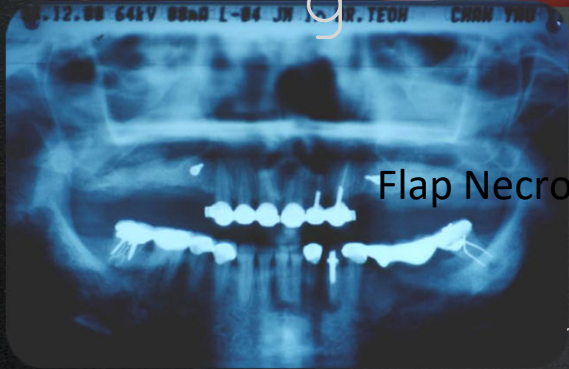
b



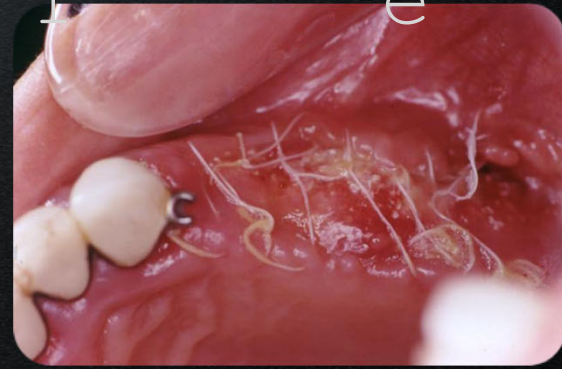
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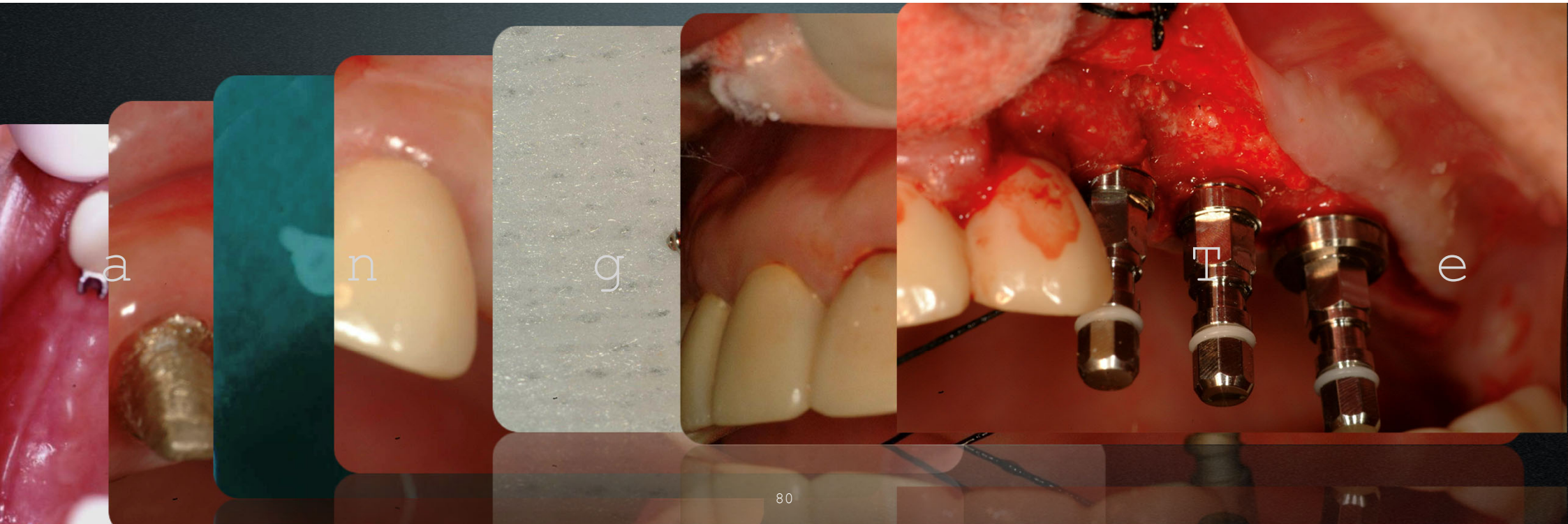
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Flap Necrosis

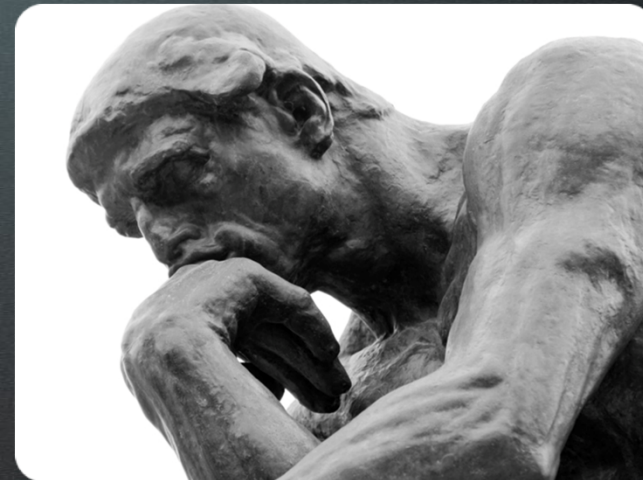


h



Lesions learned

- Overtightening of the flap may result of strangulation.
- Flap tension < 5 gm: free of complication; > 5 gm 10% chance: and > 10gm 40 -100% chance of wound dehiscence.
- One single periosteal releasing incision is preferred .
- Internal holding sutures (87% reduction of tension).
- Staged approach gives you a better chance of graft survival compare to simultaneous approach.





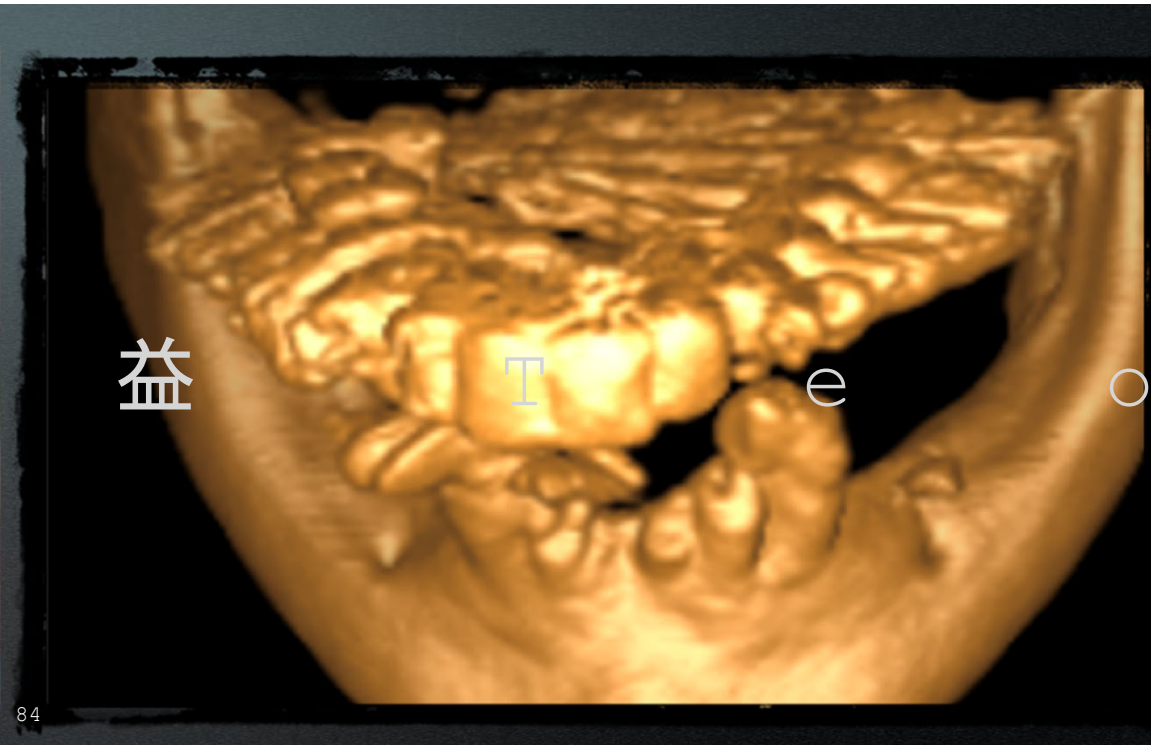
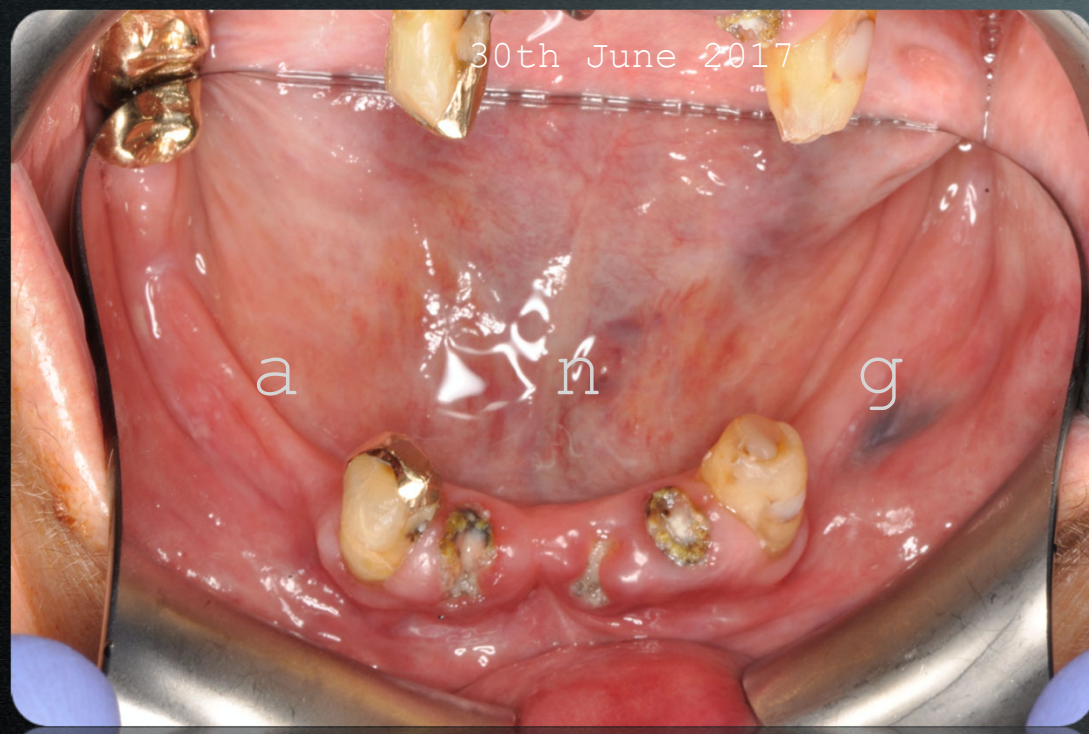
3-Legged Table !!!!!

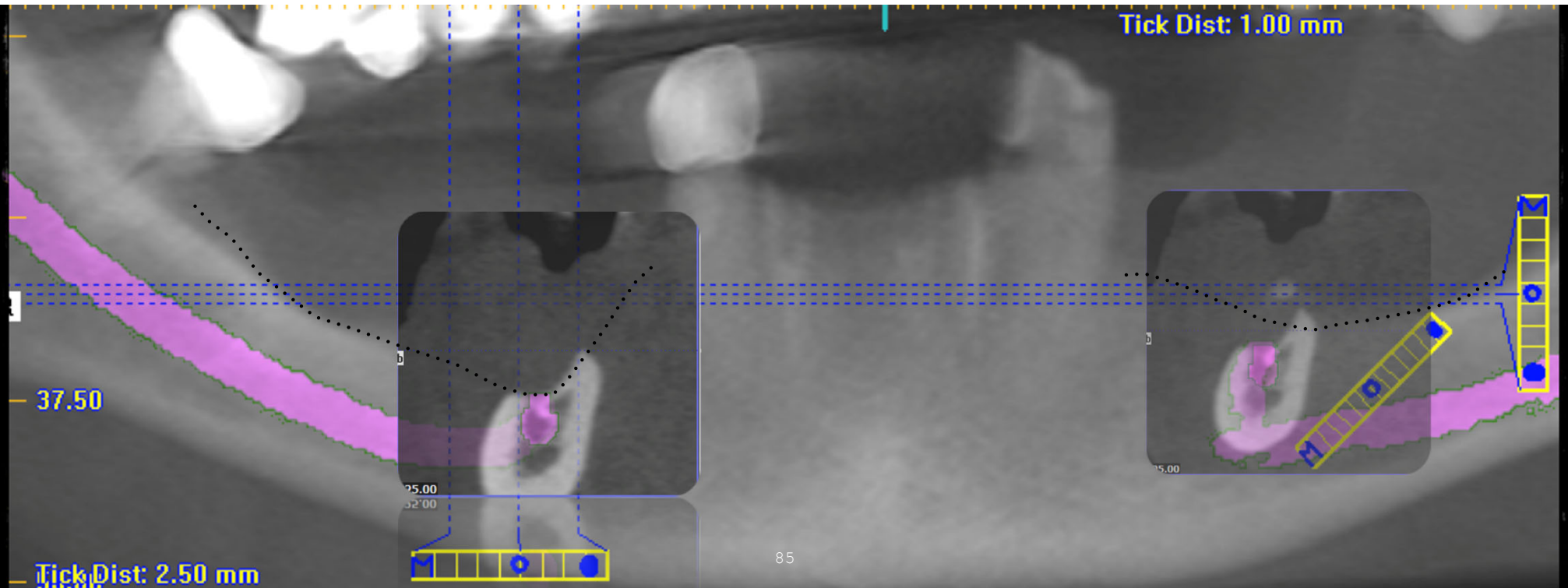
Clinical Case 8 (30th June 2017)

- Healthy 78 year old Caucasian lady (Enid)
- Main complaint: failing lower dentition
- Pt would like to have fixed restoration
- Non Smoker
- Class I incisal relationship
- Very atrophic posterior mandible



C h a n g e



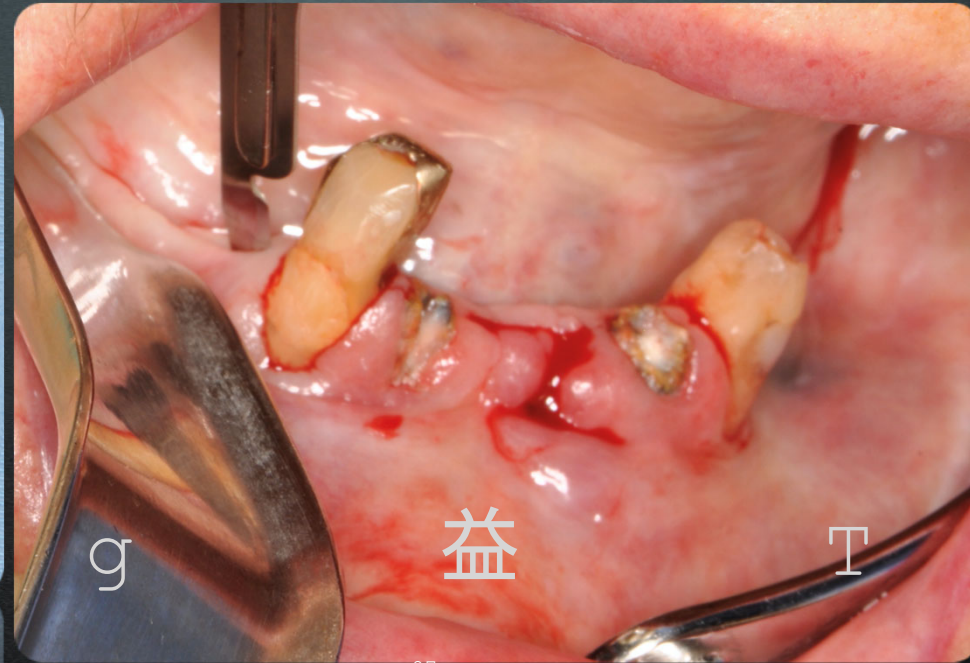


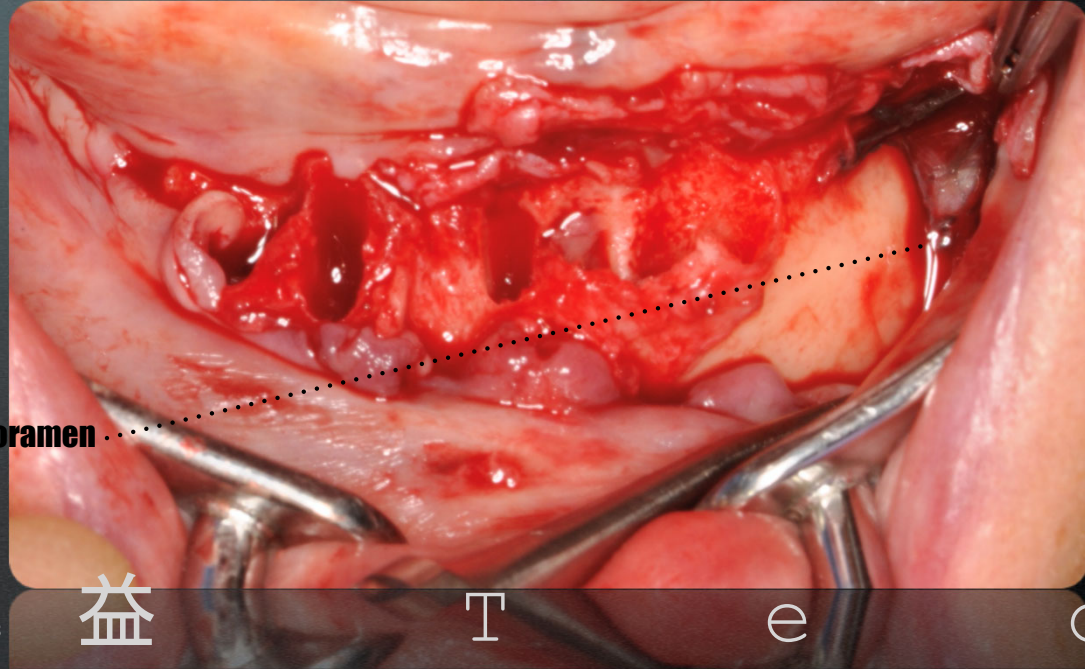
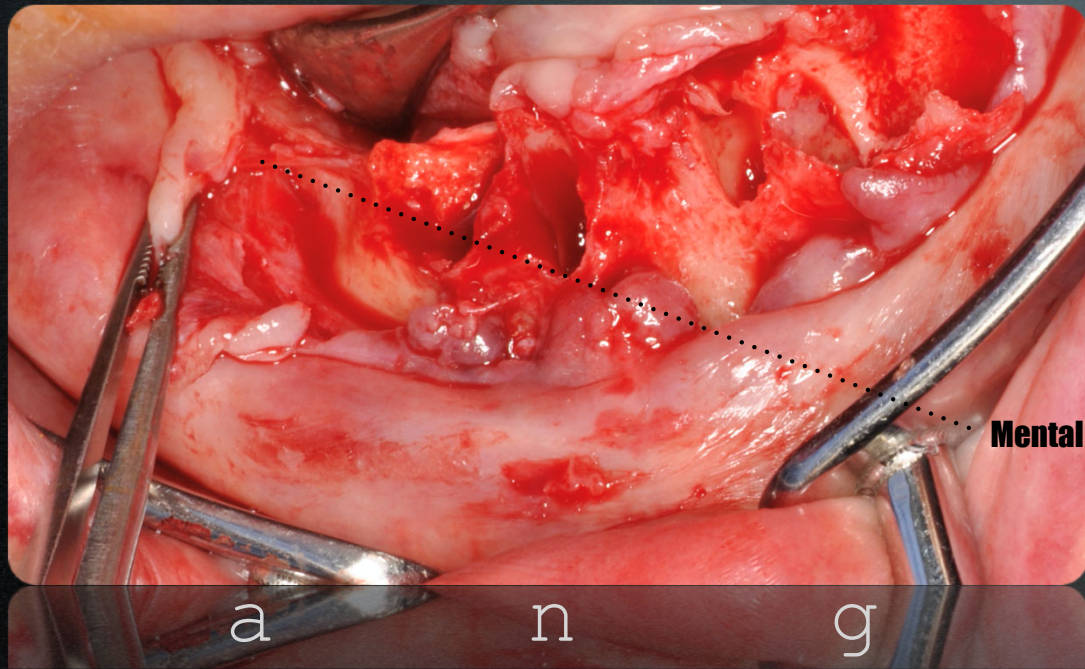
Treatment Plan

- Pro-Arch (All-on-4) immediate loading protocol



30th June 2017





Mental foramen

Ridge flattening or Bone reduction

