Evidence Based Dentistry Rounds Presents:

GERIATRIC DENTISTRY

Group 3B-1

Nov 11th,2020

Rounds Team

- **Group Leader: Dr. Grady**
- **Specialty Leader: Dr. Hjertstedt**
- **Project Team Leader: Andrea Giraldo**
- **Project Team Participants:**
  - **D1:Sean Luangpraseuth**
  - **D2:Dustin Dengel**
  - **D3: Jack Peters**

Patient

- Age: 75 year old
- Female
- Caucasian

CHIEF COMPLAINT

- "My gums are sensitive and receded and I'd like to get them fixed"

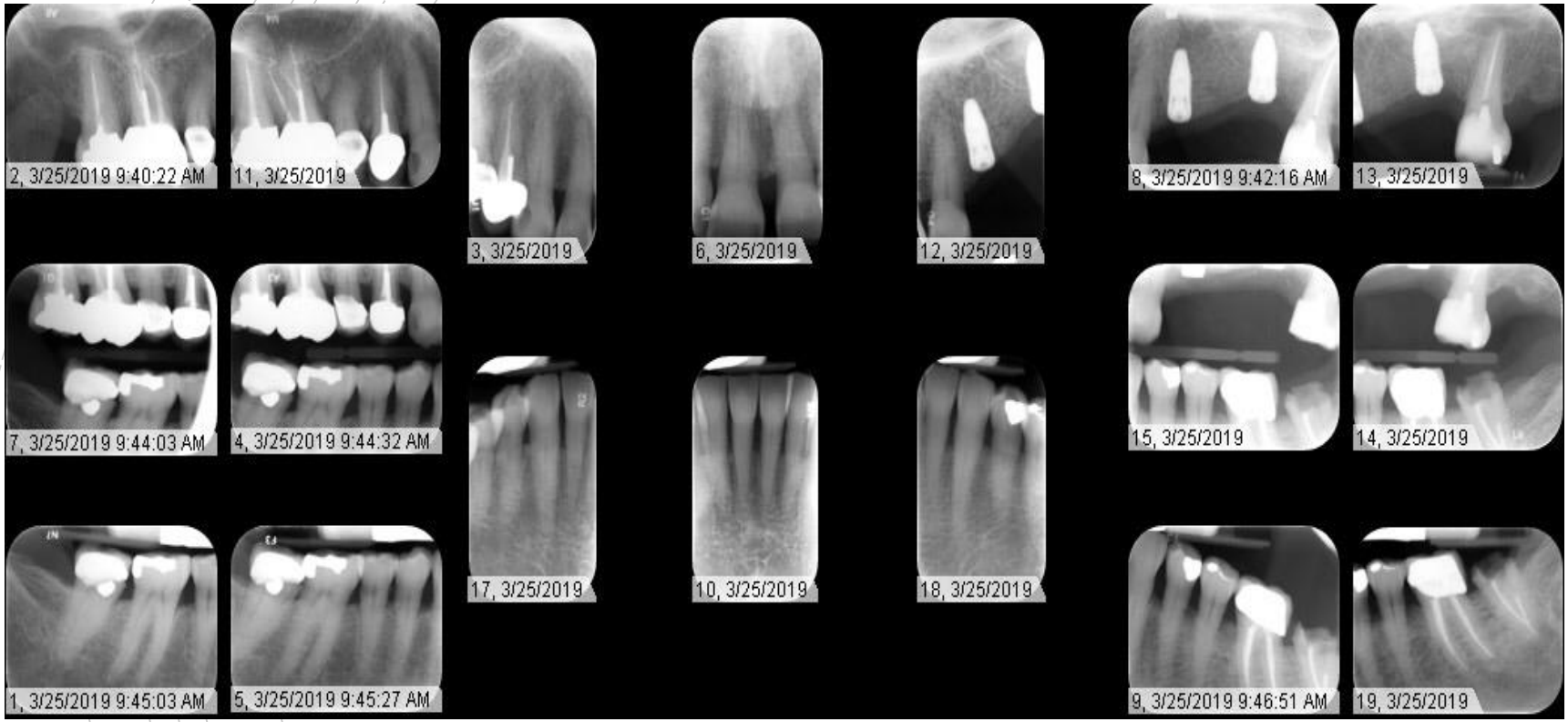
Medical History

- Acid reflux, anxiety, high cholesterol, irritable bowel syndrome
- Current medications:
  - Zinc amino acid chelate (50mg)
  - Simvastatin (40mg)
  - Omeprazole magnesium (20mg)
  - Lorazepam (1mg)
  - Citalopram (40 mg)
  - Dicyclomine (10mg)
  - Calcium with Vitamin D3 (500mg)

  - **Allergies:** Sulfa drugs

Dental History

- Pt has a history of caries, RCTs, tooth loss, crowns and implants.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Radiographs

- Missing teeth: #1,#12,#13,#14, #15,#16,#17,#32.
- Remaining root tip on #18
- Implants placed at sites #12 and #14
- Root canal treatments on tooth #2,#3,#5,#18 and #19
- Crowns: #3,#4,#5,#19,#31
- MO amalgam #2, #6 D resin,#20 O amalgam, #21 DO amalgam,#29 O resin, #20 DO amalgam, #31 B amalgam.

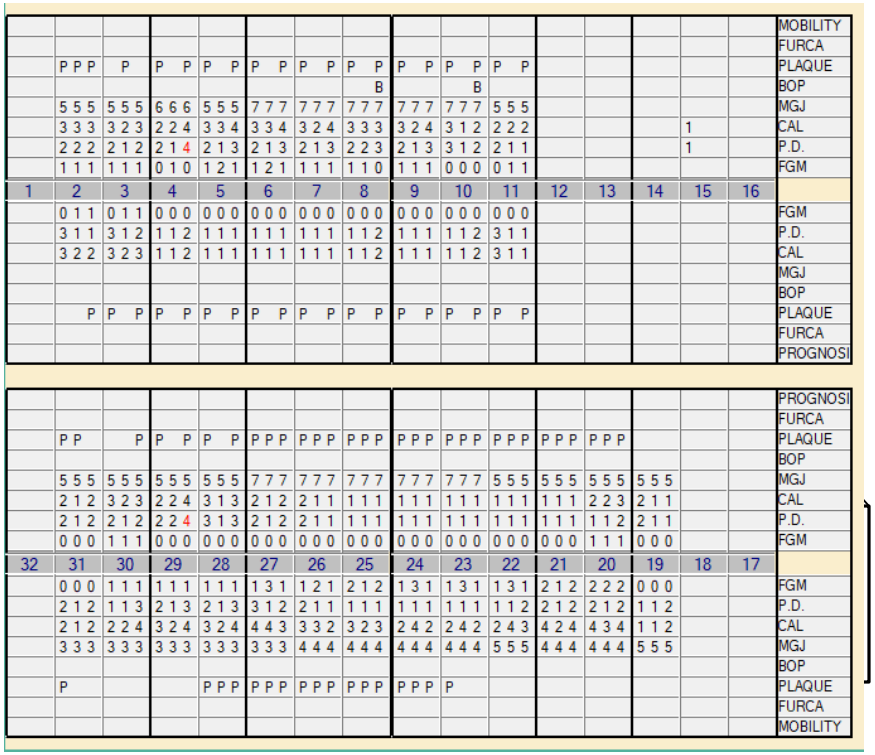
Clinical Findings

- Clinical attachment loss in mandibular posterior teeth.
- Gingival recession:#4, #5,#20-22,#28-29
- Tooth abfraction/abrasion present in upper right PM area, maxillary anteriors and right and left mandibular posterior teeth.
- Cervical caries on #28,#29.

Specific Findings

- Cervical abfraction/abrasion in UR, anterior maxilla and lower posterior teeth.
- Tooth wear

Periodontal Charting



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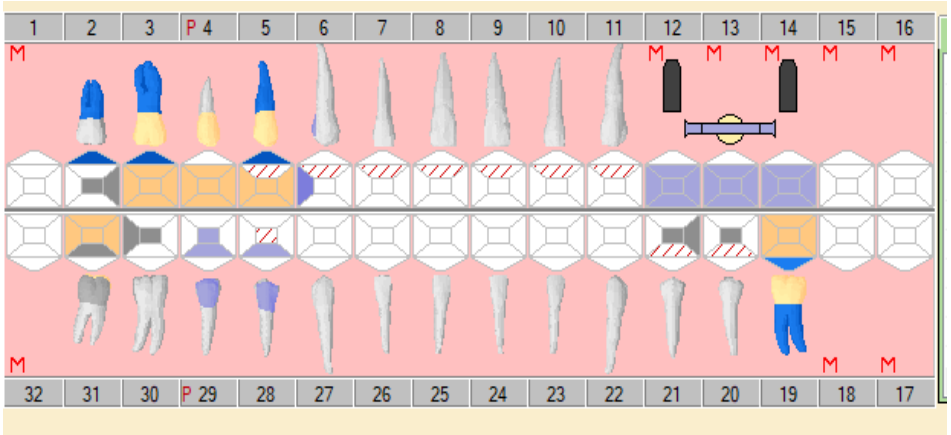
Odontogram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Diagnosis

- Non-carious cervical abfraction/abrasion

Problem List

- Missing teeth
- Cervical abfractions
- Cervical sensitivity
- Caries
- Poor OHI

D1 Basic Science What are some age-related changes in teeth?

- **Enamel:**
  - Enamel becomes more brittle with age increasing susceptibility to mechanical forces
- **Dentin:**
  - Continued growth including physiological secondary dentin formation
  - Gradual obturation of dentinal tubules (dentin sclerosis)
- **Cementum:**
  - Thickening of cementum with reduced rate of rate formation
  - Organic content reduces resistance to environmental agents (e.g sugars, acids and tobacco)
- **Pulp: overall reduction in pulpal volume**
  - Increase in fiber content while decrease in cellular content
  - Decrease in blood supply in the subodontogenic region
  - Pulp calcifications present as well as narrowing of root canal
  - Implications; decrease in reparative properties and sensitivity to stimuli (e.g decay or trauma)

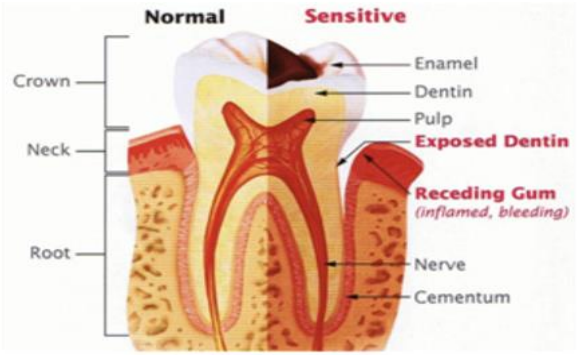
What are some age-related changes in teeth?

- **Salivary Glands:**
  - Decreased in function with age
  - Implications: reduction in various functions of saliva such as antimicrobial characteristics and forming a protective barrier
- **Oral Mucosa:**
  - Normally, mucosa serves a protective function against microorganisms and various types of abrasion
  - With age, oral mucosa degenerates
  - Implications: increased susceptibility to pathogens, abrasion, and chemical wear

Gonsalves, W. C., Wrightson, A. S., & Henry, R. G. (2008). Common oral conditions in older persons. *American family physician*, *78*(7), 845–852.

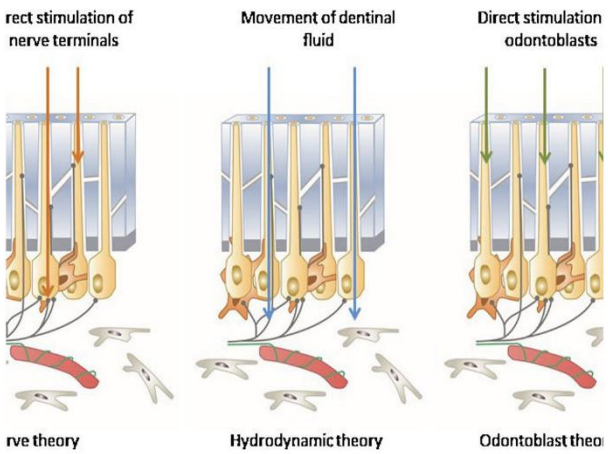
P Abdul Razak, K M Jose Richard, Rekha P Thankachan, K A Abdul Hafiz, K Nanda Kumar, K M Sameer J Int Oral Health. 2014 Nov-Dec; 6(6): 110–116.

D2 Pathology What is dentin hypersensitivity?



- Sharp pain, short in duration
- Comes and goes with presence of stimuli:
  - Hot/cold
  - Sweet
  - Tactile
  - Electrical
- Due to exposed dentin through loss of cementum/enamel:
  - Acidic food/beverages
  - Poor OHI
  - Aggressive brushing
  - Recession

3 different theories of dentin hypersensitivity



- Direct innervation theory:
  - Nerves from pulp extend to the dentinoenamel junction
  - Studies have proven this to be false
- Transduction theory:
  - Odontoblastic process acts as a receptor
  - Processes transmit pain from dentin to peripheral pulp
- Hydrodynamic hypothesis:
  - Stimuli cause fluid to flow through dentinal tubules
  - Disturbance leads to activation of nociceptors
  - Most widely accepted theory

D3 Clinical Question

- **What is the best treatment to decrease tooth sensitivity?**

PICO Format

P: Geriatric patients with sensitive tooth abfractions

I: Glass ionomer restorative material

C: Desensitizing agents

O: Decreased sensitivity

PICO Formatted Question

- In geriatric patients with tooth abfractions, are glass ionomers superior at resolving sensitivity compared to other desensitizing agents?

Clinical Bottom Line

- The research suggests that glass ionomers can be used as an effective treatment to help reduce dentin hypersensitivity in patients with tooth abfractions.
- The research also shows that other desensitizing agents can be viable alternatives to treating dentin hypersensitivity, as well.

Search Background

- **Date(s) of Search:** October 29-November 2
- **Database(s) Used:** PubMed
- **Search Strategy/Keywords:** Glass ionomer, dentin, sensitivity, hypersensitivity, geriatric

Search Background

- **MESH terms used:** Glass ionomer, dentin, sensitivity, cervical, hypersensitivity

Article 1 Citation, Introduction

Evaluation of dentin hypersensitivity treatment with glass ionomer cements: A randomized clinical trial.

- Citation: Madruga MM, Silva AF, Rosa WL, Piva E, Lund RG. Braz Oral Res. 2017 Jan 5;31:e3. doi: 10.1590/1807-3107BOR-2017.vol31.0003. PMID: 28076496.
- Study Design: Randomized Clinical Trial
- Study Need / Purpose: Assess the effectiveness of glass ionomer cements in treating dentin hypersensitivity

Article 1 Synopsis

- **Method:** The research was focused on 20 subjects aged 20-63 years old (mean age: 42.7 ± 13.2 years) that were sorted into two groups that used different types of resin modified glass ionomer cements. 152 teeth total were affected by dentin hypersensitivity. The first group used ClinproTM XT (70 teeth) and the second group used Vidrion R (82 teeth). Teeth were reevaluated after placement with a tactile and air blast following treatment with resin modified GIC. They waited 20 minutes, 1 week, 2 week, 3 weeks, 1 month, 3 months, and 6 months after application to test the teeth. No subjects were lost during the experiments.

- Most teeth tested were maxillary or mandibular premolars (42.8%), followed by molars, incisors, and canines (20.4%, 19.1%, and 17.8%, respectively).

- The goal for both groups was to decrease long-term dentin hypersensitivity.

Article 1 Sypnosis

- **Results:** During testing at the 6 month follow-up, both groups had less sensitivity when subjected to the tactile and air tests. There was a survival rate of 78.6% over a 5-year follow-up for Class V placements.
- **Conclusions:** Both glass ionomer cements proved effective in reducing hypersensitivity.
- **Limitations:** The subjects had a wide age range from 20-63 years old, would have been preferable if they were 65 years and older.

Article 1 Selection

- This article was selected because it was relevant to the PICO question.
- It was applicable to our patient because glass ionomer restorative material is an option for treatment.
- This research study shows that glass ionomer restorative material is effective at decreasing tooth sensitization of dentin in non-carious cervical lesions.

Article 2 Citation, Introduction

- **Desensitizing toothpaste *versus* placebo for dentin hypersensitivity: a systematic review and meta-analysis**

- Bae JH, Kim YK, Myung SK. J Clin Periodontol. 2015 Feb;42(2):131-41. doi: 10.1111/jcpe.12347. Epub 2015 Jan 9. PMID: 25483802.

- Study Design: Systematic Review and Meta-Analysis

- Study Need / Purpose: Observe the effectiveness of different kinds of desensitizing toothpaste.

Article 2 Synopsis

- **Method:** This study aimed to investigate the effect of potassium-, stannous fluoride-, potassium and stannous fluoride-, strontium-, calcium sodium phosphosilicate-, and arginine-containing desensitizing toothpaste compared to placebo to treat dentin hypersensitivity. Results were recorded by using air blast test scores in adult patients suffering from dentin hypersensitivity.

- 31 randomized control trials that featured 2436 participants, with 1213 making up the intervention group and 1223 in the control group. Follow-up times ranged from 3 days to 12 weeks.

- **Results:** All of the toothpastes besides the strontium-containing toothpaste had favorable results (99% statistical power) after the groups were tested with air blasting and tactile sensitivity at follow-ups.

Article 2 Sypnosis

- **Conclusions:** Compared to the placebo, potassium-, stannous fluoride-, potassium and stannous fluoride-, calcium sodium phosphosilicate-, and arginine-containing toothpaste were deemed effective agents to decrease dentin hypersensitivity, which is a common complication of tooth abfractions.

- **Limitations:** the age ranges across the 31 randomized control trials were consistently around 18-70. An emphasis on an older demographic would have improved this study for our clinical question.

Article 2 Selection

- The reason this research article was selected was because it gave insight into the success of desensitizing agents.
- These could be suitable alternatives for treating dentin hypersensitivity in geriatric patients with abfractions present.

Article 3 Citation, Introduction

- **Comparative evaluation of calcium phosphate-based varnish and resin-modified glass ionomer-based varnish in reducing dentinal hypersensitivity: A randomized controlled clinical trial.**
- Sharma H, Gupta C, Thakur S, Srivastava S. Eur J Dent. 2017 Oct-Dec;11(4):491-495. doi: 10.4103/ejd.ejd_127_17. PMID: 29279676; PMCID: PMC5727735.
- Study design: Randomized controlled clinical trial
- Study Need / Purpose: comparing the effectiveness of a calcium phosphate-based varnish as opposed to a resin-modified glass ionomer-based varnish for the treatment of dentin hypersensitivity.

Article 3 Synopsis

- **Method**: The subject pool was selected by finding patients that had dentin hypersensitivity that was caused by cervical abrasion. The age range was from 18-50 years old. Final sample size was 24 subjects split into two groups; one with MI Varnish, another with Clinpro XT Varnish. Sensitive teeth were tested initially with ice cold water and air blasting. Reactions were based on a 1-10 scale with 10 being the "worst pain possible." After application of the varnishes, a 1 week follow-up test was repeated.

- **Results:** The group with MI Varnish had a statistically significant advantage over the Clinpro XT Varnish group when it came to reducing dentin hypersensitivity at the 1 week follow-up. The mean values of the pain scale for both the ice cold water test (0.4 vs 2.2) and air blast test (0.2 vs 2.2) were lower in the MI Varnish group, meaning less pain.

Article 3 Synopsis

- **Conclusion**: Both types of varnishes helped reduce dentin hypersensitivity. However, MI Varnish was more effective in doing so when compared with Clinpro XT Varnish.

- **Limitations:** There was only 24 subjects, and the age range was 18-50 years old. A larger subject pool as well as increased age range would have been beneficial for our question

Article 3 Selection

- This research study was chosen because it was relevant to our clinical question.
- Relation to patient: it compared a resin modified glass ionomer to another tooth desensitizing option, which could serve as a suitable alternative.

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

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

How does the evidence apply to this patient?

- Consider/weigh: This evidence applies to the patient because it compares glass ionomers to other desensitizing agents in their efficacy to reducing dentinal hypersensitivity. Although the research articles were not specific to geriatric patients, there were still some geriatric subjects in the studies. However, tooth abfractions and non carious cervical lesions were tested in these studies, and these relate to our patient.

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

I would advise my D4 to consider using resin modified glass ionomers, as they are a suitable alternative to other desensitizing agents and are effective in reducing dentinal hypersensitivity. However, there is evidence that some desensitizing agents are more efficient than glass ionomers.

Conclusions: D4

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

- Use RMGI as a restorative material
- Use fluoride varnish as a desensitizing agent

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

- Providing OHI and toothbrushing method techniques
- Placing RMGI as restorative material
- Fluoride varnish application at her 6 month recall appointments.
- Alleviating TMJ complex (equilibrating occlusal contacts) by giving patient an occlusal guard.
- Prescribing Prevident 5000 to help with tooth sensitivity.

Discussion Questions

- If glass ionomers are the standard to treat abfractions, which type would be best indicated for abfractions that extend subgingivally?
- What other tooth desensitizing agents are you comparing glass ionomers to?
- While chronic tensile forces on teeth can lead to unique stress concentrations, can excessive compressive forces cause abfractions too?
- How do glass ionomers resolve tooth abfractions sensitivity?
- Have night guards been used to reduce dentin hypersensitivity in patients with abfractions?
- How effective is Gluma in comparison to using glass ionomers for desensitizing?
- If the hypersensitivity was simply treated with desensitizing agents as opposed to restoring with glass ionomers, what other negative consequences could result from the abfraction?
- Can glass ionomers be useful for other lesions other than abfractions?

THANK YOU