Group 6B-5 Presentation

Evidence Based Dentistry Rounds
Specialty- Special Needs

Group 6B-5

Wednesday 10/21/2020

Rounds Team

- **Group Leader:** Dr. Cimermancic
- **Specialty Leader:** Dr. Hoffman
- **Project Team Leader:** Shannon Taylor D3
- **Project Team Participants:**
  - Joey Brostowitz D2
  - Eleanor Meyer D1
  - Kevin Nitz D1

Patient

- **Age**: 58 years old
- **Gender**: Female
- **Ethnicity**: African American
- **Chief Complaint per caretaker**: “Problem with the front tooth”

Medical History

- <u>Diagnoses, Conditions, Medications:</u>
  - **Allergies :** General Seasonal
    - Cetirizine 10mg QD
    - Benadryl Allergy 25mg PRN
    - Montelukast 10mg 1 tab every night
  - **Heart Disease**: Hypertension
    - Atenolol 100mg qAM
    - Amlodipine 10mg
    - Hydrochlorothiazide 25mg qAM
  - **Respiratory**: Sleep apnea
    - Uses CPAP machine
  - **Orthopedic**: Bilateral knee replacement 2017
    - Premedication – amoxicillin 500mg 1 hour before each dental appt.
  - **Vitamin Deficiency:** Potassium
    - Potassium chloride 10mg AD
  - **Neurologic**: Psychiatric disease/mental health disorder
    - No formal diagnosis
    - Not able to communicate or identify pain
      - She didn't complain about knees being bone-on-bone b4 replacement but gets bothered by small things such as mosquito bites
    - Medications
      - Olanzapine 10mg qPM, antipsychotic
      - Ziprasidone HCL 40mg 1 tab 2x per day before meals, sensory/behavior management

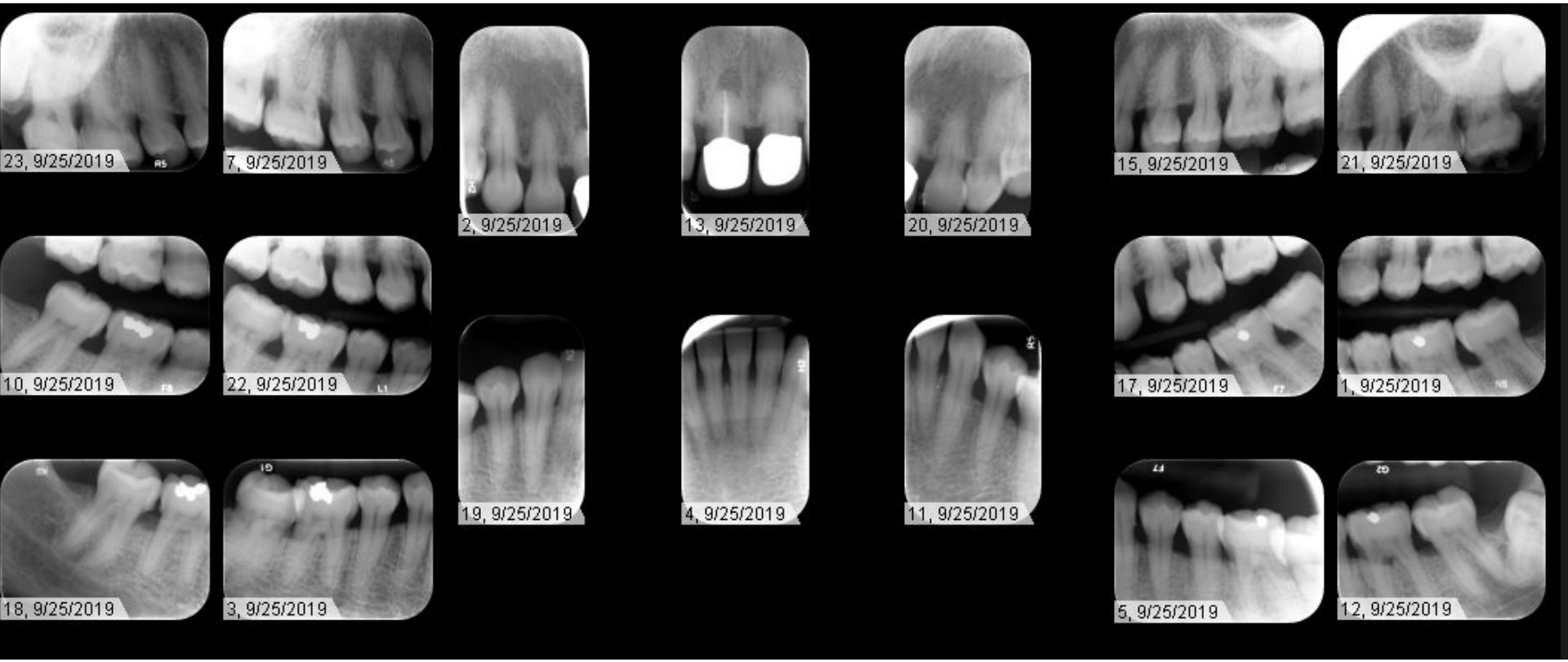
Dental History

- **Chief Complaint**
  - Pt's caretaker indicated pt was pushed off a bus ~30 yr ago, injuring her front teeth. Pt was told by previous dentist that she would need to extract #8 but pt and caretaker decided to come to MUSOD to see if eligible for RCT instead

- **Oral Hygiene**
  - Brushes once a day and flosses sometimes w/ bleeding sometimes

- **Disability**
  - Intellectual disability for the past 57 years
  - Cognitive and communication disabilities affect function
    - Developmental disability and speech impediment
    - Requires help to communicate her needs
    - Needs assistance to understand more complex ideas/instructions
    - Has a caretaker

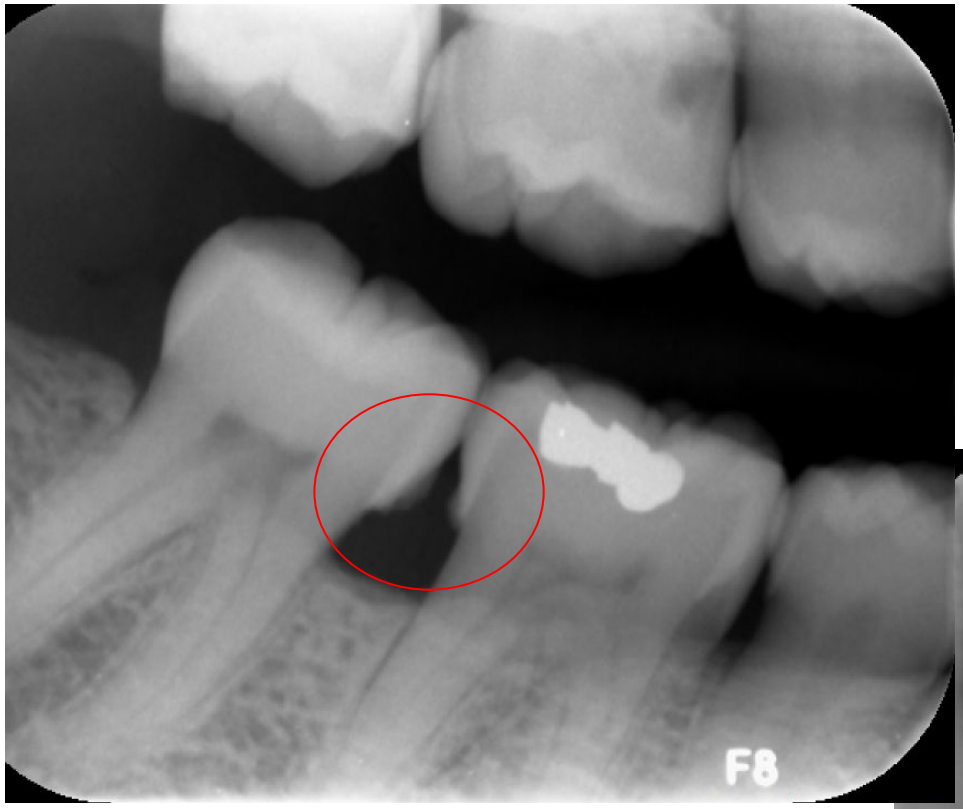
Radiographs - FMX taken 9/2019

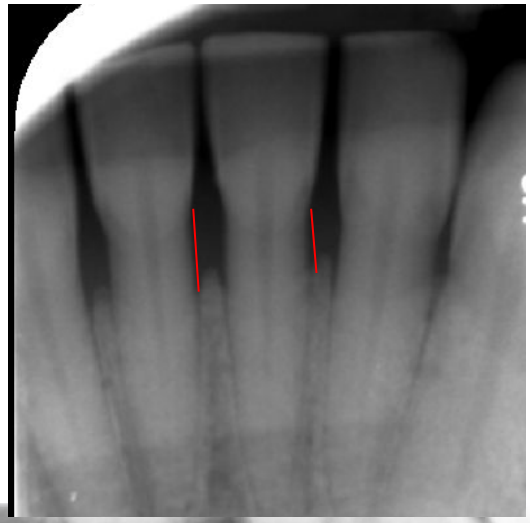


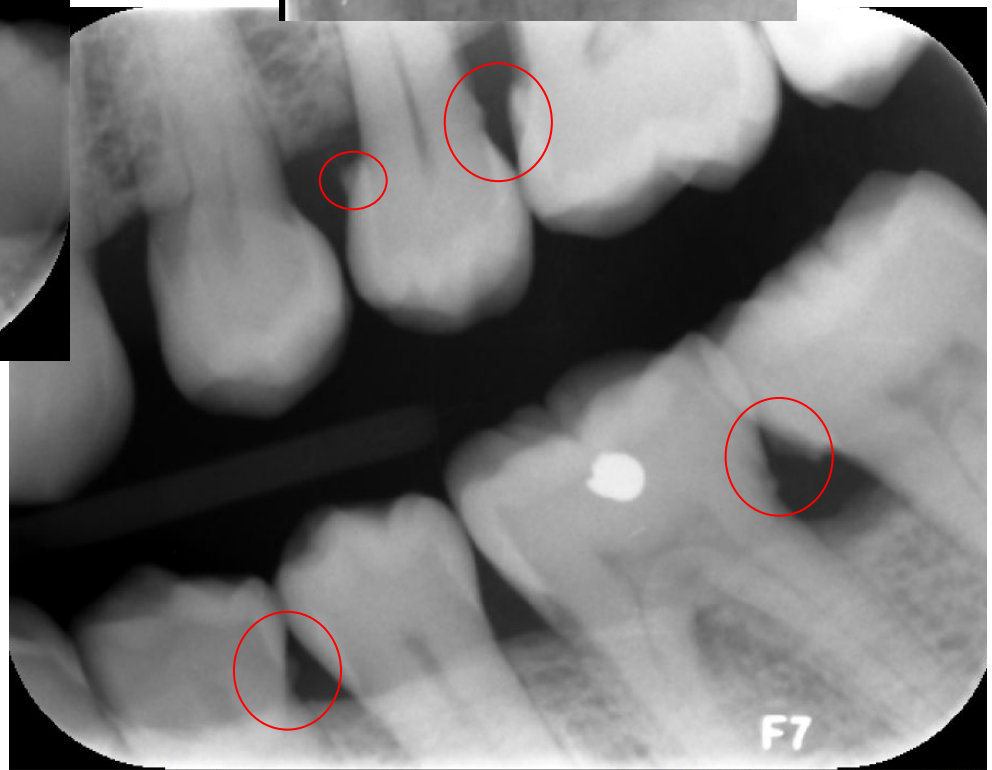
Radiographs - Endodontic Findings

- #8
  - Previously Treated
  - PARL and resorption

Radiographs - Periodontal Findings

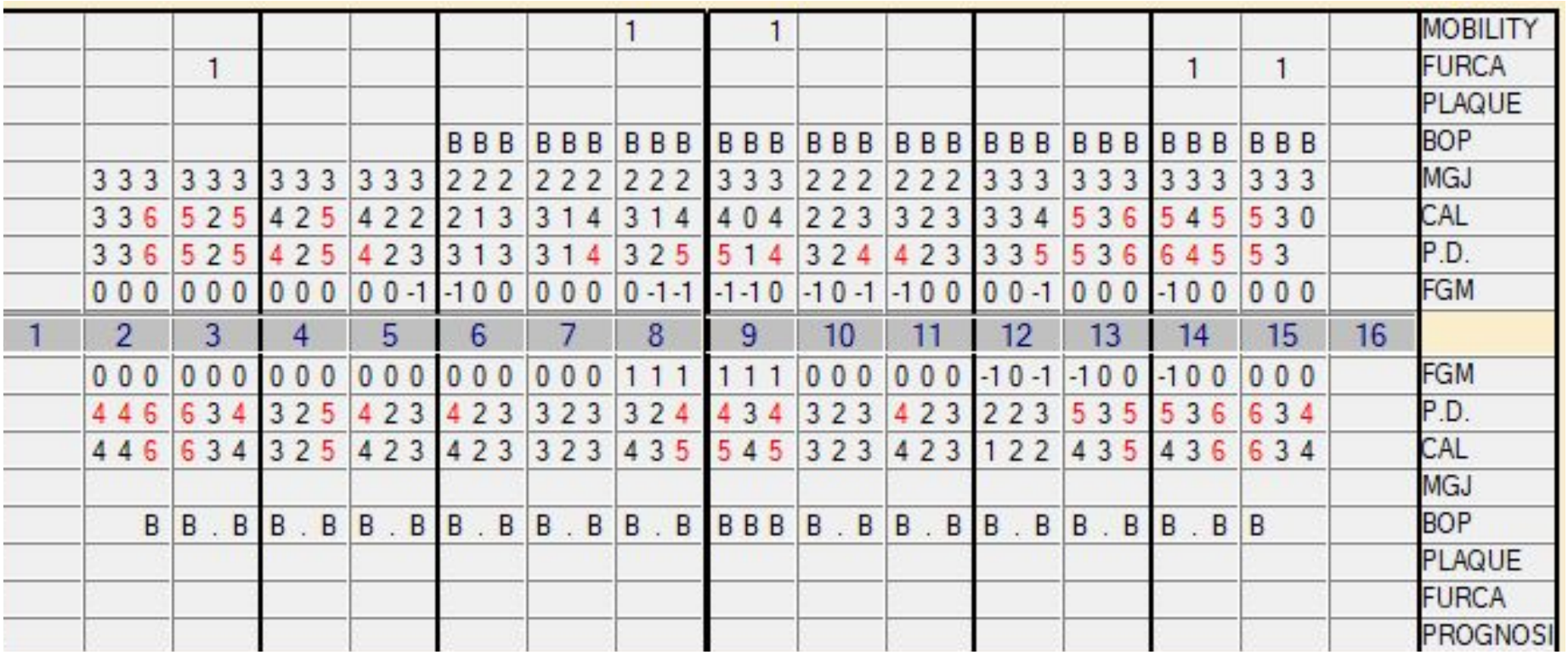






- Generalized Calculus
  - specifically #13, 14, 18, 19, 21
- Generalized Bone Loss
  - 2-4mm from CEJ generalized

Periodontal Charting - Maxillary



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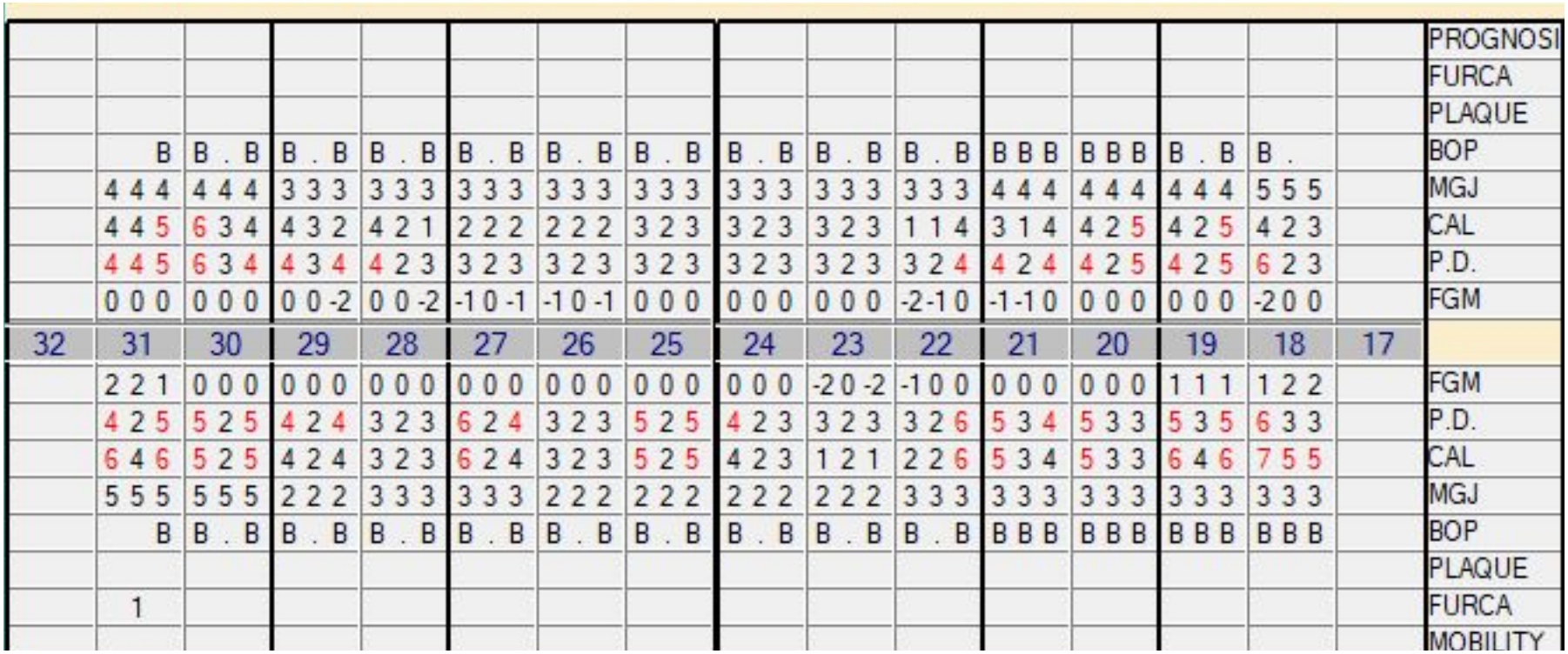
- Significant Clinical Attachment Loss, generalized
  - Deepest Pockets per section = 5-7mm in all quadrants
- Generalized Bleeding on Probing
- Furcation Involvement

Periodontal Charting - Mandibular



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- Significant Clinical Attachment Loss, generalized
  - Deepest Pockets per section = 5-7mm in all quadrants
- Generalized Bleeding on Probing
- Furcation Involvement

Clinical Findings

- **Comprehensive Exam**
  - Buttressing bone apparent from clenching at night causing slow progressive bone loss
  - Medication induced gingivitis (amlodipine and olanzaopine)
- **Periodontal Exam**
  - Oral Hygiene Status (40 form)
    - Heavy plaque, sub/supra calculus, and moderate staining
  - Gingival Description (50 form)
    - Marginal Shape = Enlarged and Rolled
    - Color = Red and pigmented (ethnic)
    - Attached Zone = inadequate
    - Papillary Shape = bulbous (posteriors) and blunted (anteriors)
    - Consistency = spongy (generalized)

Problem List

- Pain
- Caries
- Perio Disease
- Periapical Radiolucency
- Home Care

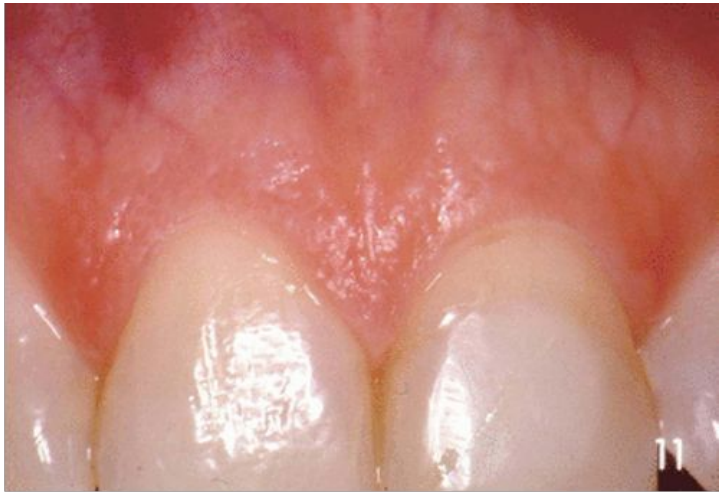
Diagnosis and Treatment Plan

- **Periodontal**
  - Diagnosis
    - Chronic Periodontitis , generalized <30%
  - Treatment Plan
    - SRP UR, UL, LL, LR
    - Perio re-eval 4 to 6 weeks post last SRP

- **Endodontics**
  - Diagnosis
    - Asymptomatic Apical Periodontitis
  - Treatment Plan
    - RCT retreatment for #8 due to lack of ability to communicate pain and the obvious radiographic presentation of apical resorption
    - Prognosis guarded

D1 - What is periodontal disease?

- Diseases that impact the gingiva and supporting structures of the gingiva
- Healthy gingiva -
  - pale pink/coral color
  - knife-edged FGM
  - pointed interdental papillae
  - 1-3 mm probe depth, no BOP



Highfield, J. 2009. Diagnosis and classification of periodontal disease. Australian Dental Journal. 54: S11-S26.

Pihlstrom, B.L., Michalowicz, B.S., and Johnson, N.W. 2005. Periodontal diseases. The Lancet. 366: 1809-1820.

Plaque-induced periodontal diseases

Gingivitis

- 10-20 days without any oral hygiene procedure will allow plaque biofilms to reach subgingivally and begin breaking down host tissues
- Immune response kicks in
- Results in inflammation, BOP, redness, increased gingival crevicular fluid - reversible

Periodontitis

- Plaque extends to and damages PDL and alveolar bone, large periodontal pockets
- Shift to motile, anaerobic, gram negative bacteria
- Irreversible damage

Highfield, J. 2009. Diagnosis and classification of periodontal disease. Australian Dental Journal. 54: S11-S26.

ALT D1 Basic Science:
What are the different types of anesthesia that can be used in the dental setting?

- Local anesthesia
  - Injected or place topically
  - Reduced sensation and pain in the area applied

- Sedation methods can be implemented when treating patients with a complex history

- Minimal sedation
  - Patient can maintain their own airway
  - Capable of responding to touch and communication, with imparied cognition and coordination
  - Produced by <50% nitrous oxide or oral sedative normally prescribed for insomnia or anxiety

ADA House of Delegates. "Guidelines for the Use of Sedation and General Anesthesia by Dentists." *ADA*, 2007, www.ada.org/~/media/ADA/Member%20Center/Files/anesthesia_guidelines.ashx.

ADA House of Delegates. "Guidelines for the Use of Sedation and General Anesthesia by Dentists." *ADA*, 2016, http://www.ada.org/~/media/ADA/Education%20and%20Careers/Files/anesthesia_use_guidelines.pdf

An Updated Report by the American Society of Anesthesiologists Task Force on Sedation and Analgesia by Non-Anesthesiologists; Practice Guidelines for Sedation and Analgesia by Non-Anesthesiologists. Anesthesiology 2002; 96:1004–1017 doi: https://doi.org/10.1097/00000542-200204000-00031

ALT D1 Basic Science:
What are the different types of anesthesia that can be used in the dental setting?

- Moderate Sedation
  - Patient can maintain their own airway
  - Capable of responding to communication if another stimulus like touch is present
- Deep Sedation
  - Patient may not be able to maintain their airway
  - Patient will not respond unless there is a painful stimulus
- General Anesthesia
  - Patient is no longer conscious and becomes unarousable
  - May not be able to maintain airway and cardiovascular function may become altered

ADA House of Delegates. "Guidelines for the Use of Sedation and General Anesthesia by Dentists." *ADA*, 2007, www.ada.org/~/media/ADA/Member%20Center/Files/anesthesia_guidelines.ashx.

ADA House of Delegates. "Guidelines for the Use of Sedation and General Anesthesia by Dentists." *ADA*, 2016, http://www.ada.org/~/media/ADA/Education%20and%20Careers/Files/anesthesia_use_guidelines.pdf

An Updated Report by the American Society of Anesthesiologists Task Force on Sedation and Analgesia by Non-Anesthesiologists; Practice Guidelines for Sedation and Analgesia by Non-Anesthesiologists. Anesthesiology 2002; 96:1004–1017 doi: https://doi.org/10.1097/00000542-200204000-00031

D2 Pathology:
What is scaling and root planing and when is it indicated?

Scaling and Root Planing - *The Gold Standard*

D4341- "instrumentation of the crown and root surfaces of the teeth to remove plaque and calculus from these surfaces. It is indicated for patients with periodontal disease and is therapeutic, not prophylactic, in nature." – ADA

Indications

"Chronic Periodontitis"

Clinical loss of periodontal attachment and/or

Radiographic evidence of crestal bone loss or changes in crestal lamina dura and/or

Radiographic evidence of root surface calculus

Limitations

The Body

The Clinician

Lang NP. Indications and rationale for non-surgical periodontal therapy. Int Dent J. 1983 Jun;33(2):127-36. PMID: 6347903.
Zappa, U., et al. "Root substance removal by scaling and root planing." *Journal of Periodontology* 62.12 (1991): 750-754

The "Central Element"
In Periodontal Disease Control

Mechanically removes bacteria and disrupts ecology of the biofilm

Removes plaque, calculus, and endotoxin infected cementum
To a biologically acceptable level
Reduces inflammation

Reduces/maintains pocket depth

Increases/ maintains clinical attachment levels

Pretreatment for other periodontal surgery

Definitive treatment for chronic periodontist via non-surgical periodontal therapy

Smiley, Christopher J., et al. "Systematic review and meta-analysis on the nonsurgical treatment of chronic periodontitis by means of scaling and root planing with or without adjuncts." *The Journal of the American Dental Association* 146.7 (2015): 508-524.

Dental Scaling and Root Planing for Periodontal Health: A Review of the Clinical Effectiveness, Cost-effectiveness, and Guidelines [Internet]. Ottawa (ON): Canadian Agency for Drugs and Technologies in Health; 2016 Oct 17. PMID: 27929624.

D3 PICO

- **Clinical Question:**
  - What are the recommended treatment strategies for patients with intellectual disabilities during dental procedures?

PICO Format

P: Patients with intellectual disabilities

I: Pharmacological behavior management strategies for outpatient dental procedures

C: Non pharmacological behavior management strategies

O: Maximize comfort and cooperation with this population of patients

PICO Formatted Question

- When performing outpatient dental procedures on patients with intellectual disabilities, is using pharmacological versus non pharmacological strategies more beneficial to maximize their comfort and cooperation?

Clinical Bottom Line

- This patient is unable to process complex thought and has difficulty expressing pain level. She came to MUSOD to have endodontic work done and also had significant calculus buildup even after one session of SRP was done. This evidence will help improve patients comfort with these longer and more invasive procedures.

Search Background

- **Date(s) of Search:**
  - Wednesday 9/30/2020
  - Tuesday 10/13/2020
- **Database(s) Used:**
  - PubMed
  - Cochrane Library
  - Google Scholar
- **Search Strategy/Keywords:**
  - Behavior management
  - Treatment strategies
  - Special needs
  - Dental procedures
  - Outpatient
  - Sedation

Search Background

- **MESH terms used:**
  - Anesthesia, General
  - Intellectual Disability
  - Dental Care
  - Evidence-Based Dentistry
  - Conscious Sedation

Article 1
“Changes in the Oral Health-Related Quality of Life in Adult Patients with Intellectual Disabilities after Dental Treatment under General Anesthesia”

- Citation:
  - Hillebrecht, Anna-Lena, et al. “Changes in the Oral Health-Related Quality of Life in Adult Patients with Intellectual Disabilities after Dental Treatment under General Anesthesia.” Clinical Oral Investigations, vol. 23, no. 10, 2019, pp. 3895–3903., doi:10.1007/s00784-019-02820-4.
- Study Design:
  - Prospective single-center study
- Study Need / Purpose:
  - Assess changes in the oral health related quality of life (OHRQoL) in adult patients with intellectual disabilities after dental treatment under general anesthesia

Article 1 Synopsis

- Method
  - 52 adult patients with intellectual disabilities and their caregivers were given modified surveys preoperatively, 2 to 3 weeks, and then 12 weeks postoperatively
  - Statistical Analyses were performed on summary scores, demographics, oral health and treatment factors
    - non-parametric mixed effects models and spearman correlation ($p < 0.05$).
    - univariate and multivariate ordinal logistic regressions ($p < 0.05$).
- Results/Conclusions
  - Self and proxy results showed significant improvement of OHRQoL after dental treatment in general anesthesia ($p < 0.001$, $rSp = 0.43$).
    - OHRQoL at baseline was affected by cognitive impairment for caregivers and periodontal status for the patients
    - Improvement of OHRQoL based on extent of dental treatment for patient and experience for the caregiver
- Limitations
  - Not a randomized control trial
  - Generalizability was limited due to small sample size and single institution

Article 1 Selection

- Reason for selection
  - Speaks to the positive outcomes for patients with intellectual disabilities and their caregivers when under a pharmacological intervention for dental treatments
- Applicability to your patient
  - Endo treatment and SRP are two longer more invasive dental treatments
  - This patient is unable to communicate her pain level so general anesthesia could improve her level of comfort during the procedure and her caregiver post operatively
- Implications
  - Practicing dentists should consider either providing or referring patients to outlets that can provide this service for patients with intellectual disabilities that struggle with communication

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
“Sedation with 50% Nitrous Oxide/Oxygen for Outpatient Dental Treatment in Intellectual Disability”

- Citation
  - Faulks, Denise, et al. “Sedation with 50% Nitrous Oxide/Oxygen for Outpatient Dental Treatment in Individuals with Intellectual Disability.” Developmental Medicine & Child Neurology, vol. 49, no. 8, 2007, pp. 621–625., doi:10.1111/j.1469- 8749.2007.00621.x.
- Study Design:
  - Longitudinal, prospective, multicenter trial
- Study Need / Purpose:
  - Investigate the effectiveness, tolerability, and behavioral impact of sedation for invasive outpatient care under local anesthesia in persons with intellectual disabilities using inhalation of a fixed 50%N2O/O2 mixture as a single agent

Article 2 Synopsis

- Method
  - Patients with an intellectual disability who previously were unable to cooperate with traditional dental treatment were referred to this 1 year long study
  - Given premix 50%N2O/O2 and 4% articaine for each dental procedure by trained non-anaesthetists
  - Recorded variable included
    - patient demographics
    - behavioural impact of sedation
      - a score was documented at 4 key points throughout appointment and placed on the Venham scale to describe the behavior and tested for significance using signed-rank test
    - capacity to perform the dental procedure (success vs. failure)
      - intergroup comparisons were made for success rate
    - tolerance to the drug
      - percentage of adverse events using Fisher's exact test

Article 2 Synopsis

- Results
  - 349 patients and 605 treatment/sedation sessions
    - 24.1% had undiagnosed intellectual disability
      - 97.9% had successful dental appointments within this group
  - Behaviour improved significantly from the start of the appointment to the end ($P<0.001$)
  - No major adverse events were encountered and only 10% of sessions showed minor adverse effects
- Conclusions
  - Demonstrates effectiveness, tolerance, and positive behavioral impact of inhalation sedation by non-anaesthetists using a premix of 50% N_2O/O_2 as single agent in outpatient treatment of persons with intellectual disability
- Limitations
  - lack of randomized control group
    - placebo group would not have been ethically acceptable in this context

Article 2 Selection

- Reason for selection
  - Supports the use of a pharmacological agent for patients with intellectual disability that may not require a more aggressive form of anesthesia such as general anesthesia
- Applicability to your patient
  - Although this patient is unable to communicate her pain tolerance, she overall has a good demeanor
  - The patient and her caretaker may opt in for conscious sedation option
- Implications
  - This form of sedation is safe for trained non-anaesthetists to use
  - More readily available option to use in the traditional dental practice

Levels of Evidence

- ☐ **1a** – Clinical Practice Guideline, Meta-Analysis, Systematic Review of Randomized Control Trials (RCTs)
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- ☐ **8** – In Vitro Research

Article 3
“Practical oral care for people with intellectual disability.”

- Citation:
  - National Institutes of Health. “Practical oral care for people with intellectual disability.” Today's FDA : official monthly journal of the Florida Dental Association vol. 22,1 (2010): 53-5, 57, 59.
- Study Design:
  - One of a series of booklets on providing oral care for people with mild or moderate developmental disabilities
- Study Need / Purpose:
  - highlights recommendations and approaches to improve outcomes for patients who have mild to moderate forms of this disability

Article 3 Synopsis

- Recommendations for Patients with Mental Challenges
  - Address your patient directly
  - Ask the caregiver to elaborate on the patient's abilities
  - Use simple concrete instructions delivered slowly and repetitively
  - Be consistent in all aspects of oral care since long term memory is usually unaffected
  - Listen actively since communicating is difficult and show your patient you understand
- Recommendations for Patients with Behavioral Challenges
  - Schedule patients early in the day
  - Reward cooperative behavior
  - Consider sedative techniques to diminish anxiety
- Many of these patients will indicate periodontal disease
  - Teach the caregiver how to brush the patients teeth
  - Emphasize routine by performing oral hygiene in the same location, time, and position

Article 3 Selection

- Reason for selection
  - Supports the use of a non pharmacological approach for patients with intellectual disability and highlights the successful strategies
- Applicability to your patient
  - This patient has a mild/moderate form of intellectual disability and this booklet focuses on treating patients with these mental challenges with specific recommendations on periodontal disease
  - Additionally it has information that can help the patient's caretaker with at home oral hygiene
- Implications
  - Knowing the successful techniques to communication before, during, and after treatment are vital to improving the patient's treatment outcomes and longevity of oral health

Levels of Evidence

- ☐ **1a** – Clinical Practice Guideline, Meta-Analysis, Systematic Review of Randomized Control Trials (RCTs)
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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

Conclusions: D3/D4

How does the evidence apply to this patient?

- Although the evidence and research are lacking, this patient should consider
  - Pharmacological intervention for endo and SRP procedures
    - Difficulty communicating pain and this will enhance her comfort during treatment
    - Conscious sedation might be the more appropriate choice
  - Non pharmacological methods are key to the long-term preventative oral health for this patient and her caretakers for diminishing calculus and periodontal disease

Based on the above considerations, how will you advise and help your patient?

- Address your patient directly and use simple concrete instructions
- Listen actively since communicating is difficult and show your patient you understand
- Advise the use of nitrous oxide sedation sedation with patient and caretaker
- Teach the caregiver how to brush the patients teeth
  - Emphasize routine by performing oral hygiene in the same location, time, and position

Discussion Questions

- Are certain dental procedures contraindicated for patients with intellectual disabilities?
- Does the caries risk increase for individuals who are diagnosed with intellectual disabilities and how can this trend be combated?
- What behavior management techniques in patients with intellectual disabilities have proven to be effective?
- What are successful methods of teaching patients with intellectual disabilities proper oral hygeine habits?
- Are there current outreach programs that provide information regarding dental care for individuals with intellectual disabilities?
- Are there certain pharmaceuticals that individuals with intellectual disabilities take that have a negative impact on oral health?
- What are some contraindications of utilizing general anesthesia in intellectually disabled patients?

Discussion Questions

- Are there programs that can accept referrals for patients with intellectual difficulties if the dental practitioner is unable to provide sufficient dental care on their end due to the difficulty of treating the patient?
- What can dental schools do to better prepare their students for treating patients with intellectual disabilities?
- Is the occurrence of periodontal disease higher in patients with diagnosed intellectual disabilities?
- what kind of specialty training needed to treat intellectual disability patients?
- How can you effectively communicate with the intellectually challenged patients who is not able to provide informed consent?
- When treating patients with intellectual disabilities, what are some of the routine practices we as general dentists should be able to provide without specialist consult?
- What is the best method of patient management and treatment explanation to a patient with an intellectual disability?
- How might the assistance of a caregiver play a role in the treatment planning process and overall management of patients with intellectual disabilities?

THANK YOU