# Material Selection for Long-span Fixed Partial Dentures

## Evidence Based Dentistry Rounds
## Dental Materials

**Group 5A-3**
**Maisie Tolzmann, Kimberly Kaiser, Nadiya Choi, Greta Hevesi**

**11/11/2020**

# Rounds Team

- **Group Leader:** Dr. Dix
- **Specialty Leader:** Dr. Berzins
- **Project Team Leader:** D4 – Maisie Tolzmann
- **Project Team Participants:**
  - D1: Greta Hevesi
  - D2: Nadiya Choi
  - D3: Kimberly Kaiser

# Patient

- Age: 74
- Gender: Female
- Ethnicity: White
- Chief Complaint
  - "I want to get these front teeth replaced."

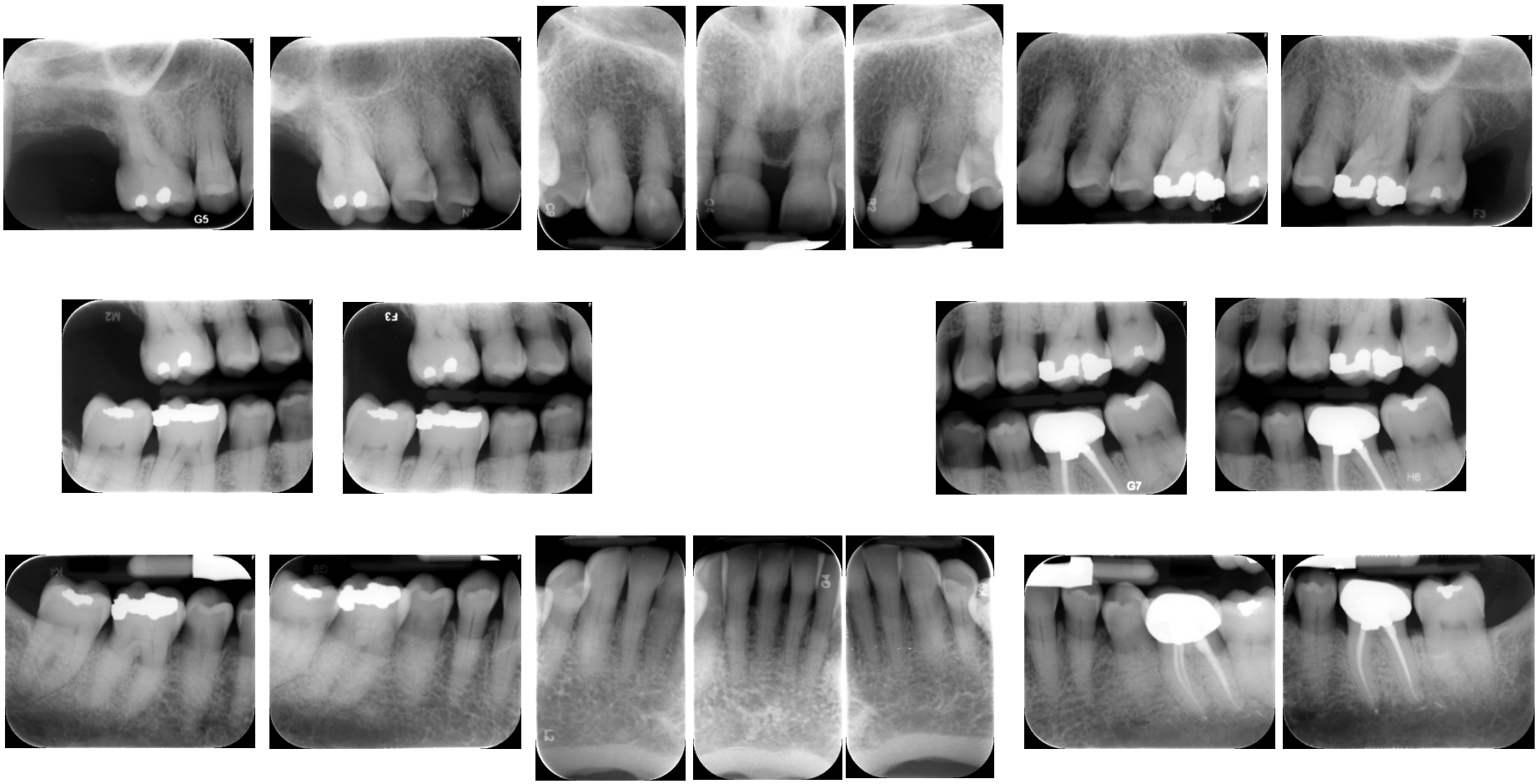
# Medical History

- **Medical Conditions**: Hypertension, atrial fibrillation, hypothyroidism, stage 3 renal insufficiency
- **Medications:** Amlodipine, amiodarone, aspirin, levothyroxine, zinc, vitamin D3, refresh ophthalmic solution
- Left hip replacement in 2015
  - Medical consult to orthopedic surgeon stated no antibiotic premedication required for dental treatment
- Treatment considerations
  - Avoid NSAIDs due to poor kidney function

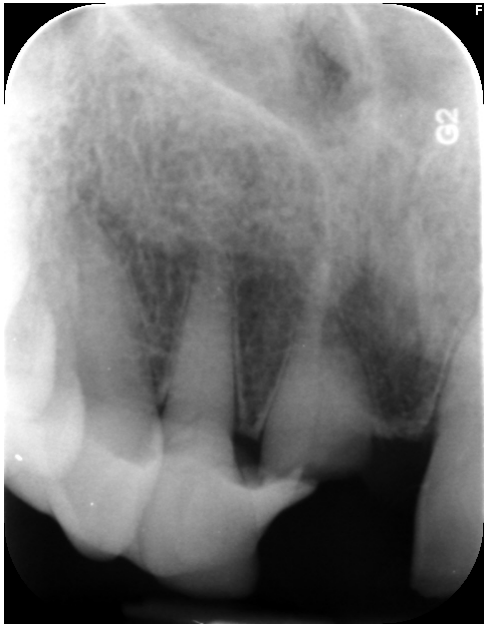
# Dental History

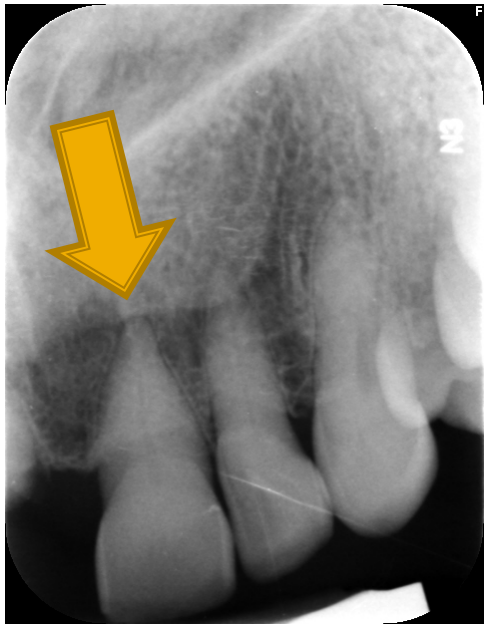
- **SRP in UL, LL, LR, in November of 2019**
  - 4-month periodontal maintenance
- **Pt. fell in December of 2019**
  - **#7** deemed non-restorable after splint was removed due to level of fracture
  - **#8** fractured when pt. fell, deemed non-restorable
  - **#9** necrotic pulp with symptomatic apical periodontitis. Pt. chose to proceed with extraction rather than RCT
  - Tx partial delivered after extractions

# Radiographs – Spring 2019



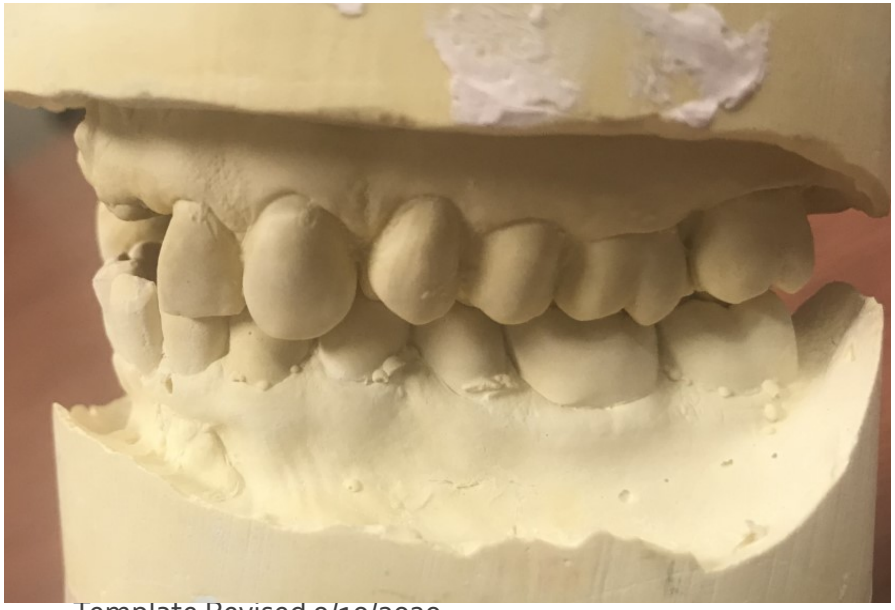
# Radiographs – taken after injury

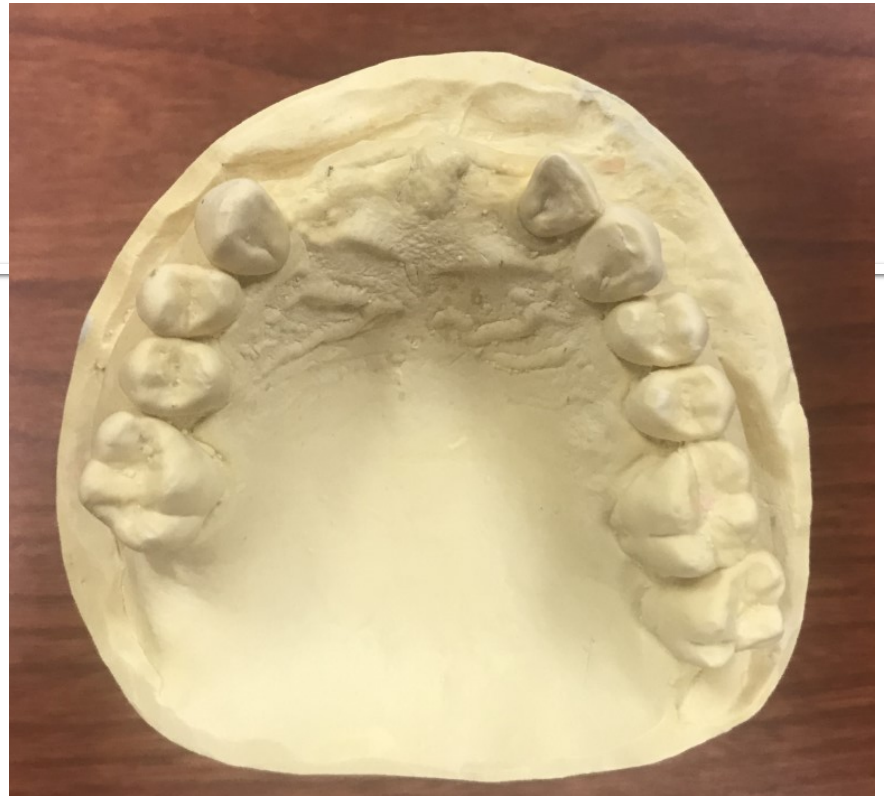


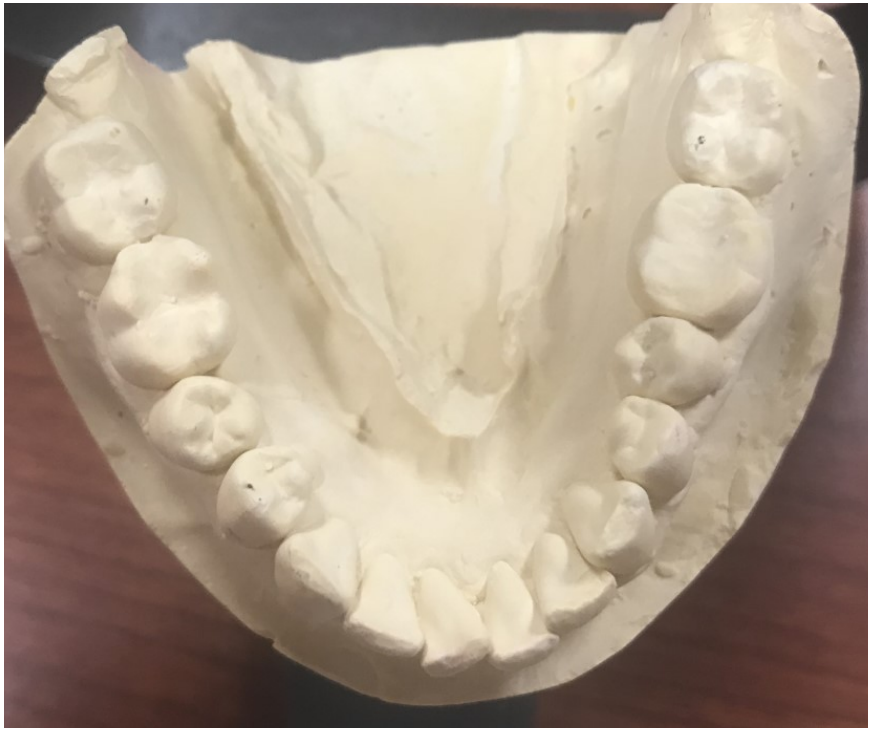



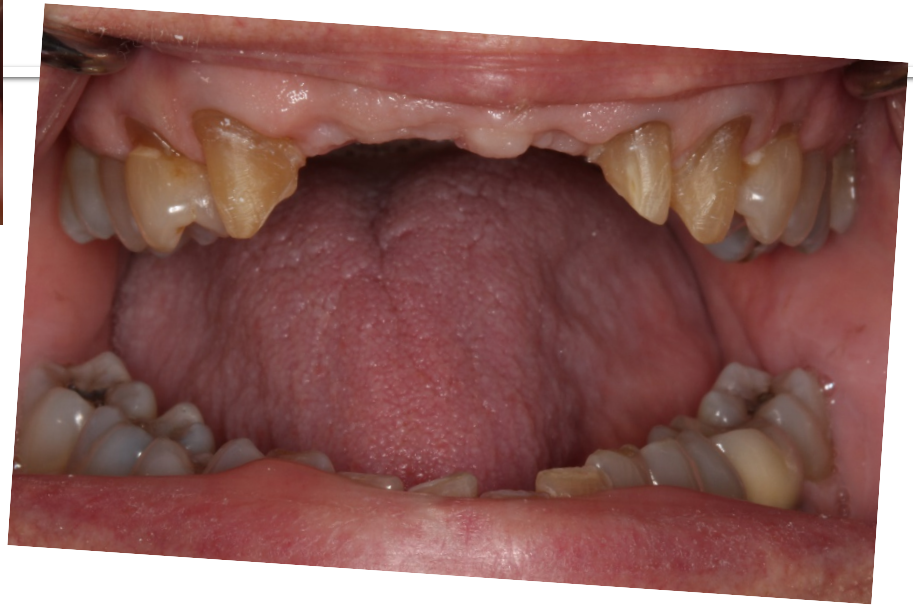

# Radiographic Findings

- Splint on maxillary teeth after injury
- Fractured #7 (noted with splint in place)
- Fractured #8
- #9 widened PDL





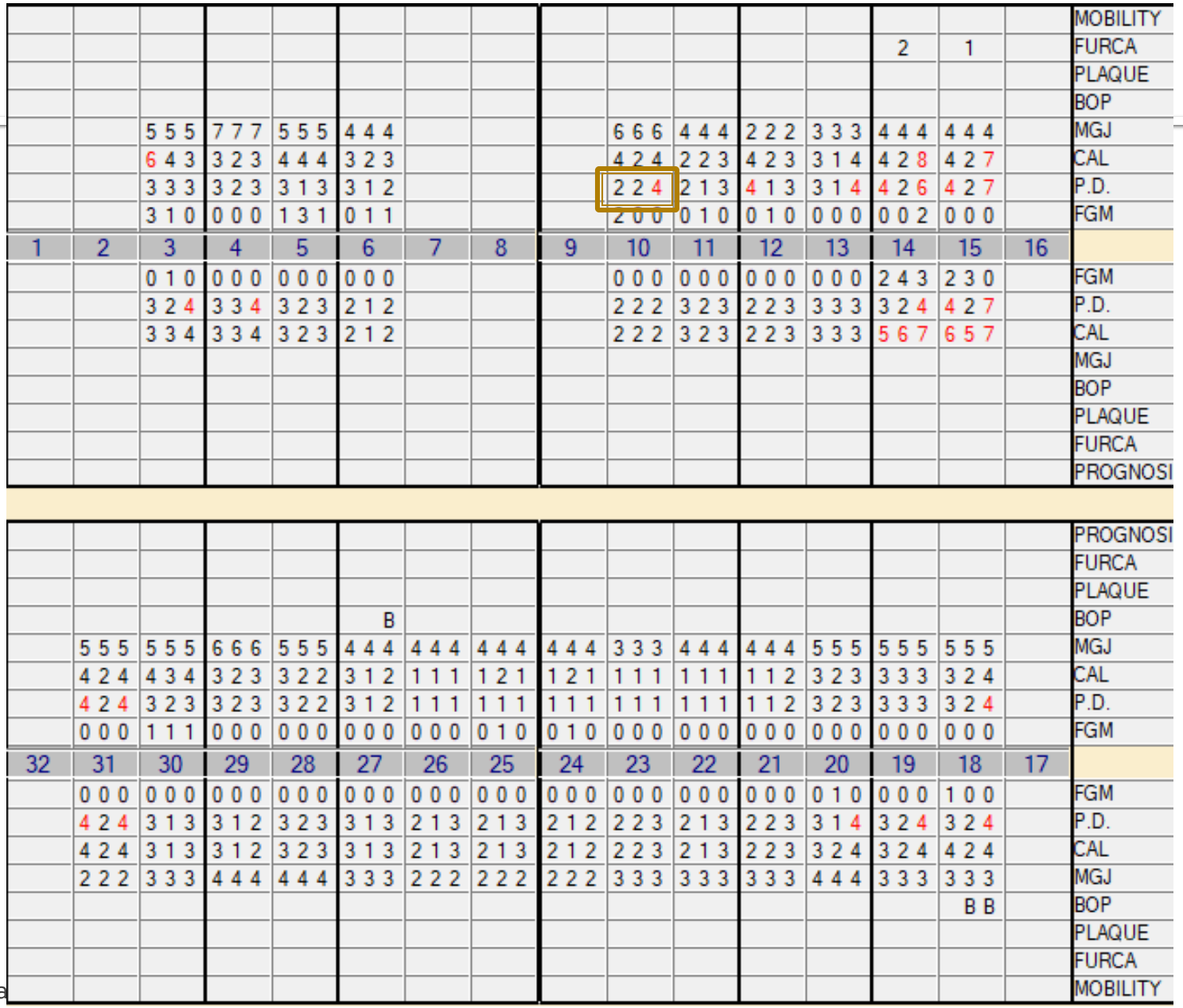




# Clinical Findings

- Localized periodontitis
- Fractured #7 and #8
- #9: necrotic pulp, symptomatic apical periodontitis
- #30 fracture line found on the distal
  - Need full coverage restoration

# Periodontal Charting



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| | | 6 4 3 | 3 2 3 | 4 4 4 | 3 2 3 | | | | 4 2 4 | 2 2 3 | 4 2 3 | 3 1 4 | 4 2 8 | 4 2 7 | | CAL |
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| | | | | | | | | | | | | | | | | FURCA |
| | | | | | | | | | | | | | | | | MOBILITY |

# Diagnosis

- #7: non-restorable due to fracture
- #8: non-restorable due to fracture
- #9: necrotic pulp with symptomatic apical periodontitis

# Problem List

- Missing teeth due to dental trauma
- Periodontal disease

# D1 Basic Science
# FPD Components

**Pontics:**

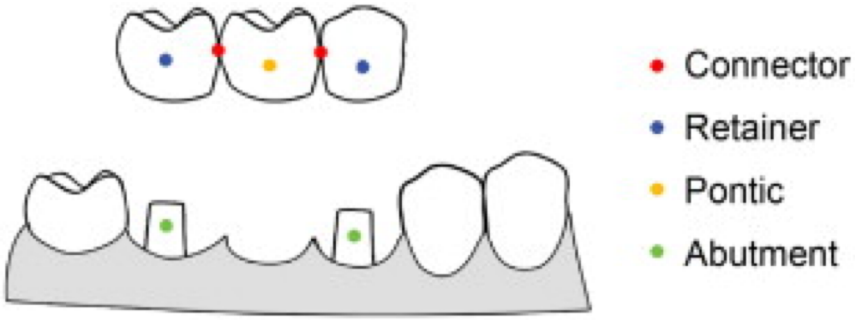
-Artificial tooth

-Restores function and esthetics

-Prevents tilting or drifting of adjacent teeth into edentulous space

Classifications:

1. Sanitary/Hygiene Pontic:
   a. Poor esthetics, best for hygiene
2. Saddle-ridge-lap Pontic:
   a. Esthetic, not amenable to hygiene
3. Conical Pontic:
   a. Poor esthetics, amenable hygiene
4. Modified-ridge-lap Pontic:
   a. Esthetic, somewhat amenable to hygiene
5. Ovate Pontic:
   a. Optimal esthetics, amenable to hygiene

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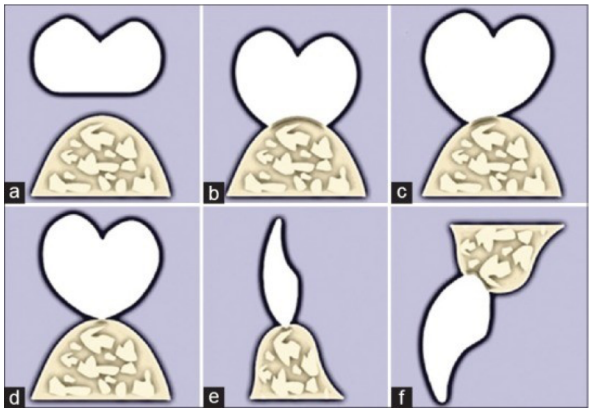



https://tinyurl.com/y2dhv95r

## 2. Connectors:

***Function***: Establishes union between pontics and retainer, as well as provides stress relief of prosthetic

Two types of Connectors:

1. **Rigid:** Locked connector
- Metal connector made by: Casting, Soldering , Welding
- Different advantages/disadvantages to each process

2. **Non Rigid:** Provides limited movement
- Dovetail
- Split-pontic
- Cross pin and wing
- Loop Connector

## 3. Retainer:

***Function***:

- Directly attaches to abutment in order to provide stability
- Connects abutment with bridge
- Prevents dislodgement of prosthetic

**Ante's Law:**

"The total periodontal membrane area of the abutment teeth must equal or exceed that of the teeth to be replaced" (Balevi)


Rosenstiel, S. F., Land, M. F., Fujimoto, J., & Baima, R. F. (2016). *Contemporary Fixed Prosthodontics*.

Zhao, J., & Wang, X. (2014). Dental Prostheses. *Advanced Ceramics for Dentistry,* 23-49. doi:10.1016/b978-0-12-394619-5.00003-1

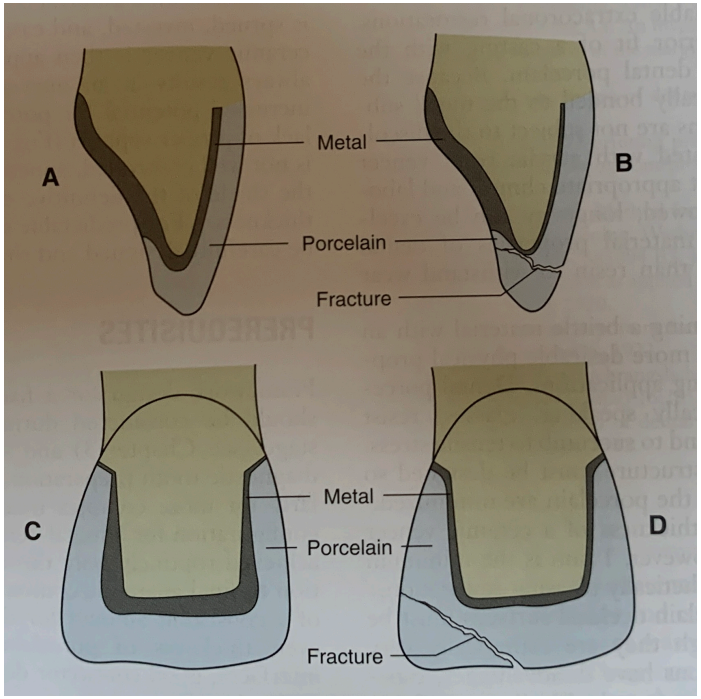
Balevi, B. (2012, September 1). Ante's law is not evidence based. Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/22942148

# D2 Pathology
# FPD Failure : Biological

## D2 Pathology Question:

What are some reasons why fixed partial dentures fail?

1. **Biological Complications**
   - **Secondary caries** – poor FPD design and oral hygiene
   - **Loss of vitality** – endodontic treatment needed
   - **Abutment tooth fracture** – lack of support
   - **Periodontal disease** – invasion of biologic width

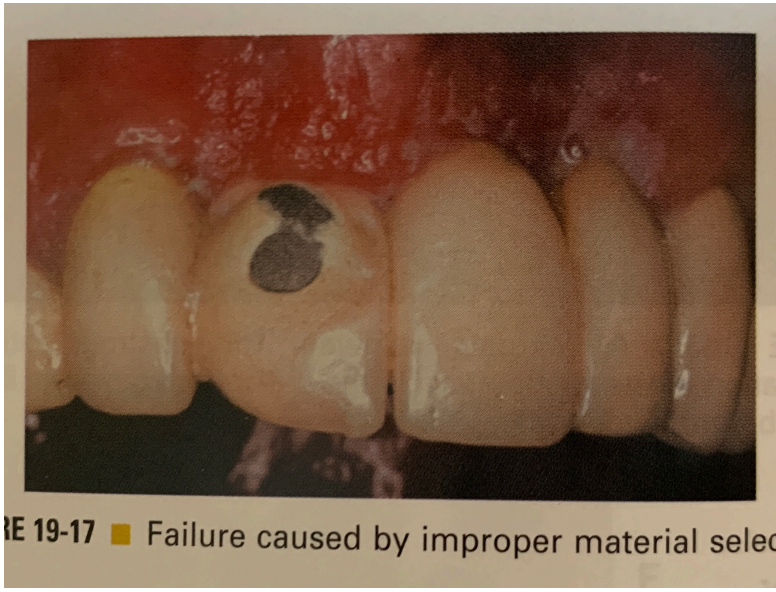



Rosenstiel, S. F., Land, M. F., & Fujimoto, J. (2006). *Contemporary fixed prosthodontics*. St. Louis, Mo: Mosby Elsevier.

# D2 Pathology
# FPD Failure : Technical

## 2. Technical Complications

- **Material** – framework fracture and ceramic chipping
  - Alloy and/or porcelain should be compatible
  - Dental porcelain susceptible to tensile strength
- **Loss of retention** – insufficient crown length
- **Marginal discoloration** – manufacturing technique
  - CAD/CAM reconstruction?




Rosenstiel, S. F., Land, M. F., & Fujimoto, J. (2006). *Contemporary fixed prosthodontics*. St. Louis, Mo: Mosby Elsevier.

# D3 PICO

- **Clinical Question:**

# PICO Format

**P:**

**I:**

**C:**

**O:**

# PICO Formatted Question

# Clinical Bottom Line

# Search Background

- **Date(s) of Search:**
- **Database(s) Used:**
- **Search Strategy/Keywords:**

# Search Background

- **MESH terms used:**

# Article 1 Citation, Introduction

- Citation: Authors, Title, Journal, Date, Volume, Page Numbers.
- Study Design:
- Study Need / Purpose:

# Article 1 Synopsis

- 1-2 slides
- Method
- Results
- Conclusions
- Limitations

# Article 1 Selection

- 1 slide
- Reason for selection
- Applicability to your patient
- Implications

# Article 2 Citation, Introduction

- Citation: Authors, Title, Journal, Date, Volume, Page Numbers.
- Study Design:
- Study Need / Purpose:

# Article 2 Synopsis

- 1-2 slides
- Method
- Results
- Conclusions
- Limitations

# Article 2 Selection

- 1 slide
- Reason for selection
- Applicability to your patient
- Implications

# 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

# 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

# Conclusions: D3

How does the evidence apply to this patient?

- Consider/weigh:
  - Literature
  - Group Leader & Specialist experience
  - Patient circumstances & preferences

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

# Conclusions: D4

Based on your D3's bottom line recommendations, how will you ***advise*** your patient?

- I will advise my patient to select a porcelain fused to metal FPD

How will you ***help*** your patient?

- I will help my patient by preparing the teeth well and educating her to allow for success of her restoration

# Questions??

# THANK YOU