# Fall 2020 Rounds
# **Treating Patients with Limited VDO**

Evidence Based Dentistry Rounds
**Specialty:** Prosthodontics
**Group:** 3B-4
11/11/2020

# Rounds Team

**Group Leader:** Dr. Grady

**Specialty Leader:** Dr. Velasquez

**Project Team Leader:** Sylvana Blanco

**Project Team Participants:**

**D1:** Kiwon Lee

**D2:** Amin Malaki

**D3:** Annalise Avers

# Patient

- Has been a patient of record since 2011, but left for a period of ___ years and came back in ___.  She was assigned to me in __Month, year__ and we completed a Comprehensive Exam on __Month, Year__.
- Age: 75
- Gender: Female
- Ethnicity: Caucasian
- CC: “I want to be able to smile again”
- Additional pertinent info….

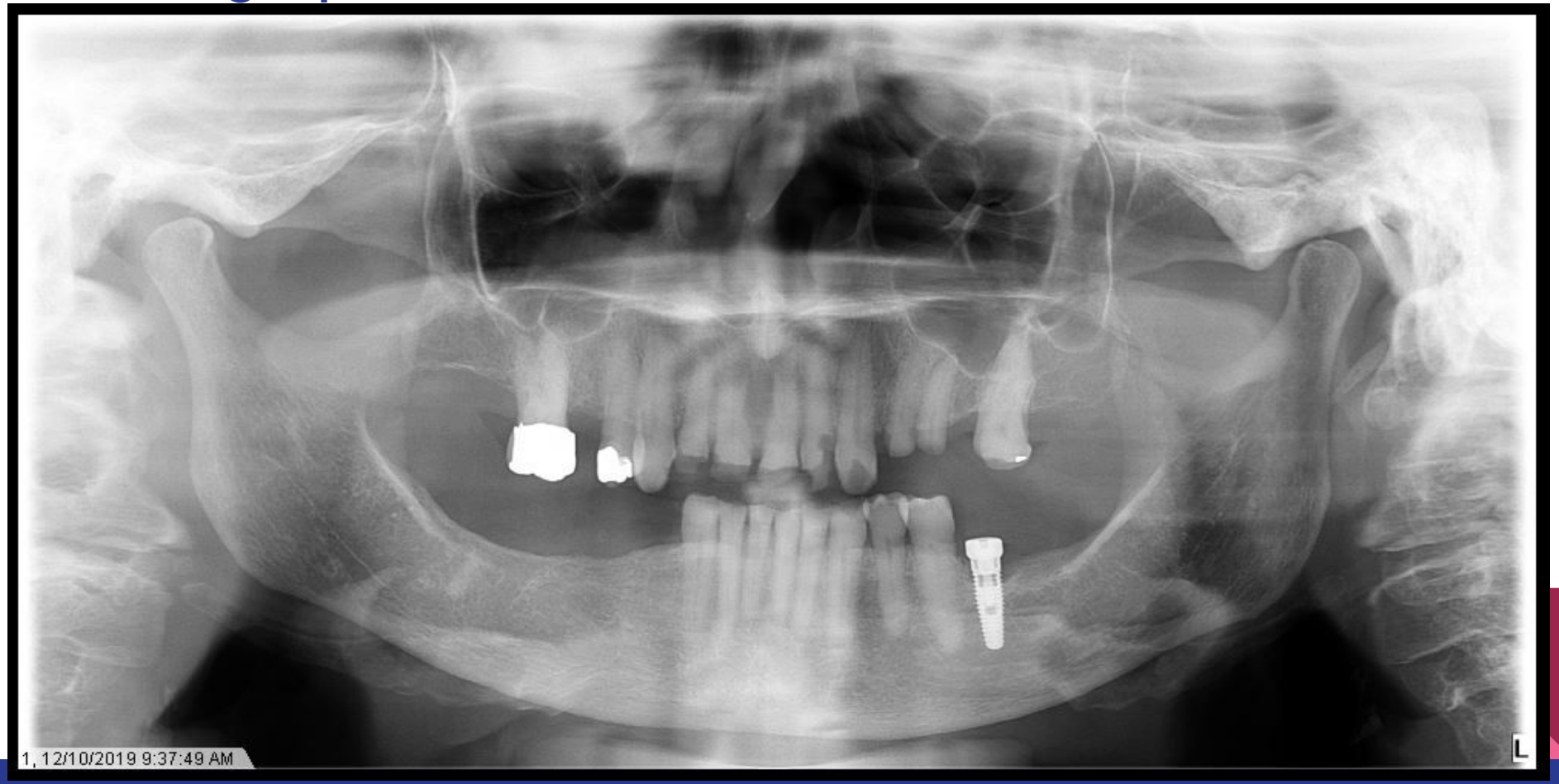
# Medical History

- High Blood Pressure (Lisinopril)
- High Cholesterol (Pravastatin)
- COPD/Emphysema (Albuterol sulfate inhaler, PRN)
- Lupus
- Osteoarthritis
- Fibromyalgia (Ibuprofen PRN for pain, and Temazepam for sleep disturbances due to Fibromyalgia and Lupus)
- Severe Xerostomia (Pt was on a much longer list of medications in _Month, yr__, but list has since become a lot shorter, by PCP, to reduce xerostomia)
- Past Smoker
- Allergies:

# Dental History

- Hx of: EXT’s, restorations, RCT’s, crowns, implant placement
- Dental Problems: Anterior teeth sensitivity, trouble chewing with remaining teeth, caries
- OH: Brushes twice a day, flosses more than once a day
- Esthetic concerns: Unhappy with smile
- CORAH Score: 5, overall relaxed during dental visits

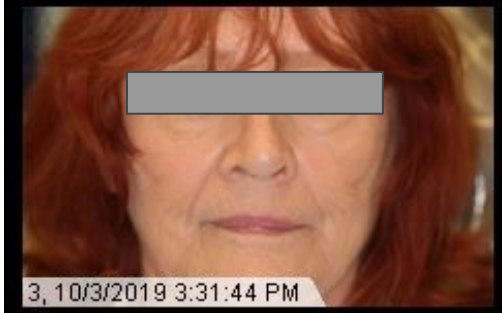
# Radiographs

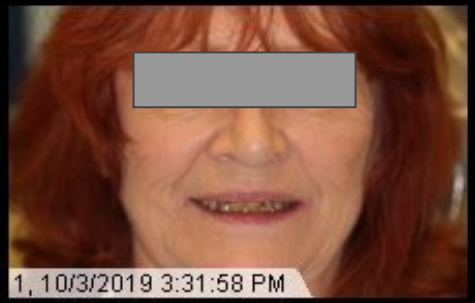


# Radiographic Findings

- Teeth #3, 12, 13, 15 have since been extracted
  - #3 and #15: Supraeruption would limit space for RPD designs, #15 also no longer had a crown and recurrent decay
  - #12 and #13: only root tips were left, deemed non-restorable
- #7-11: Will all be extracted
  - Severe attrition, dentin exposure, sensitivity and compromised esthetics
  - #10 clinical crown was broken off at last appointment
- Bone loss around implant #19
  - The bone loss has been present and not changed much since 2011
  - Was never restored due to finances
  - RPD can be designed around the implant, as per Dr. Ahmed, and can be cleaned with regular maintenance

# Clinical Photos





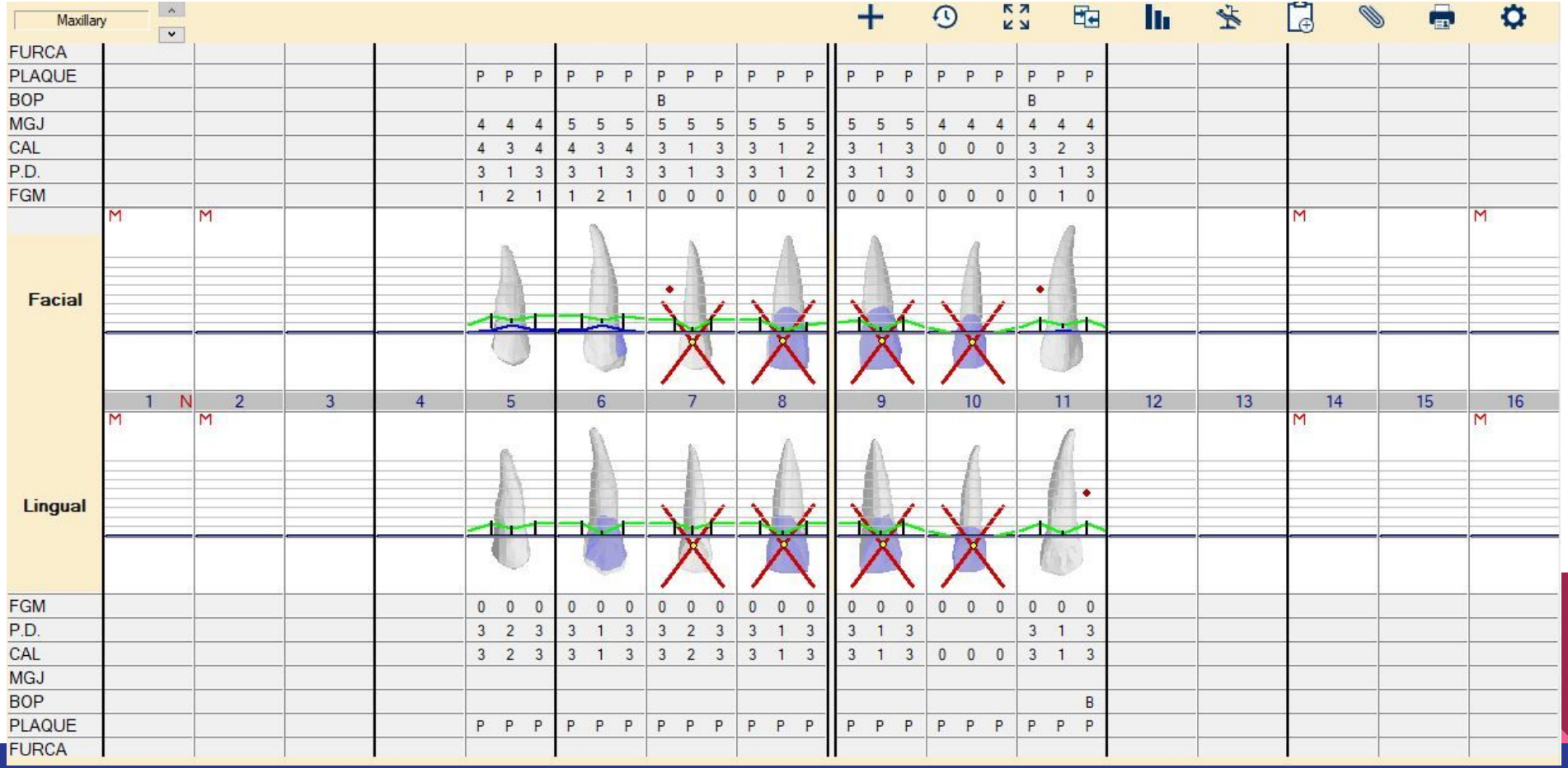
L side


R side

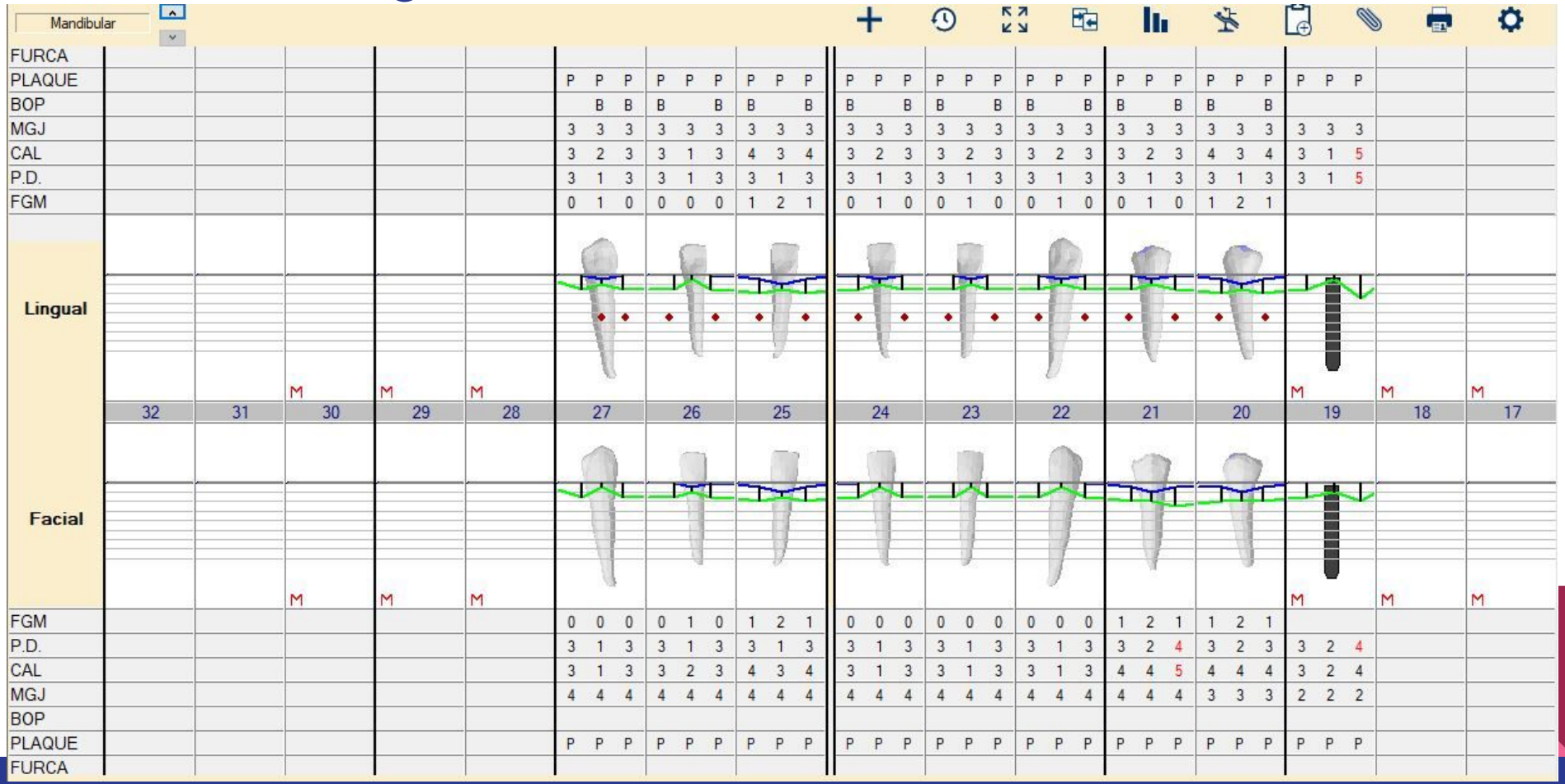
# Clinical Photos

# Specific Findings

# Perio Charting: Maxillary



# Perio Charting: Mandibular



# Diagnosis

# Problem List

# D1 Basic Science Question

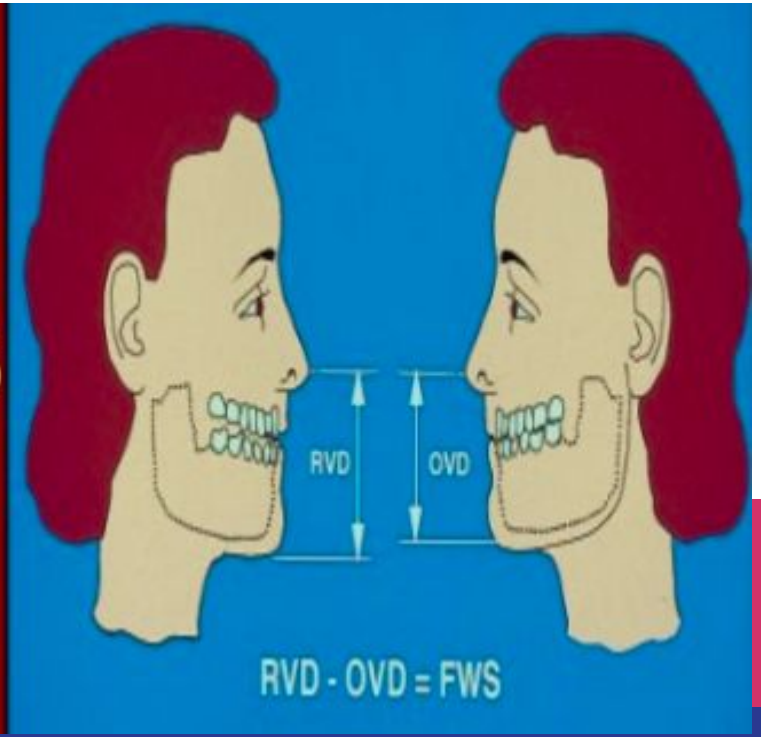
Vertical Distance Occlusion (VDO) is measured as the distance between the occluding maxillary and mandibular teeth at maximum intercuspation. There are many contributing factors in establishing VDO: anatomic features, physiologic needs, craniofacial growth, neuromuscular control, and environmental factors. The clinical consequences of not properly noting VDO may result in compromised esthetics, diminished masticatory functions, and altered phonetics.

Ref: Vinnakota DN, Kanneganti KC, Pulagam M, Keerthi GK. Determination of vertical dimension of occlusion using lateral profile photographs: A pilot study. *J Indian Prosthodont Soc*. 2016;16(4):323-327. doi:10.4103/0972-4052.176531

# D1 Basic Science Question

- Can I use a nightguard to delay VDO loss?
- Does VDO loss mean that I am losing my bones?
- How can I prevent further VDO loss?

- **Vertical dimension at Rest (RVD)**
- **Vertical dimension at Occlusion (OVD)**
- **Free Way Space (FWS)**




https://www.slideshare.net/UDDent/jaw-relation-new4-4-4

# D2 Pathology Question

1-2 slides (summarizes written report in D2 pathology template posted in rounds website)

Include the Pathology Question and Discussion

Remember to add your cited references!!

# D2 Pathology Question

# D3 PICO

Clinical Question: What are possible treatment options for patients with limited arch space?

# PICO Format

**P:** Patients with limited interarch space and possible loss of VDO

**I:** Restoring anterior VDO with crowns

**C:** Restoring anterior VDO with incisal composite

**O:** Better long term success with crowns

# PICO Formatted Question

In patients with limited interarch space and possible loss of anterior VDO, is the long term prognosis better with use of crowns as compared to the use of incisal composite restorations?

# Search Background

- **Date(s) of Search:** 10/18/20, 11/1/20, 11/2/20
- **Database(s) Used:** PubMed
- **Search Strategy/Keywords:** Anterior restorations, Etiology of tooth wear, Composite resin restorations, Fixed restorations, Occlusal Vertical Dimension, Loss of interocclusal space

# Search Background

- **MESH terms used:**
  - Vertical dimension
  - Tooth abrasion
  - Tooth attrition
  - Tooth erosion
  - Crowns
  - Composite resin
  - Dental occlusion
  - Adult
  - Incisor

# Article 1:
## *Restoration of the extremely worn dentition*

- **Citation:** Turner, K. A., & Missirlian, D. M. (1984). Restoration of the extremely worn dentition. *The Journal of prosthetic dentistry*, *52*(4), 467–474. https://doi.org/10.1016/0022-3913(84)90326-3
- **Study Design:** A Review
- **Study Need/Purpose:**
  - ????

# Article 1 Summary

- Tooth wear is multifactorial; most often attributed to attrition
- Problems/concerns with increased OVD:
  - Symptoms of clenching teeth, muscle fatigue, soreness of teeth/muscles/joints, headaches, and continued tooth wear
- Loss of posterior support is the most common cause of decreased OVD
- Tooth wear is typically a gradual process, over the course of many years and generally compensated by continuous eruption
- 3 categories → and possible treatment options

# Article 1 Summary Continued

- **Category 1: Excessive wear with loss of OVD**
  - Missing  few posterior teeth, unstable posterior occlusion, excessive wear on anterior teeth
  - Trial restorations are important
  - Evaluation for comfort/function at new dimension PRIOR to fixed restoration placement
- **Category 2: Excessive wear without loss of OVD but with space available**
  - Adequate posterior support, long history of gradual wear caused by bruxism, moderate oral habits, continuous eruption has maintained OVD
  - Significant shift seen from CR → MIP
  - Equilibration of posterior teeth for stability in CR
  - Tooth preparation to establish retention/resistance form (pins/grooves may be indicated; possible surgery needed to gain clinical crown length)
- **Category 3: Excessive wear without loss of OVD but limited space**
  - Most difficult because vertical space must be obtained for restorative material
  - Might require orthodontic tx, surgical repositioning of segments, restorative repositioning, and programmed OVD modification

# Article 1 Synopsis

- Methods
- Results
- Conclusions:
  - Restorations of extremely worn dentition is a challenge for dentists
  - Need to carefully evaluate all the factors present (etiology, history, etc.)
  - There are various modalities that are successful in treating these patients
- Limitations:
  - No actual clinical trials used in this review

# Article 1 Selection

1 slide

- Reason for selection:
  - Clinically relevant to the patient, who presents with an extremely worn anterior dentition
  - Considerations for treatment of extremely worn dentition
- Applicability to your pt:
  - Treatment options depending on clinical presentation
- Implications
  - ?

# Article 2:
## *Identification and management of tooth wear*

- **Citation:** Johansson, A., & Omar, R. (1994). Identification and management of tooth wear. *The International journal of prosthodontics*, *7*(6), 506–516.
- **Study Design:** A Review
- **Study Need/Purpose:**

# Article 2 Summary

- Progressive tooth wear is multifactorial
  - Attrition, diet, disease, salivary composition, bruxism
- Tooth wear more commonly seen in anterior teeth compared to posterior
- Important during clinical exam to:
  - Analysis of  static and dynamic occlusal relationships (TMD should also be analyzed)
  - Salivary analysis
- Once you have a differential diagnosis, treatment planning can begin
- Treatment is focused initially on eliminating the main etiologic factors of tooth wear for the patient
- When esthetics or function are substantially compromised, prosthodontic therapy is indicated
- Fixed restorations should be designed as single units when possible & should be of minimal extension

# Article 2 Summary Continued

**Table 6** Characteristics of Different Wear Mechanisms

| | Attrition | Erosion | Abrasion |
|---|---|---|---|
| Location | Incisal/occlusal surfaces; mainly anteriorly | Upper palatal surfaces; buccal surfaces, mainly anteriorly | Buccal surfaces; mainly at cementoenamel junction |
| Severity | Normally moderate; can be severe | Potentially very severe | Normally mild; sometimes moderate and seldom severe |
| Topography | Well-defined facets; sharp edges and angles; flat surface | Occlusal contacts lost; the pulp may be visible; "saucer"-shaped defects bucally and sometimes palatally | V-shaped defects; more severe in premolar/canine regions and less in the incisor/molar segments |
| Enamel/dentin texture | Normal; shining facets | Matte, silky enamel; sometimes very thin enamel edges; large areas of exposed dentin | Well-defined defects; often involving both enamel and dentin |
| Subjective complaints | Seldom; sometimes esthetics | Sensitivity | Seldom; sensitivity, if extensive |

# Article 2 Synopsis

- **Conclusions:**
  - Management should be first directed toward elimination of etiologic factors
  - Important to have a complete clinical examination to narrow in on a differential diagnosis
  - Regardless of restorative decision, regular recall of these patients is essential
- **Limitations:**
  - Patient is not a bruxer, but because of posterior tooth loss → anterior teeth have been compromised

# Article 2 Selection

- Reason for selection:
  - Important to identify the main cause of tooth wear prior to initiating treatment
  - Diagnosis and proper treatment planning will help improve the effectiveness of preventive and restorative care
- Applicability to your pt:
  - “Increasing the vertical dimension is only necessary for patients in whom interocclusal space problems or esthetic considerations are critical”
- Implications:
  - treatment

# Article 3:

## *Tooth wear treated with direct composite restorations at an increased vertical dimension: Results at 30 months*

- **Citation:** Hemmings, K. W., Darbar, U. R., & Vaughan, S. (2000). Tooth wear treated with direct composite restorations at an increased vertical dimension: results at 30 months. *The Journal of prosthetic dentistry*, *83*(3), 287–293. https://doi.org/10.1016/s0022-3913(00)70130-2
- **Study Design:** Individual Cohort Study
- **Study Need/Purpose:**

# Article 3 Synopsis

**Method:** 30-month prospective clinical trial using direct composite restorations for the treatment of localized anterior tooth wear

- **Group A =** restored with Durafill composite and scotchbond multipurpose dentine adhesive system
- **Group B =** Herculite XRV composite and Optibond dentine bonding agent
- Specific Inclusion Criteria
  - 1. Tooth wear localized to max/mand anterior teeth with loss of interocclusal space
  - 2. At least 4 teeth were in need of restorations
  - 3. Tooth wear was clinically significant with dentine exposure, usually with a reduction in crown height
  - 4. Patients had intact dentitions with no fixed partial/removable dentures
  - 5. Stable periodontal conditions, good oral hygiene, no probing depths over 3 mm

# Article 3 Synopsis Continued

- Results:
  - Success/failure was documented with any adverse event affecting the restoration
    - Fracture, marginal discoloration, loss of marginal integrity, noticeable wear, pain/sensitivity, endodontic failure, and esthetic failure

**Table III.** Table showing mode of failure and action taken after failure. In group B, 2 failures were not repaired as they were clinically insignificant

| Group | Fracture | Stain | Lost | (Repair) | (Replace) | Total failures |
|---|---|---|---|---|---|---|
| A | 18 | 10 | 5 | (24) | (9) | 33 |
| B | 2 | 2 | 2 | (2) | (2) | 6 |

# Article 3 Synopsis Continued

- **Conclusions:**
  - Hybrid composites were shown to perform better than the microfilled composites
    - Durafill = microfiller
    - Herculite XRV = microhybrid
  - Direct composite restorations placed at an increased OVD can provide short term restorative solutions with localized anterior tooth wear
  - With repeated failure, one patient was given 6 anterior PFM crowns
- **Limitations:**
  - Time of the study (only 30 months)
  - Limited number of patients (16)

# Article 3 Selection

1 slide

- Reason for selection:
  - Patient would prefer cost-effective method (financial limitation)
  - This method is considered a good possible treatment option for patient
- Applicability to your pt:
  -
- 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

# 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 |

# Clinical Bottom Line

- Although evidence and clinical trials remain limited, there are advantages and indications for both crowns and incisal composite restorations
- Any time you alter a patient's occlusal vertical dimension, it is important to allow the patient to have trial restorations to assess level of comfort and acceptance
- Based on the main etiology of tooth wear there may be limited clinical crowns remaining, thus, requiring more extensive periodontal surgery in order to properly restore these teeth with crowns
- Composite restorations are more conservative and cost effective

# Conclusions: D3

How does the evidence apply to this patient?

Consider/Weigh:

- Literature
- Group leader and Specialist experience
- Pt circumstances and 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?

How will you help your pt?

# Discussion Questions

1-2 slides

List posted discussion questions

Questions may also be from GL or specialist

# Thank you!