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"

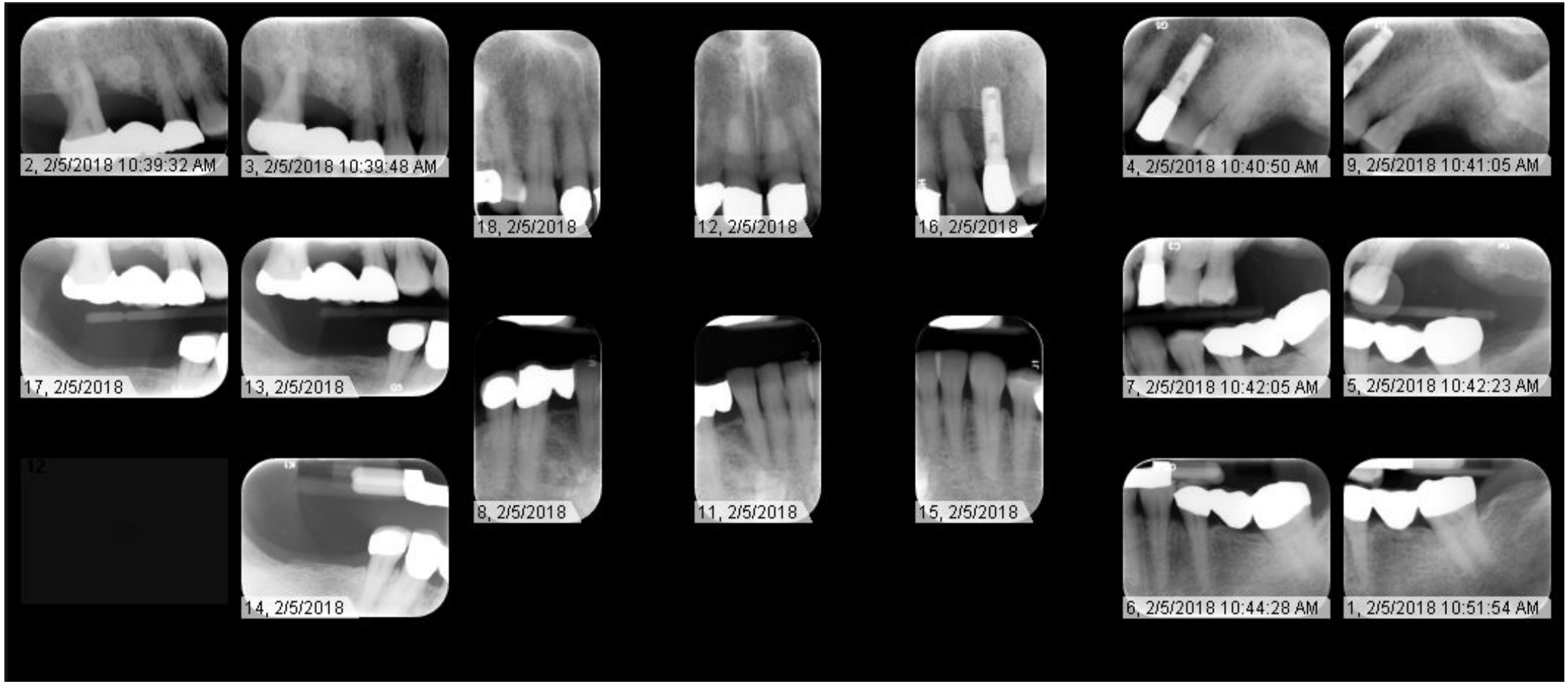
MEDICAL HISTORY

- 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

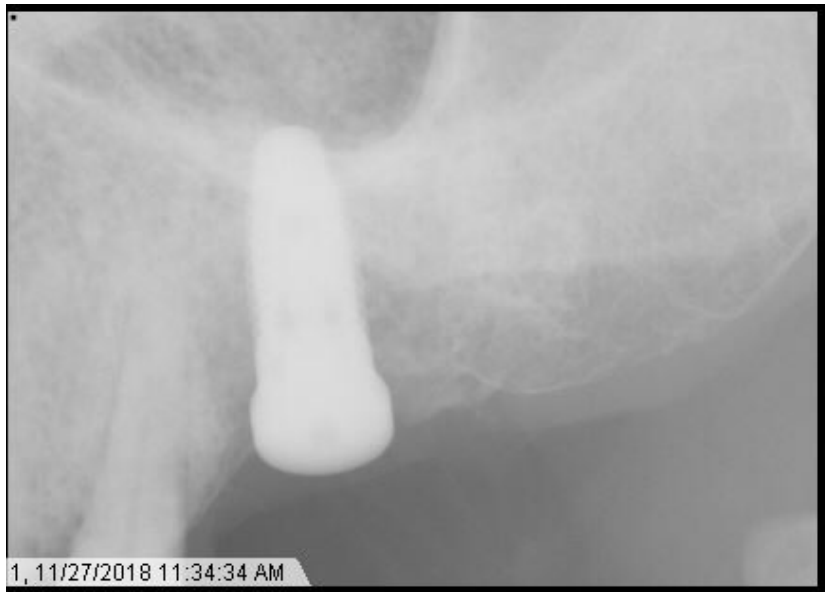
RADIOGRAPHS – FMX 2018



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

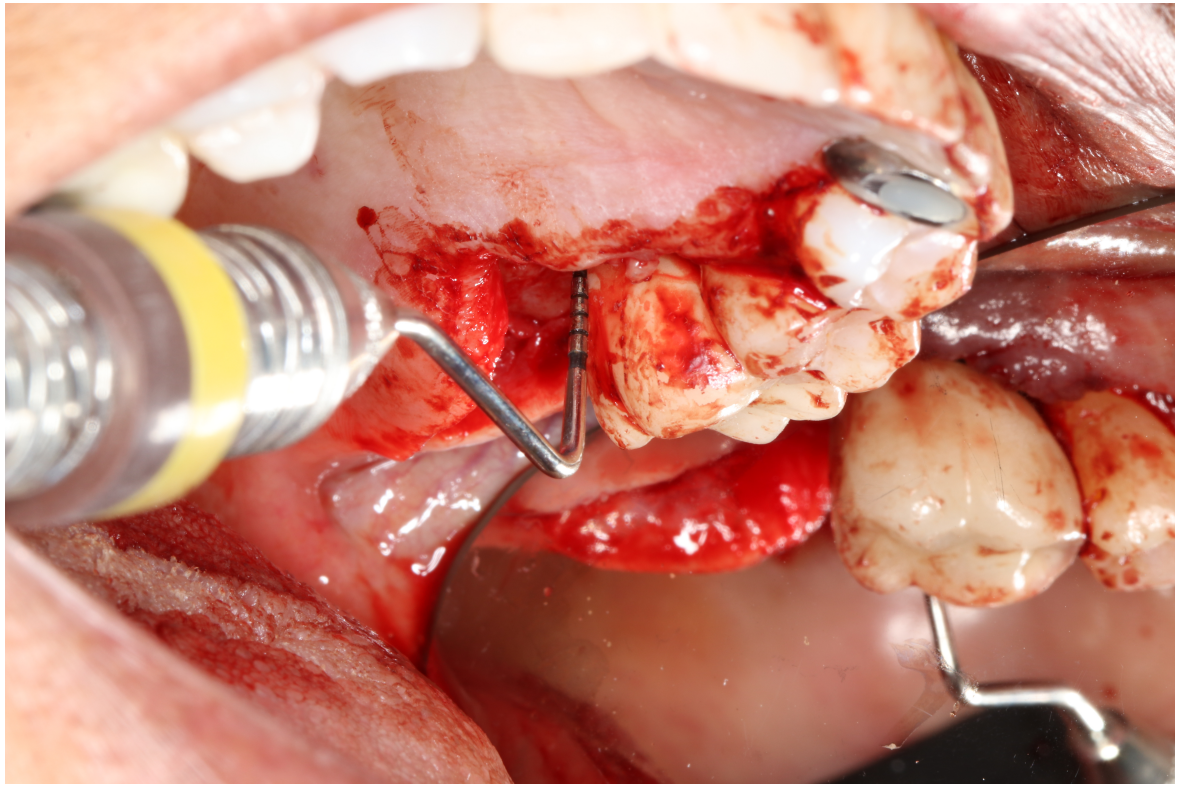
3. 7/20
Transfer Exam – crater defect

- 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



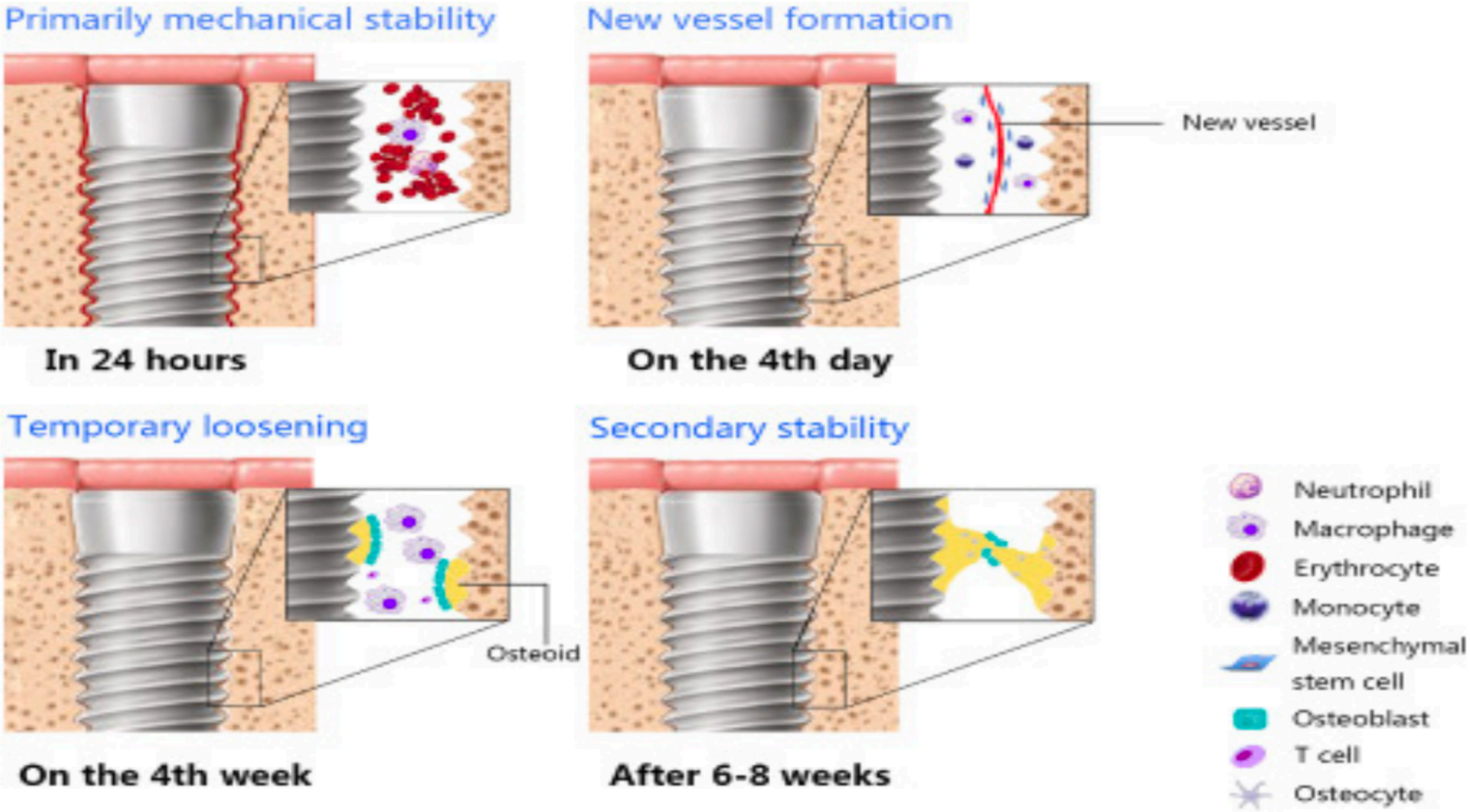
PERIODONTAL DIAGNOSIS

- 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?

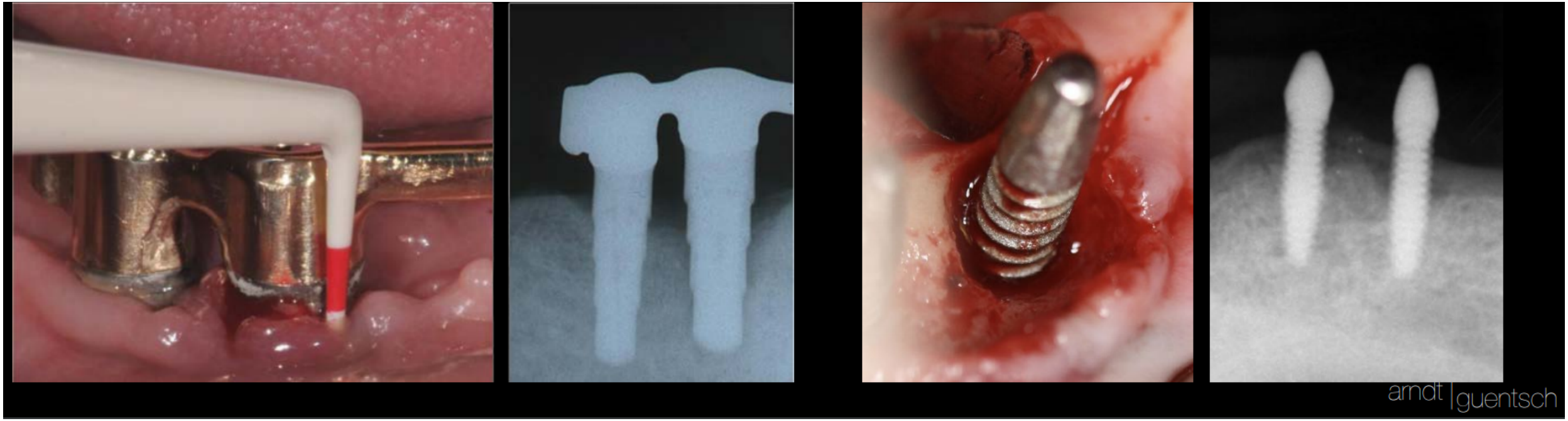


Wang, Yulan & Zhang, Yufeng & Miron, Richard. (2015). Health, Maintenance, and Recovery of Soft Tissues around Implants: Soft Tissues around Implants. Clinical implant dentistry and related research. 18. 10.1111/cid.12343.

PERI-IMPLANTITIS

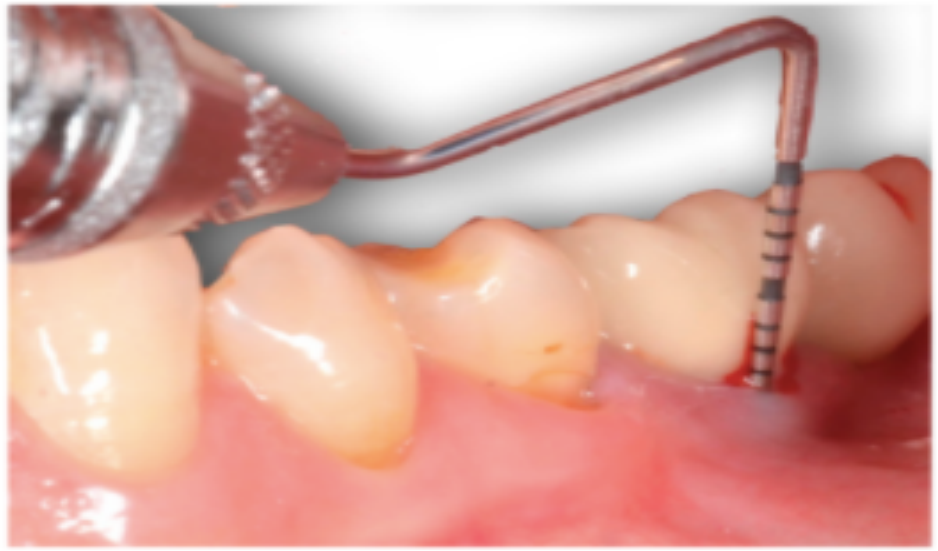
- Inflammatory reaction from loss of supporting bone around implant[1]
  - Inflammation, BOP, increased pocket depths, progressive bone loss, 2-3 mm bone loss radiographically, >6mm probing depths[1]
- Smoking, diabetes mellitus, lack of prophylaxis, history of periodontitis[2]

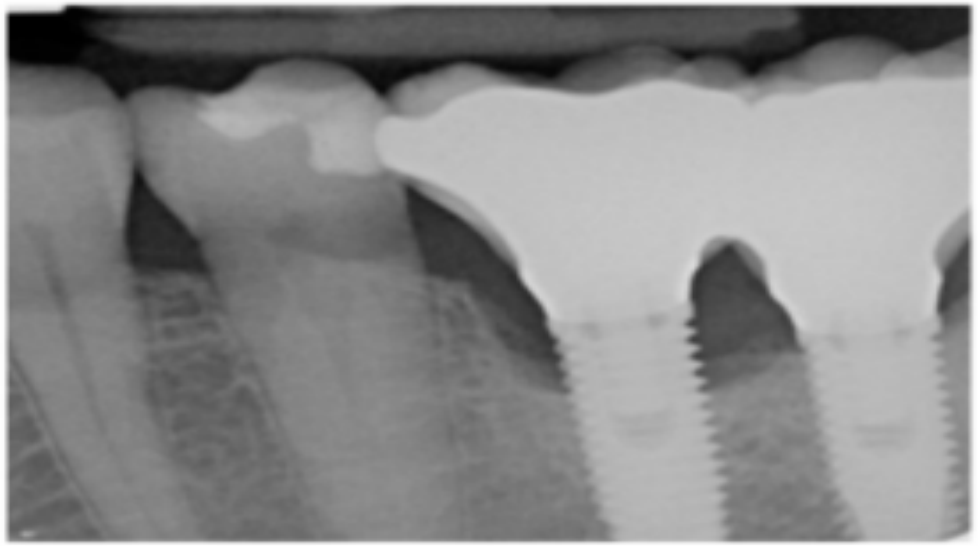
1. Dreyer, H, Grischke, J, Tiede, C, et al. **Epidemiology and risk factors of peri‐implantitis: A systematic review**. *J Periodont Res*. 2018; 53: 657- 681. https://0-doi-org.libus.csd.mu.edu/10.1111/jre.12562
2. Lee, C., Huang, Y., Zhu, L., & Weltman, R. **Prevalences of peri-implantitis and peri-implant 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
Image: Guentsch, A. **Peri-Implant Diseases and Conditions.** *Marquette University School of Dentistry.* Class Presentation.



D3 PICO

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





Picture source: https://www.mdpi.com/2077-0383/8/2/219/htm

PICO QUESTION

P: Patients with infrabony bone loss around an implant

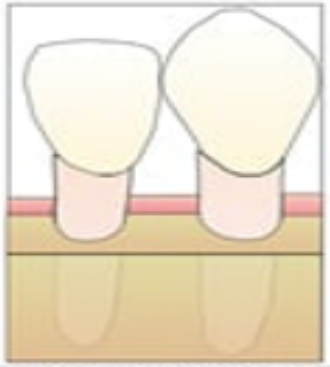
I: Non-surgical therapy (SRP)

C: Surgical therapy (bone graft or biologicals)

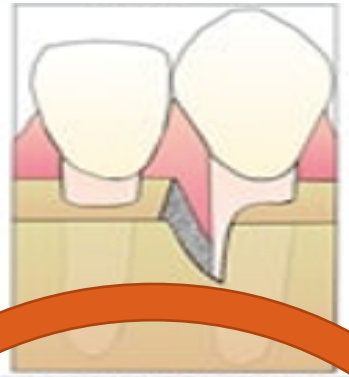
O: Bone gain

- 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

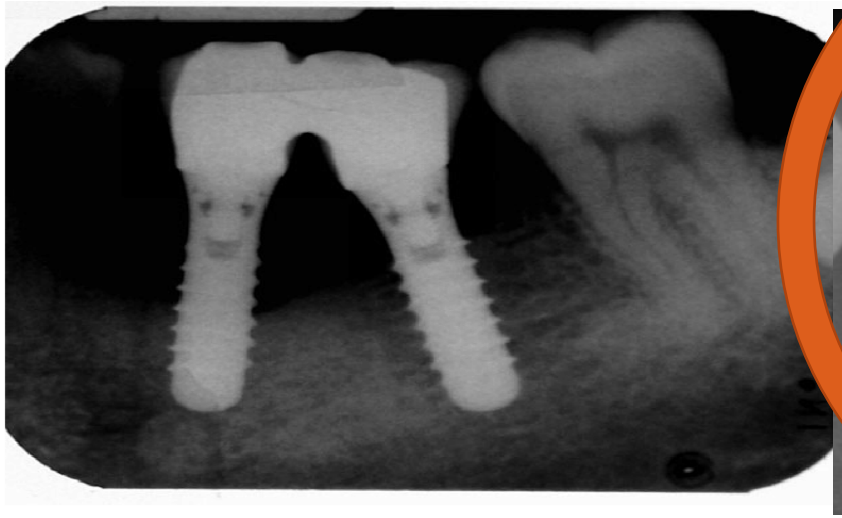


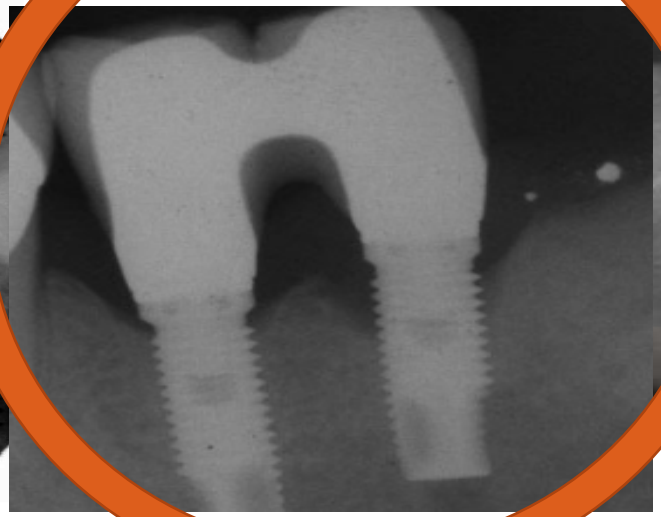
Suprabony (Horizontal) Defect

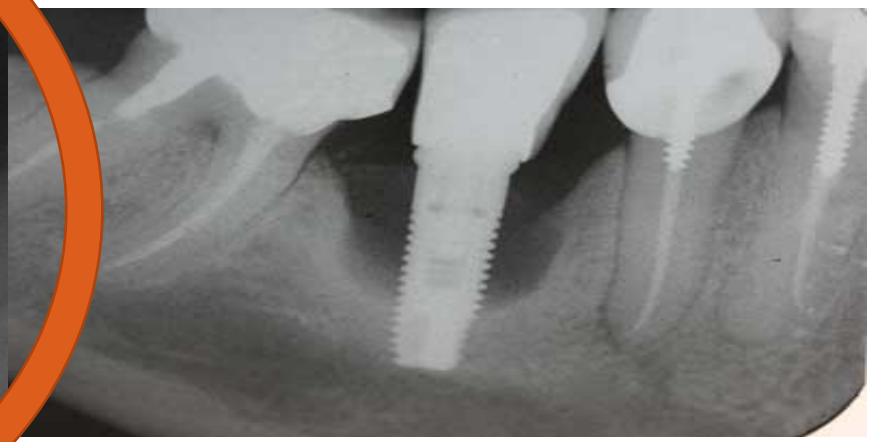


Infrabony (Vertical) Defect

Combination defect







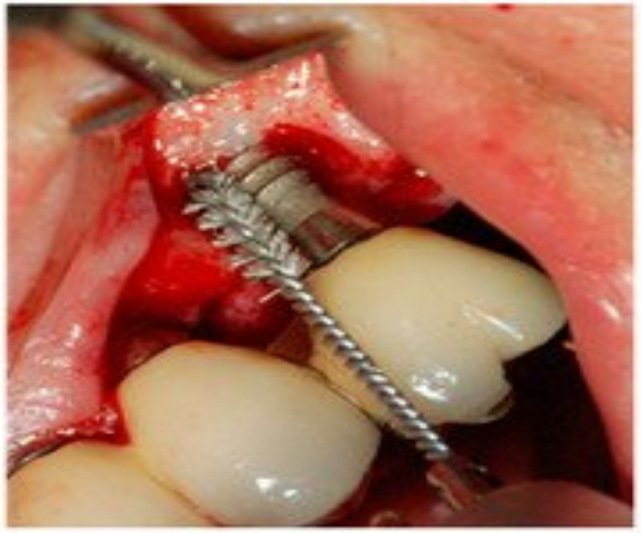
Refer to notes for picture source

NON-SURGERY VS. SURGERY

Fig. 6. Nonsurgical treatment of peri-implant diseases using hand instruments.

(a)

(b)



(c)

Picture sources in the

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

Double click table to activate check-boxes

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.**

Study	Year of publication	Type of study	Groups	Treatment provided		N patients	N implants	Follow-up (months)	Diagnosis		
				Self-performed	Professionally-delivered				Mucositis/ peri-implantitis	PDs reduction Mean (SD), mm	Radiographic MBL changes Mean (SD), mm
Arisan et al. [20]	2015	RCT	Control	OHI	MD	5	24	6	Peri-implantitis	4.38 (0.42) to 4.17 (0.41)	2.35 (0.56) to 2.63 (0.53)
			Test	OHI	MD + diode laser 810 nm (energy density: 3 J/cm²; time: 1 min; power density: 400 mW/cm²; energy: 1.5 J; spot diameter: 1 mm)	5	24			4.71 (0.67) to 4.54 (0.74)	2.13 (0.47) to 2.79 (0.48)

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
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Double click table to activate check-boxes

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 ± SD PD Reduction (mm)	PD Reduction (%)	Mean ± SD Bone Fill (mm)	Mean ± SD CAL Gain (mm)	CAL Reduction (%)	BOP Reduction (%)	Mean ± SD MR (mm)
9–1	Roccuzzo et al. (2011)[52]	XG, R (SLA)	12	3.4 ± 1.7	50	1.9 ± 1.3	NA	NA	60.4	NA
9–2		XG, R (TPS)	14	2.1 ± 1.2	29.2	1.6 ± 0.7	NA	NA	33.9	NA
10-1	Roos- Jansåker et al. (2011)[53]	PCC	27	NA	NA	1.3 ± 1.3	NA	NA	NA	NA
11	Wiltfang et al. (2012)[56]	Auto + XG	36	4.0 ± 1.8	NA	3.5 ± 2.4	NA	NA	36	1.3 ± 0.2
4–2	Wohlfahrt et al. (2012)[19]	PTG	16	1.7 ± 1.7	26.2	2.0 ± 1.7	NA	NA	NA	NA
12	Mijiritsky et al. (2013)[51]	PTG	18	NA	NA	2.0 ± 2.3	NA	NA	NA	NA

STRENGTH OF RECOMMENDATION TAXONOMY (SORT)

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☐	**C** – Consensus, disease oriented evidence, usual practice, expert opinion, or case series for studies of diagnosis, treatment, prevention, or screening

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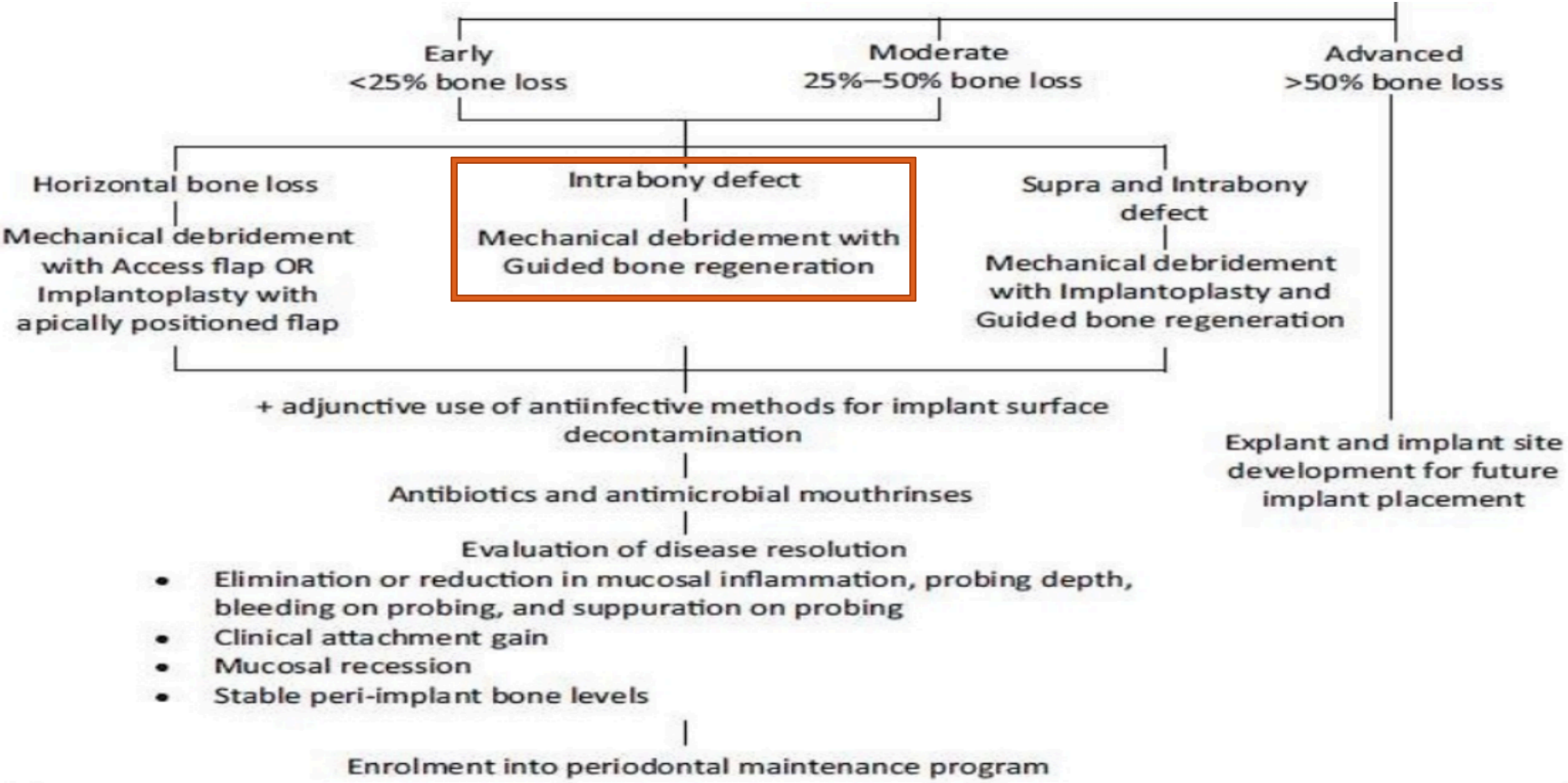
ARTICLE 3: SYSTEMIC LITERATURE REVIEW

- 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 particular graft & resorbable membrane
    4. Closure of defect using resorbable sutures

CONCLUSIONS: D3

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

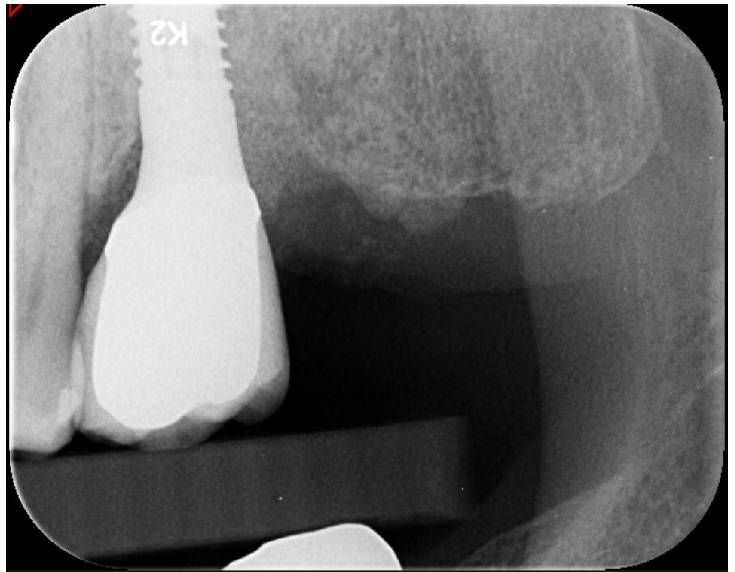

Early
<25% bone loss
Moderate
25%–50% bone loss
Advanced
>50% bone loss
Horizontal bone loss
Intrabony defect
Supra and Intrabony defect
Mechanical debridement with Access flap OR Implantoplasty with apically positioned flap
Mechanical debridement with Guided bone regeneration
Mechanical debridement with Implantoplasty and Guided bone regeneration
+ adjunctive use of antiinfective methods for implant surface decontamination
Explant and implant site development for future implant placement
Antibiotics and antimicrobial mouthrinses
Evaluation of disease resolution
Elimination or reduction in mucosal inflammation, probing depth, bleeding on probing, and suppuration on probing
Clinical attachment gain
Mucosal recession
Stable peri-implant bone levels
Enrolment into periodontal maintenance program

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

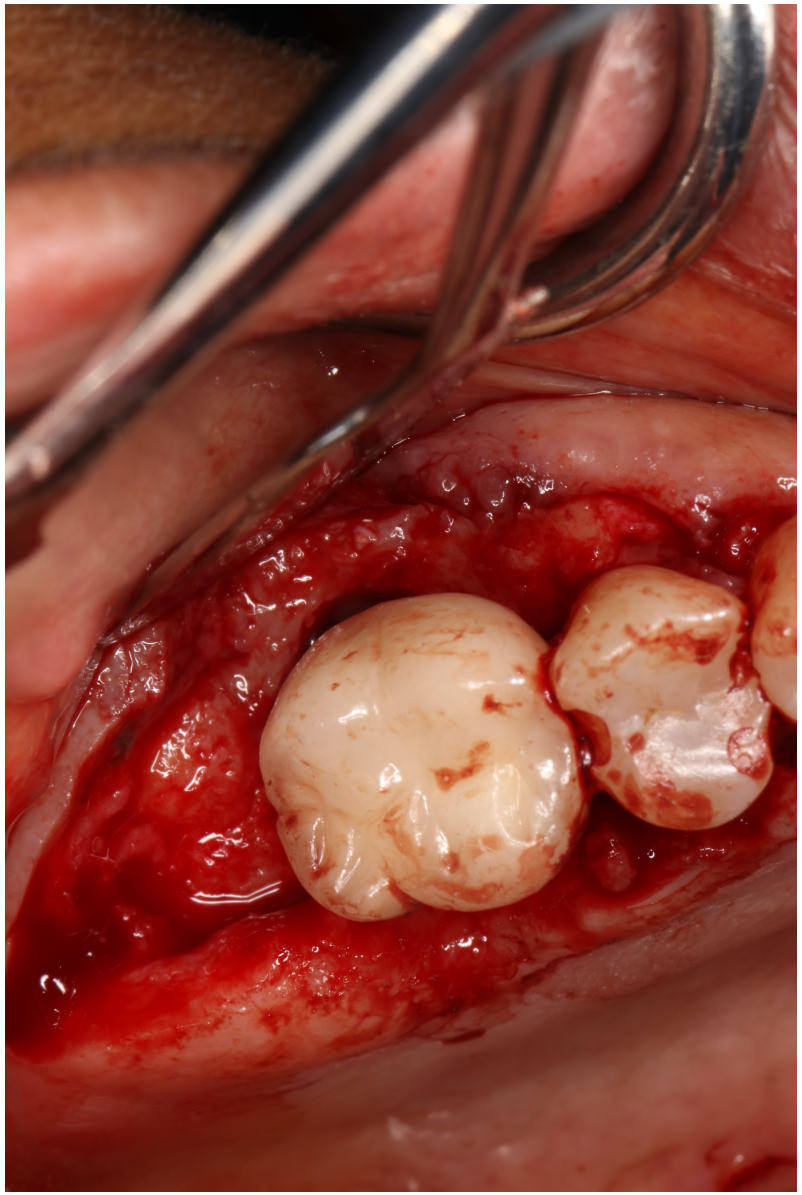
WHAT HAPPENED?

- 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



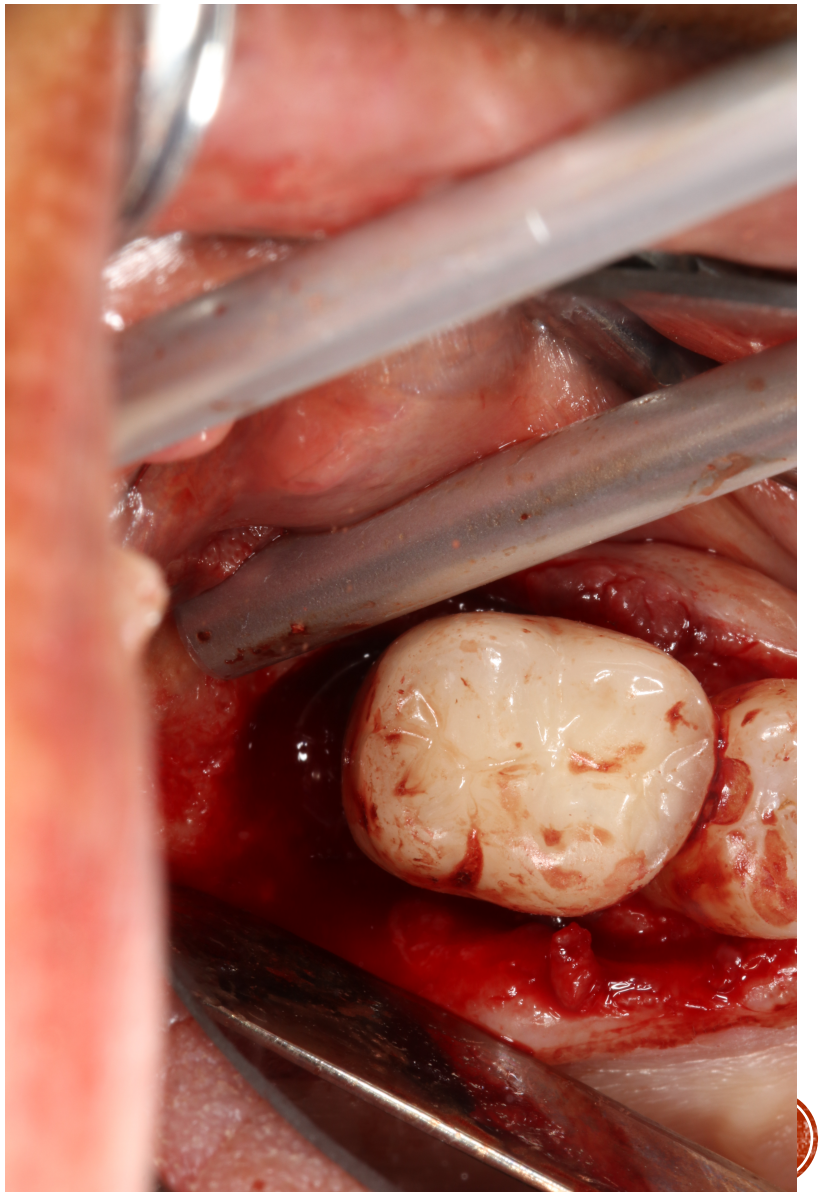
8/20
After Bone Graft

SURGICAL PICTURES

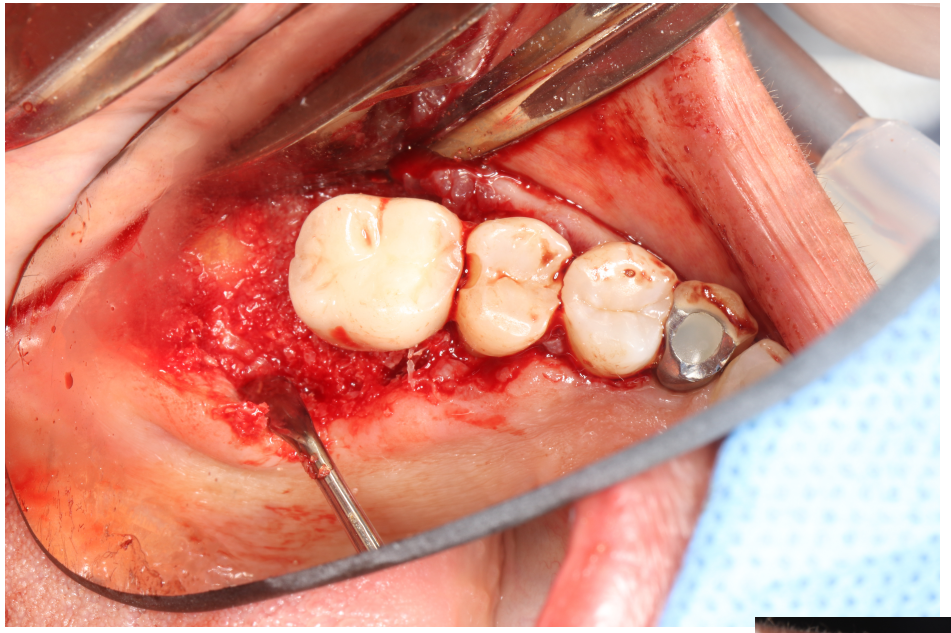


After Incision

After Degranulation

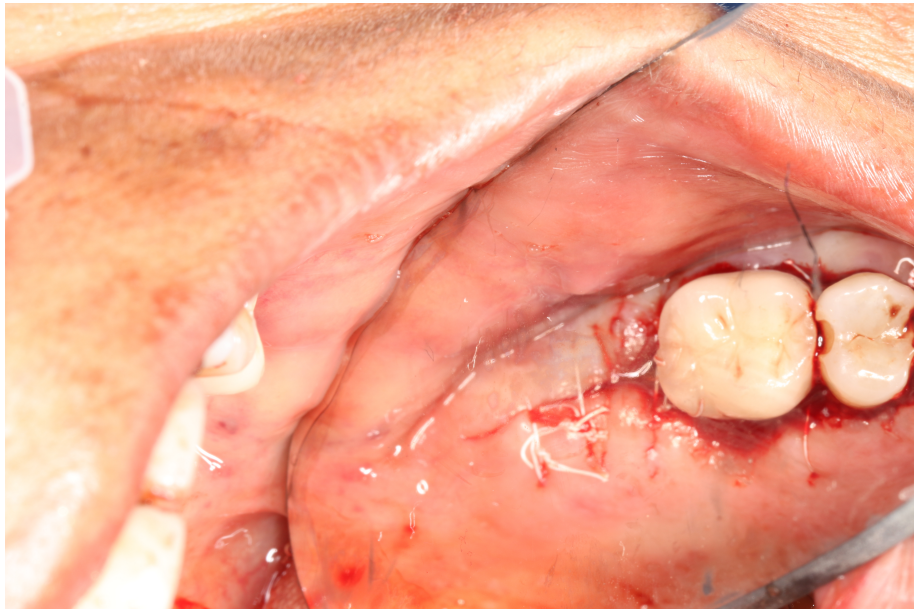


SURGICAL PICTURES



Bone Graft

Membrane



Sutures

POST-OP PICTURES

THANK YOU!