

PERI-IMPLANTITIS

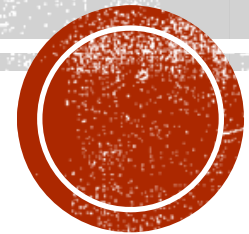
EVIDENCE BASED DENTISTRY ROUNDS - PERIODONTICS

Group 10 B2

D1 – Kelly Herzog. D2 – Schuchi Patel,

D3 – Jisoo Hong, D4 – Maggie Meyer

October 21, 2020



ROUNDS TEAM



- Group Leader : Dr.Yray
- Specialty Leader : Dr. Guentsch
- D4 – Maggie Meyer
- D3 – Jisoo Hong
- D2 – Schuchi Patel
- D1 – Kelly Herzog



PATIENT INFORMATION

- 73 year old African American Female
- Presents for Transfer Exam July 21 2020
- Implant #14 placed November 2018 and restored August 2019
- Chief Complaint – “I sometimes have bleeding around my upper back implant when I brush”



MEDICAL HISTORY

- Medications
 - Lisinopril - High blood pressure
 - Zetia – Cholesterol
 - Crestor – Cholesterol
 - Baby Aspirin
 - Multi-Vitamin
- Allergy
 - Morphine – itching
- BP at transfer exam
 - 130/87

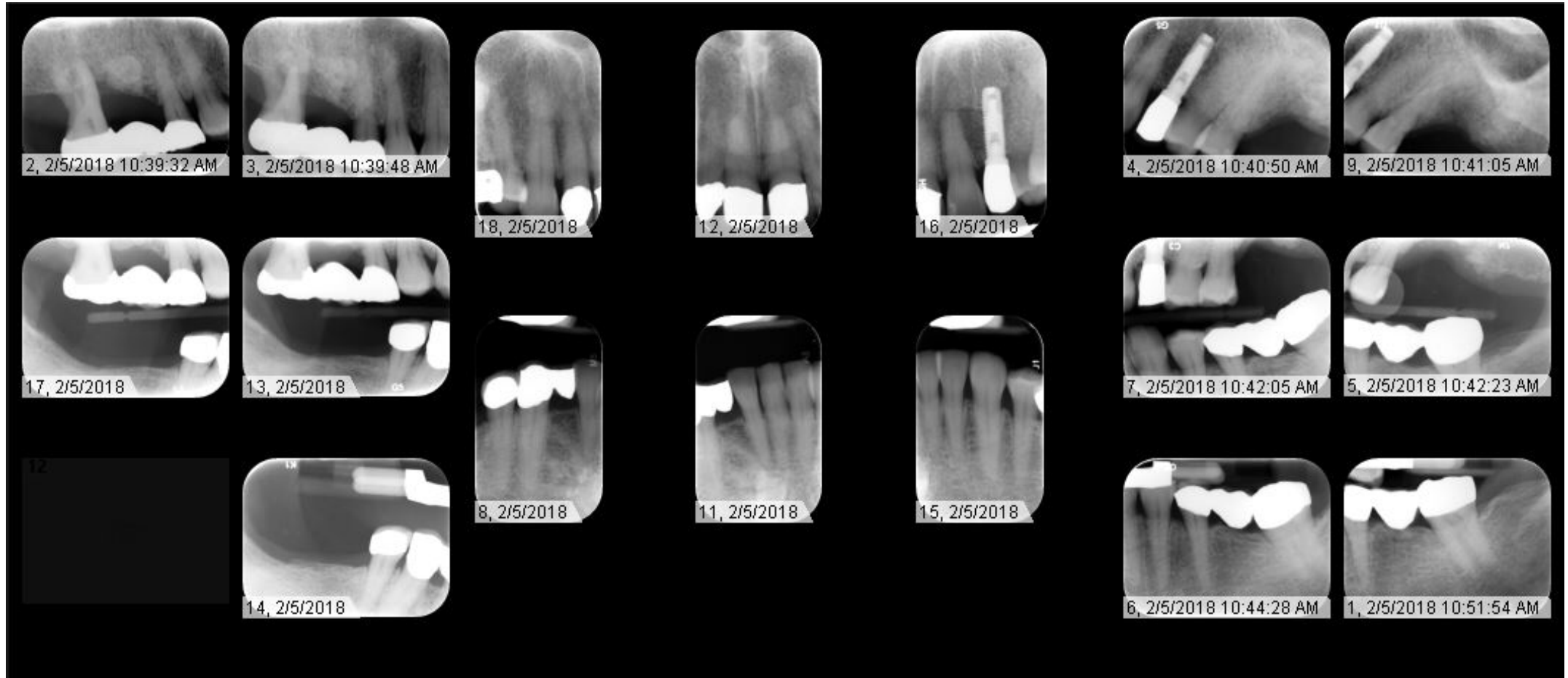


DENTAL HISTORY

- Patient comes consistently for cleanings/exams
- Past extractions
- Implants in #11, 14, and 30
- Periodontal treatments
- CORAH – 5 – feels relaxed in the dental chair



RADIOGRAPHS – FMX 2018



RADIOGRAPHIC FINDINGS

- Bone resorption around implant #14 since placement of the crown on 8/27/2019



RADIOGRAPHS



1. 11/18
Implant
Placement



2. 8/19
Implant
Restored



3. 7/20
Transfer Exam
– crater defect





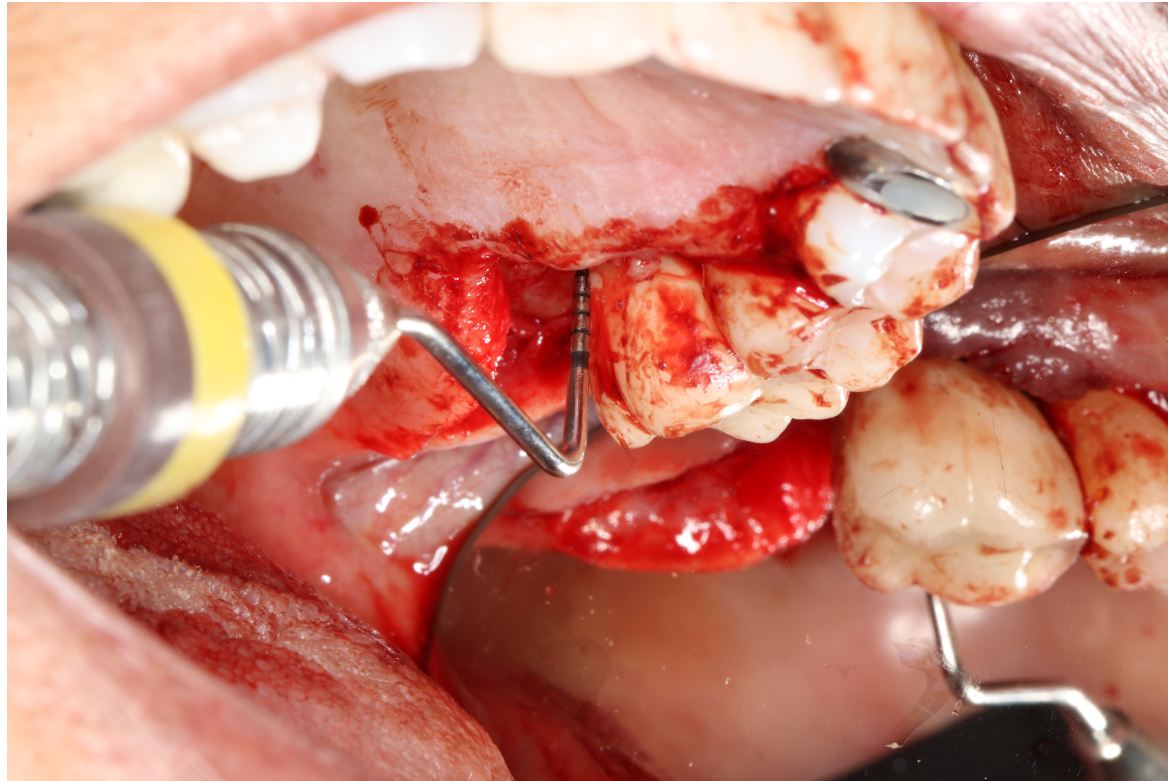
- Visible granulation tissue around implant.
- Red and edematous papillary tissue
- Recession on the palatal aspect of the implant fixture exposing threads

CLINICAL FINDINGS



PERIODONTAL FINDINGS

- 10mm pocket DL and 6mm ML
- Very sensitive to probing and BOP



PERIODONTAL DIAGNOSIS

- Peri-implantitis with a crater bone defect



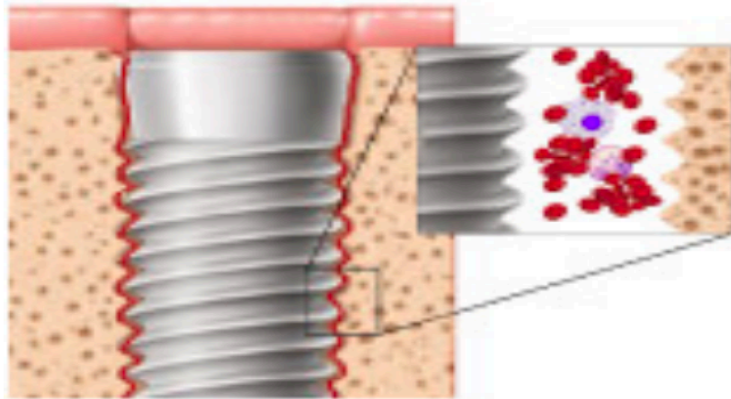
PROBLEM LIST

- Peri-implantitis #14
- Filling over implant #11 fell out
- #30 implant need to be restored with crown



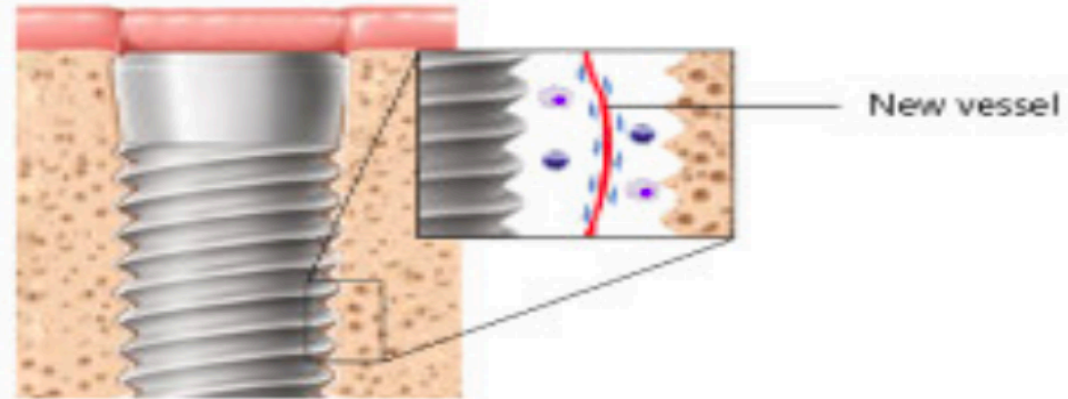
D1 BASIC SCIENCE - What is osseointegration?

Primarily mechanical stability



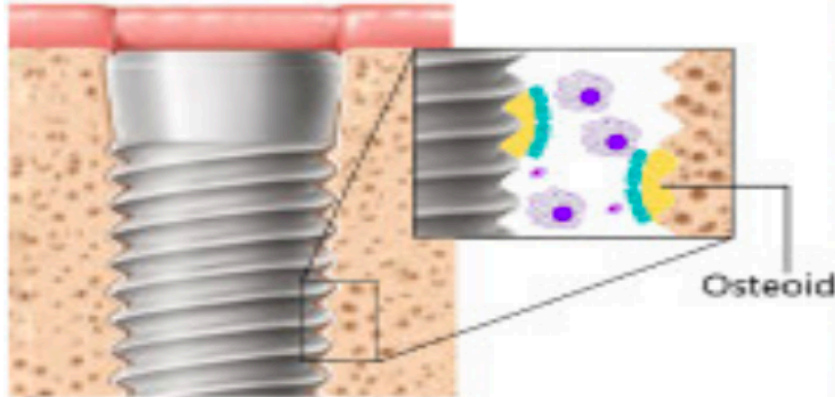
In 24 hours

New vessel formation



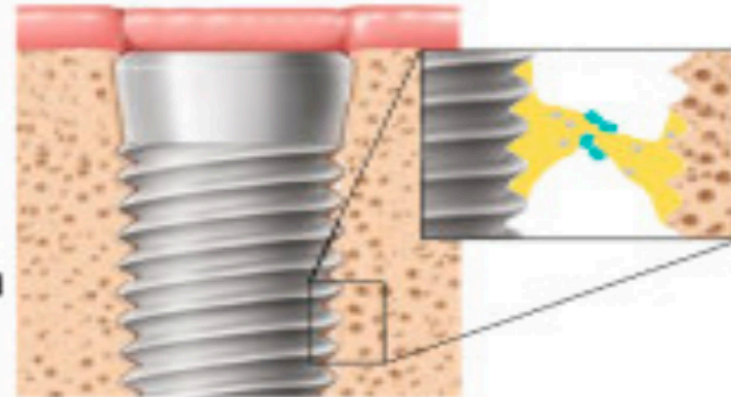
On the 4th day

Temporary loosening



On the 4th week

Secondary stability



After 6-8 weeks

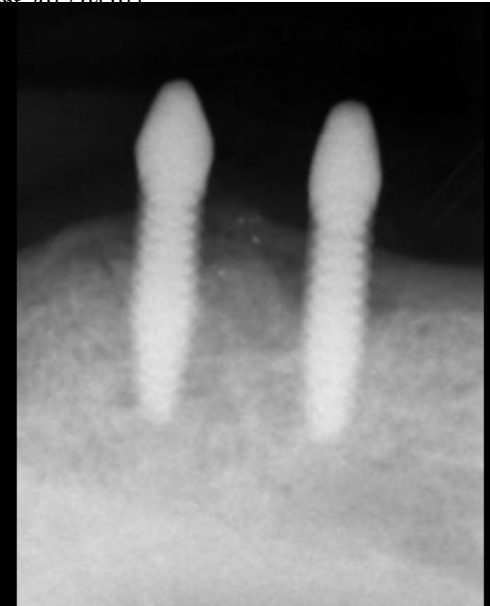
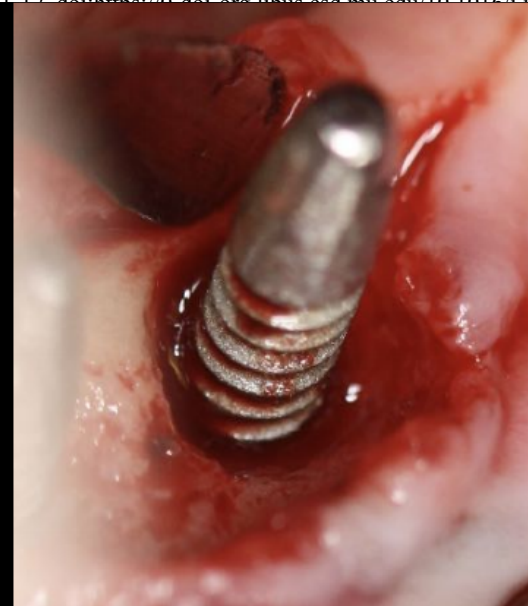
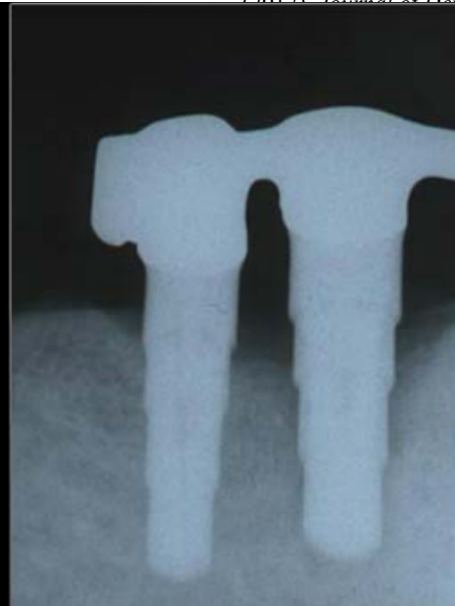
- Neutrophil
- Macrophage
- Erythrocyte
- Monocyte
- Mesenchymal stem cell
- Osteoblast
- T cell
- Osteocyte

D2 PATHOLOGY - WHAT IS PERI- IMPLANTITIS AND WHAT LEADS TO ITS ONSET?

- Inflammatory reaction from loss of supporting bone around implant¹
 - Inflammation, BOP, increased pocket depths, progressive bone loss, 2-3 mm bone loss radiographically, >6mm probing depths¹
- Smoking, diabetes mellitus, lack of prophylaxis, history of periodontitis²

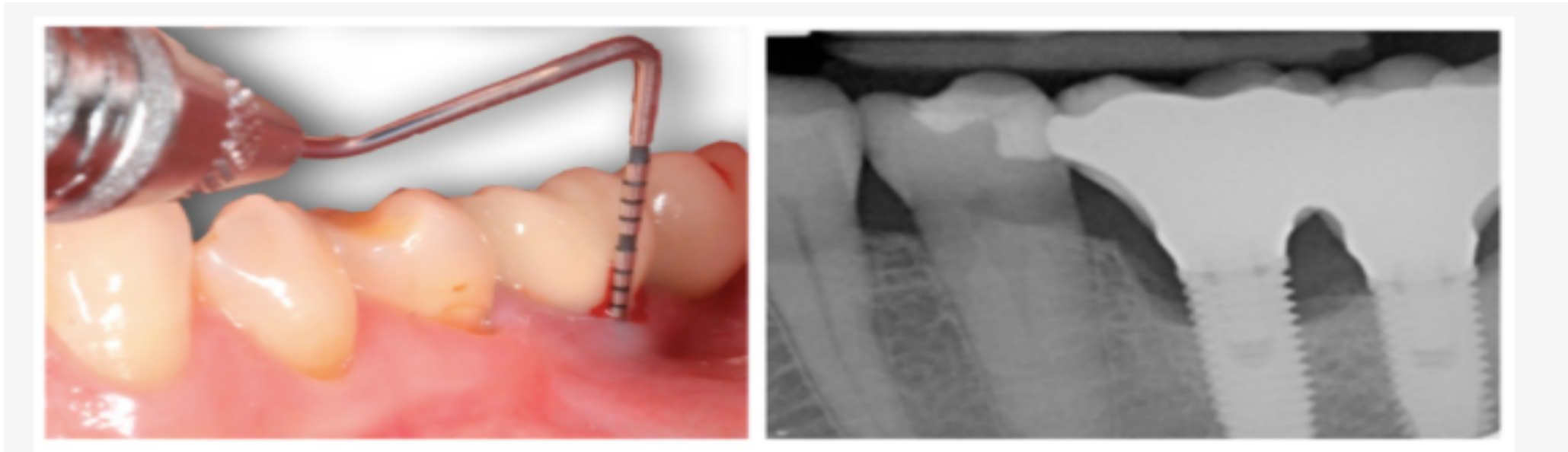
1. Dreyer, H, Grischke, J, Tiede, C, et al. Epidemiology and risk factors of peri-implantitis: A systematic review. *J Periodont Res.* 2018; 53: 657- 681. <https://0-doi-org.libus.csd.mu.edu/10.1111/jre.12562>

2. Lee, C., Huang, Y., Zhu, L., & Weltman, R. Prevalences of peri-implantitis and peri-implant mucositis: systematic review and meta-analysis (2017). *Journal of Dentistry*. 62: 1-12. doi:https://0-doi-org.libus.csd.mu.edu/10.1016/j.jdent.2017.04.011



D3 PICO

- **Clinical Question:**
What is the most successful way to treat peri-implantitis?



Picture source: <https://www.mdpi.com/2011-0383/8/2/219/html>

Template Revised 9/10/2020

PICO QUESTION

P: Patients with
infrabony bone loss
around an implant

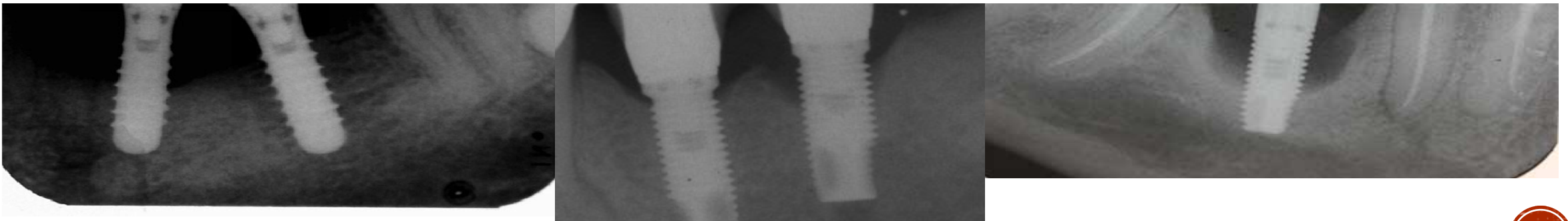
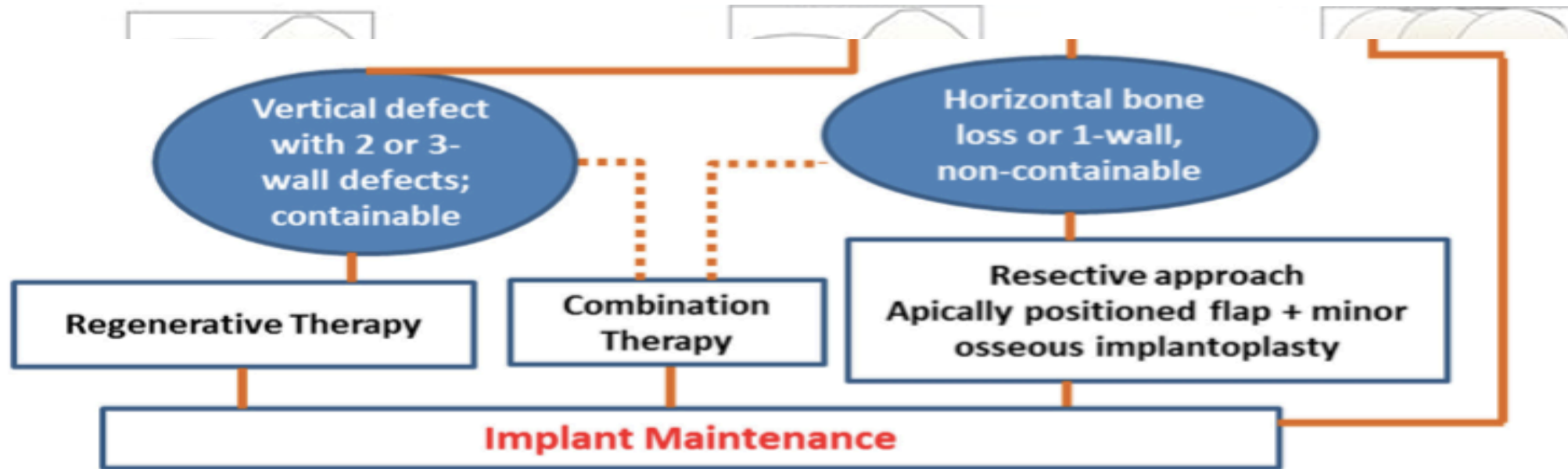
I: Non-surgical therapy
(SRP)

C: Surgical therapy
(bone graft or
biologicals)

O: Bone gain

- In a patient with infrabony bone loss around an implant, does non-surgical therapy have a comparable outcome to surgical therapy in terms of bone gain?

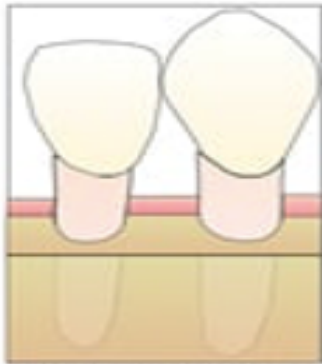
3 TYPES OF BONE LOSS CAUSED BY PERI-IMPLANTITIS



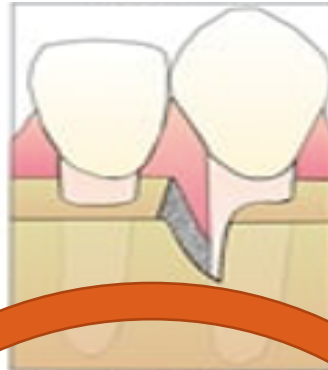
Refer to notes for picture source

Template Revised 9/10/2020

3 TYPES OF BONE LOSS CAUSED BY PERI-IMPLANTITIS



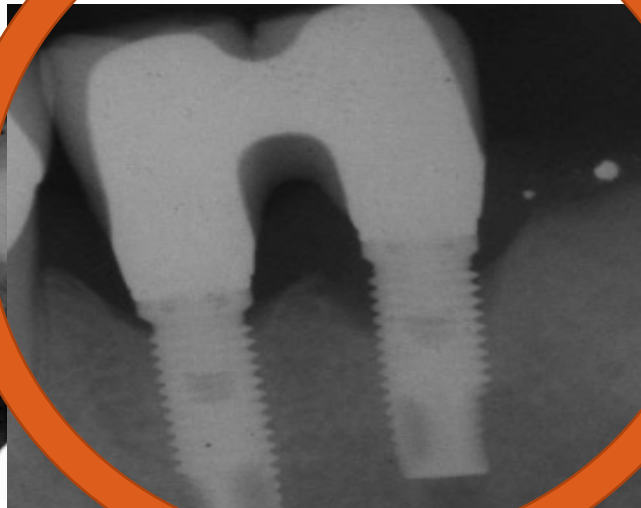
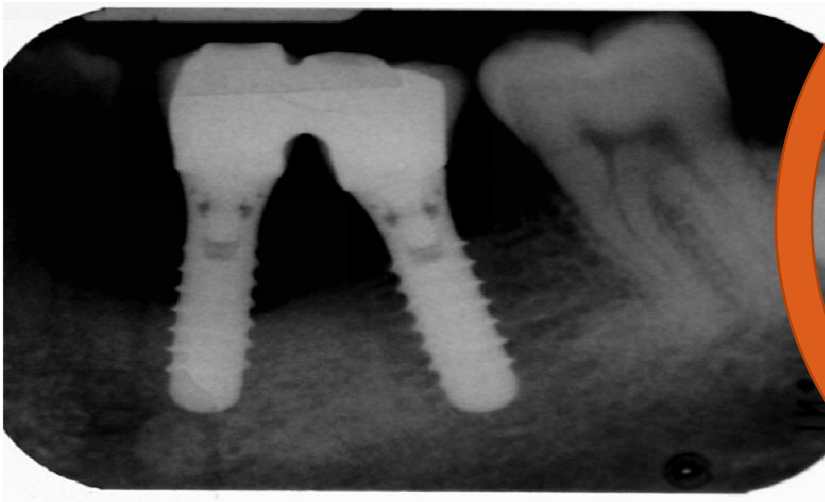
Suprabony (Horizontal) Defect



Infrabony (Vertical) Defect



Combination defect



Refer to notes for picture source

Template Revised 9/10/2020

NON-SURGERY VS. SURGERY THERAPY

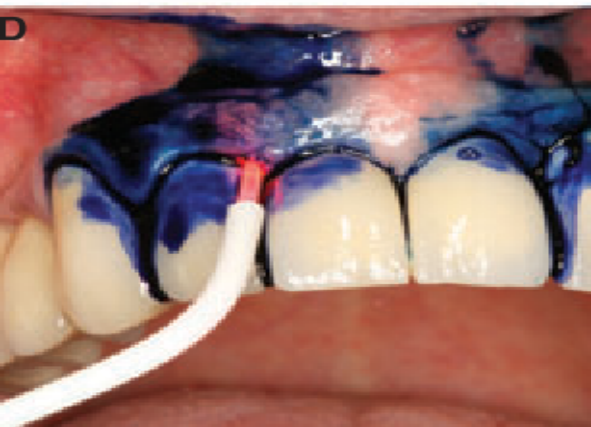


Figure 11. Implantoplasty removing contaminated HA coating of implant.



with a diode laser of 670 nm

CLINICAL BOTTOM LINE

- For effective treatment of infrabony defect in peri-implantitis, referring to a specialist for the proper surgical therapy is recommended.
- Depending on the type and cause of bone defect, there are different methods to treat peri-implantitis, however, there are conflicting results showing the effectiveness of non-surgical treatment on peri-implantitis with infrabony defect.

SEARCH BACKGROUND

- **Date(s) of Search: October 5~ 14, 2020**
- **Database(s) Used: PubMed**
- **Search Strategy/Keywords:**

Peri-implantitis management, infrabony therapy, non-surgical therapy, surgical therapy

SEARCH BACKGROUND

- **MESH terms used:**
 - **Peri-Implantitis therapy**
 - **Dental implants**
 - **Alveolar Bone Loss therapy**
 - **Combined Modality therapy**

ARTICLE 1 : NON-SURGICAL THERAPY

- Citation:

Suárez-López Del Amo F, Yu SH, Wang HL. Non-Surgical Therapy for Peri-Implant Diseases: a Systematic Review. J Oral Maxillofac Res. 2016 Sep 9;7(3):e13. doi: 10.5037/jomr.2016.7313. PMID: 27833738; PMCID: PMC5100638.

- Study Design:

A systemic review of RCT & cohort studies

- Study Need / Purpose: Investigate the effectiveness of non-surgical therapy for peri-implant mucositis or peri-implantitis

LEVELS OF EVIDENCE

- ☐ **1a** – Clinical Practice Guideline, Meta-Analysis, Systematic Review of Randomized Control Trials (RCTs)
- ☐ **1b** – Individual RCT
- ☐ **2a** – Systematic Review of Cohort Studies
- ☐ **2b** – Individual Cohort Study
- ☐ **3** – Cross-sectional Studies, Ecologic Studies, “Outcomes” Research
- ☐ **4a** – Systematic Review of Case Control Studies
- ☐ **4b** – Individual Case Control Study
- ☐ **5** – Case Series, Case Reports
- ☐ **6** – Expert Opinion without explicit critical appraisal, Narrative Review
- ☐ **7** – Animal Research
- ☐ **8** – In Vitro Research

ARTICLE 1 SYNOPSIS

- MEDLINE and EMBASE from 2011 to 2016
- Human studies reporting non-surgical treatment of peri-implant mucositis and peri-implantitis with more than 10 implants
- At least 6 months follow up
- in English language
- 14 studies (9 RCT, 4 cohort, 1 case series)

ARTICLE 1 SYNOPSIS

- **Limitation:** Significant heterogeneity between each studies.
- Different definition of peri-implant disease, different implant designs & defect characteristics.
- Various studies used different methods for implant decontamination
- **Conclusion:** Non-surgical treatment for peri-implant mucositis appeared to be effective while for peri-implantitis, non-surgical treatment provided modest or unpredictable outcomes.

ARTICLE 1 SELECTION

Reason for selection:

- Investigated non-surgical treatment outcomes for peri-implantitis that reported clinical and/or radiographic changes.

Bassetti et al. [21]	2014	RCT	Control	Instructions in the use of superfloss	MD + Airpolishing + 3% hydrogen peroxide irrigation + Arestin	20	20	12	Peri-implantitis	4.39 (0.77) to 3.83 (0.85)
			Test		MD + Airpolishing + PDT (660 nm, power density 100 mW) + 3% hydrogen peroxide irrigation energy: 1.5 J; spot diameter: 1 mm)	20	20			4.19 (0.55) to 4.08 (0.81)

STRENGTH OF RECOMMENDATION TAXONOMY (SORT)

☐	A – Consistent, good quality patient oriented evidence
☒	B – Inconsistent or limited quality patient oriented evidence
☐	C – Consensus, disease oriented evidence, usual practice, expert opinion, or case series for studies of diagnosis, treatment, prevention, or screening

Double click table to activate check-boxes

ARTICLE 2: SURGICAL MANAGEMENT OF PERI-IMPLANTITIS

- Citation:

Chan HL, Lin GH, Suarez F, MacEachern M, Wang HL. Surgical management of peri-implantitis: a systematic review and meta-analysis of treatment outcomes. J Periodontol. 2014 Aug;85(8):1027-41. doi: 10.1902/jop.2013.130563. Epub 2013 Nov 21. PMID: 24261909.

- Study Design: Systematic Review/Meta-analysis

- Study Need / Purpose: Requested by the Task Force of The American Academy of Periodontology, with an aim to investigate the efficacy of different surgical approaches to treat peri-implantitis

LEVELS OF EVIDENCE

- ☐ **1a** – Clinical Practice Guideline, Meta-Analysis, Systematic Review of Randomized Control Trials (RCTs)
- ☐ **1b** – Individual RCT
- ☐ **2a** – Systematic Review of Cohort Studies
- ☐ **2b** – Individual Cohort Study
- ☐ **3** – Cross-sectional Studies, Ecologic Studies, “Outcomes” Research
- ☐ **4a** – Systematic Review of Case Control Studies
- ☐ **4b** – Individual Case Control Study
- ☐ **5** – Case Series, Case Reports
- ☐ **6** – Expert Opinion without explicit critical appraisal, Narrative Review
- ☐ **7** – Animal Research
- ☐ **8** – In Vitro Research

ARTICLE 2 SYNOPSIS

- MEDLINE, PubMed, EMBASE, Dentistry and Oral Sciences Sources from Jan 1990 to May 2013
- 21 human clinical trials - 5 RCTs, 12 case series, 1 cohort studies, 3 quasi-experiments
- English language
- Sample size of minimum 8 surgically treated screw implants
- Follow-up period of minimum 6 months.
- The focus question: What are the radiographic and clinical outcomes of different surgical interventions for the treatment of peri-implantitis?
- 4 surgical treatment groups were identified, which are access flap and debridement, surgical resection, application of bone grafting materials, and guided bone regeneration.

ARTICLE 2 SYNOPSIS

- **Limitations:** heterogeneity in the study design, case selection, and treatment provided. One of the RCTs was shown to have a high bias.

- **Conclusion:**

Within the limitation of this systematic review, application of grafting materials and barrier membranes resulted in greater PD reduction and average radiographic bone fill of ~ 2mm.

ARTICLE 2 SELECTION

- **Evaluated radiographic bone fill (RBF) of surgically treated peri-implantitis as one of the parameters investigated.**

Study No.-Intervention Arm No.	Authors (Year)	Intervention	No. of Implants	Mean $\pm$ SD PD Reduction (mm)	PD Reduction (%)	Mean $\pm$ SD Bone Fill (mm)	Mean $\pm$ SD CAL Gain (mm)	CAL Reduction (%)	BOP Reduction (%)	Mean $\pm$ SD MR (mm)
9-1	Roccuzzo et al. (2011) ⁵²	XG, R (SLA)	12	3.4 $\pm$ 1.7	50	1.9 $\pm$ 1.3	NA	NA	60.4	NA
9-2		XG, R (TPS)	14	2.1 $\pm$ 1.2	29.2	1.6 $\pm$ 0.7	NA	NA	33.9	NA
10-1	Roos- Jansäker et al. (2011) ⁵³	PCC	27	NA	NA	1.3 $\pm$ 1.3	NA	NA	NA	NA
11	Wiltfang et al. (2012) ⁵⁶	Auto + XG	36	4.0 $\pm$ 1.8	NA	3.5 $\pm$ 2.4	NA	NA	36	1.3 $\pm$ 0.2
4-2	Wohlfahrt et al. (2012) ¹⁹	PTG	16	1.7 $\pm$ 1.7	26.2	2.0 $\pm$ 1.7	NA	NA	NA	NA
12	Mijiritsky et al. (2013) ⁵¹	PTG	18	NA	NA	2.0 $\pm$ 2.3	NA	NA	NA	NA

STRENGTH OF RECOMMENDATION TAXONOMY (SORT)

☐	A – Consistent, good quality patient oriented evidence
☒	B – Inconsistent or limited quality patient oriented evidence
☐	C – Consensus, disease oriented evidence, usual practice, expert opinion, or case series for studies of diagnosis, treatment, prevention, or screening

Double click table to activate check-boxes

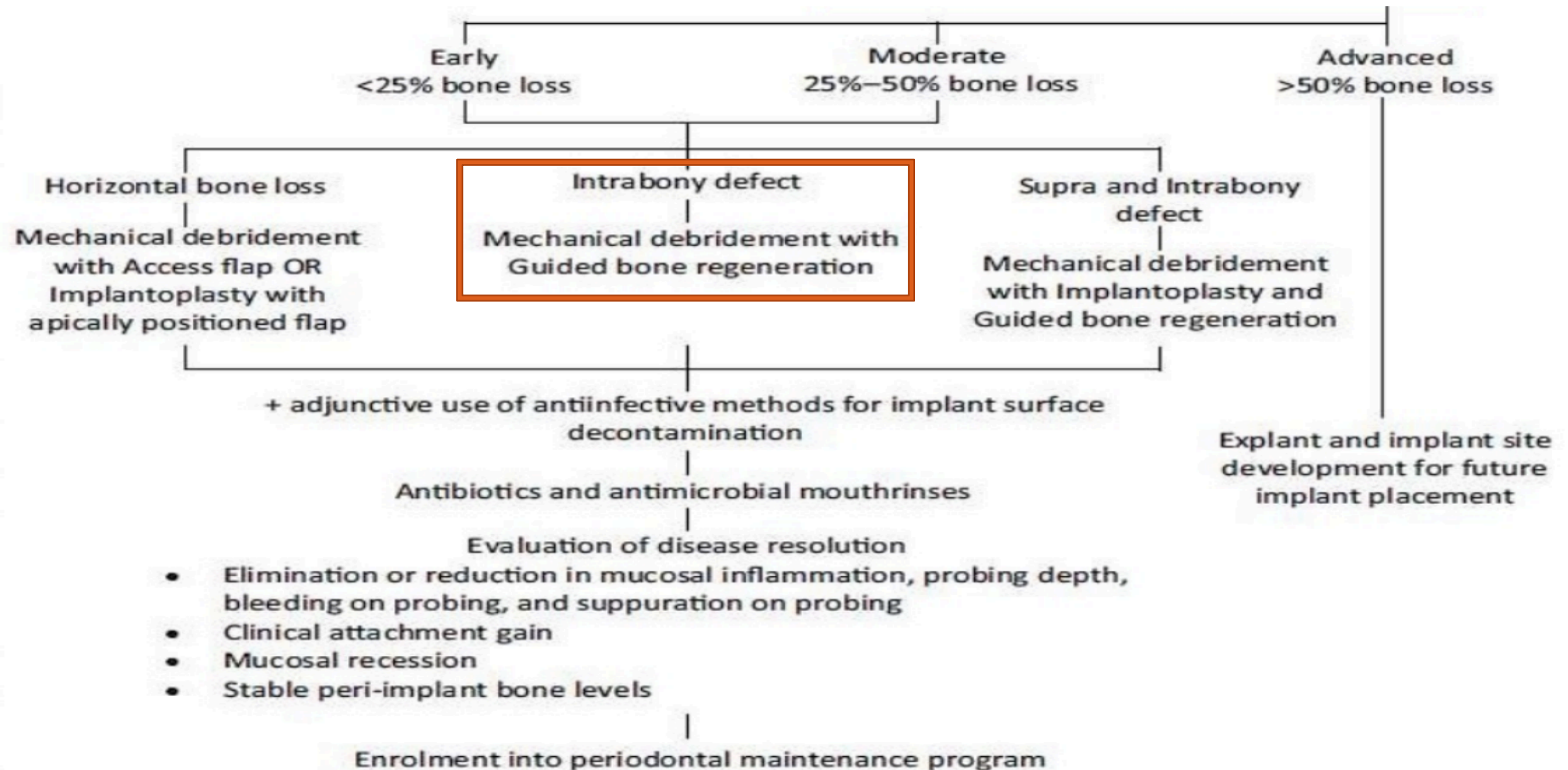
ARTICLE 3: SYSTEMIC LITERATURE REVIEW

- Romanos GE, Javed F, Delgado-Ruiz RA, Calvo-Guirado JL. Peri-implant diseases: a review of treatment interventions. Dent Clin North Am. 2015 Jan;59(1):157-78. doi: 10.1016/j.cden.2014.08.002. Epub 2014 Oct 7. PMID: 25434564.
- Authors' proposed guidelines for the management of peri-implantitis
 1. Elevation of a full-thickness mucoperiosteal flap
 2. MD using hand instruments, then CO2 laser
 3. GBR particulate graft & resorbable membrane
 4. Closure of defect using resorbable sutures

CONCLUSIONS: D3

Based on the above considerations, how will you advise your D4?





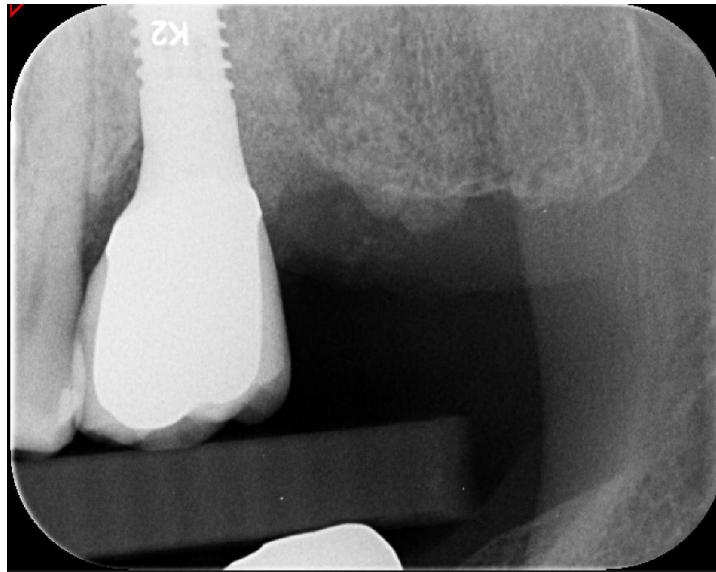
CONCLUSIONS : D4

- Based off the D3's bottom line...
- Patient should have surgical/mechanical debridement with Guided Bone Regeneration to help gain bone in the area of peri-implantitis.
- Work on OHI with patient



WHAT HAPPENED?

- Perio resident treated with guided bone regeneration
 - Incision and degranulation
 - Cleaned implant surface with doxycycline and saline
 - Used bone graft to fill crater defect
 - Placed membrane over bone graft
 - Sutured

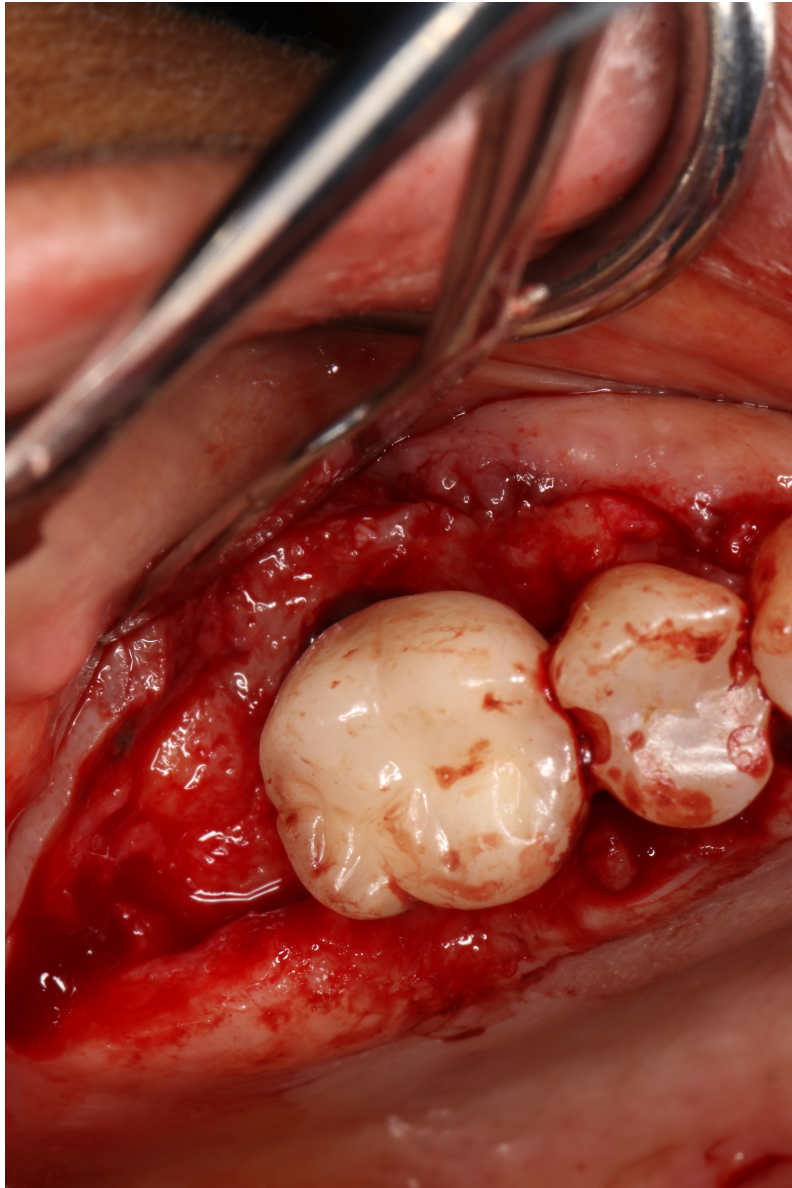


8/20
After Bone
Graft

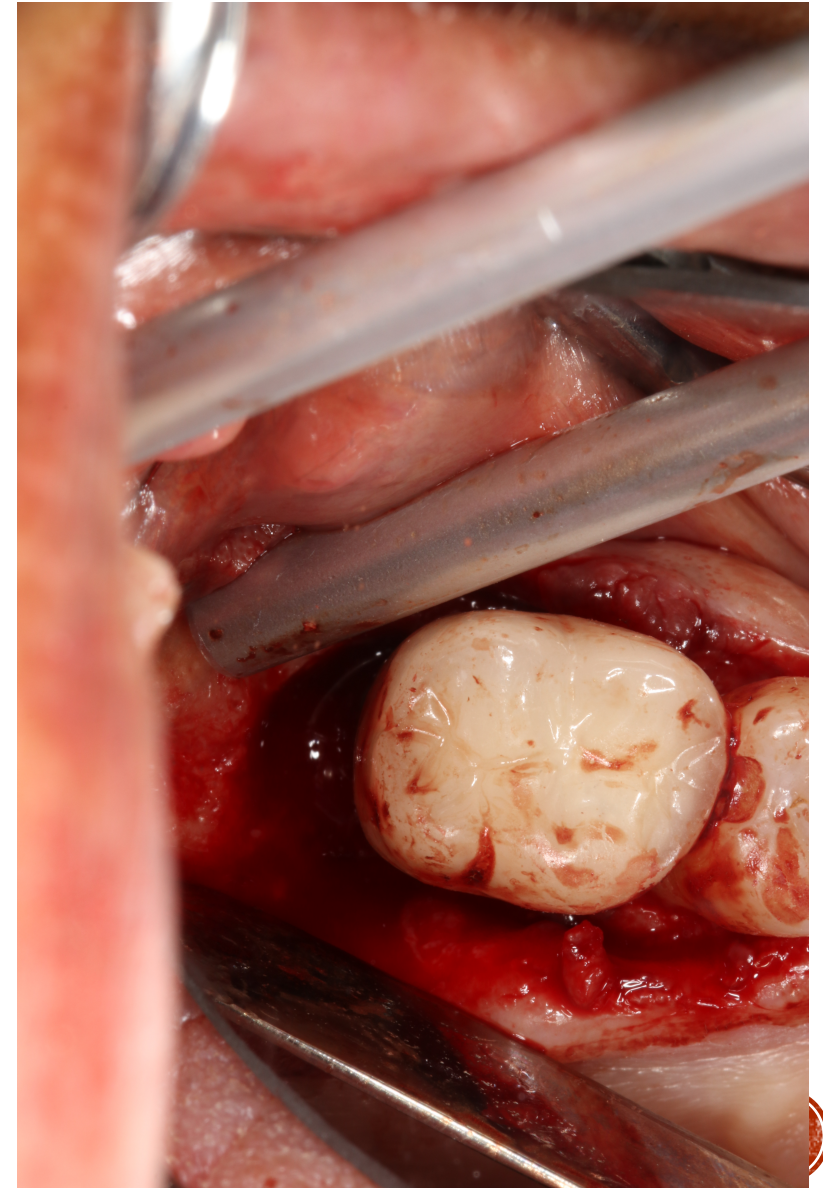


SURGICAL PICTURES

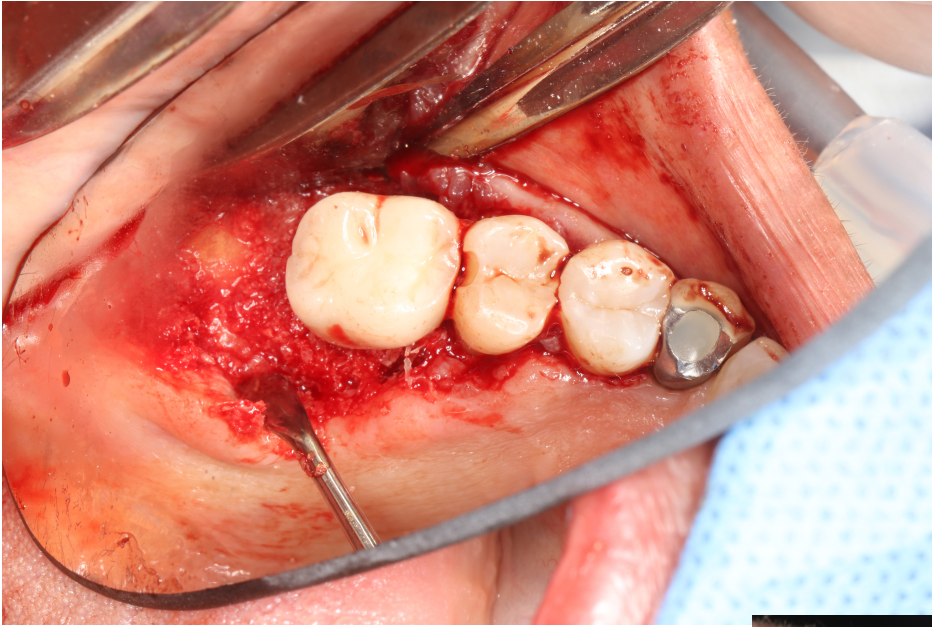
After Incision



After
Degranulation

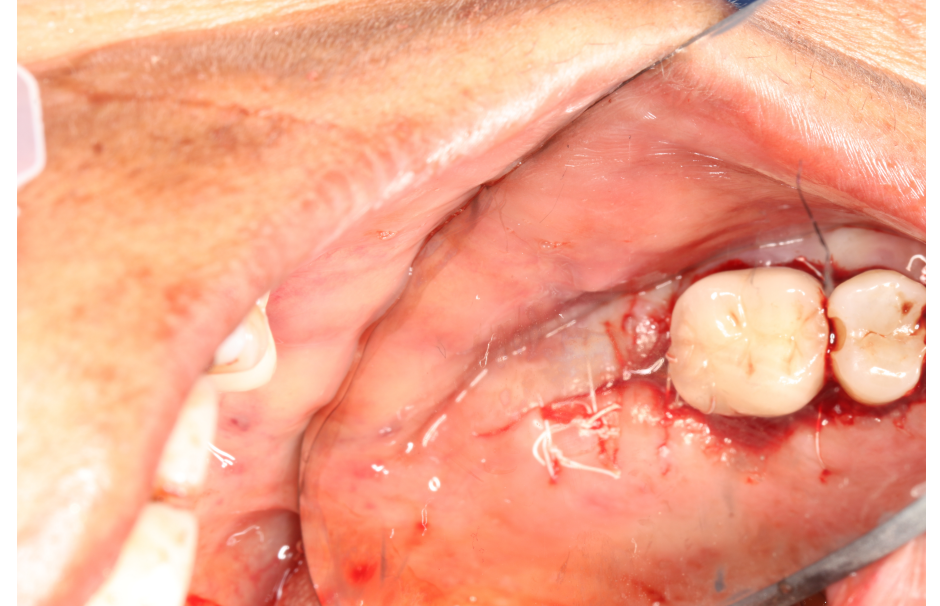


SURGICAL PICTURES

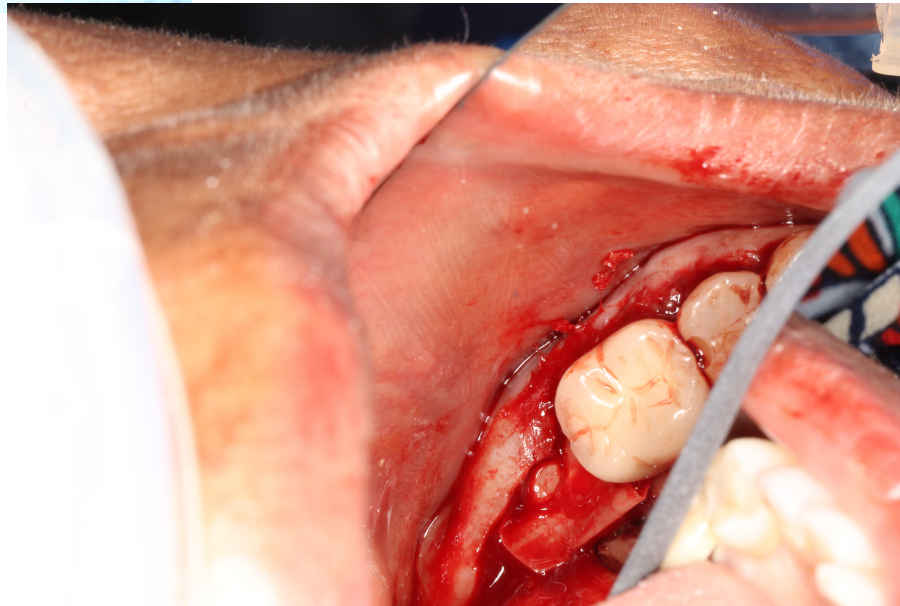


Bone Graft

Membrane



Sutures



POST-OP PICTURES





THANK YOU!

