PUBLIC HEALTH

EVIDENCE BASED DENTISTRY ROUNDS SPECIALIST – DR. VELASQUEZ

DATE 10/21/2020

ROUNDS TEAM

- **Group Leader: Dr. Pelz**
- **Specialty Leader: Dr. Velasquez**
- **Project Team Leader: Jake Wallock**
- **Project Team Participants:**
  - **D3 Mary Lovell**
  - **D2 Drake Lindholm**
  - **D1 Zoya Shams**

CASE ABSTRACT

- 67 year old African American female presents for routine exam
- Chief Complaint: "I'm here to get some x-rays and see what treatment needs to be done"
- Medical History:
  - History of heart murmurs and hypertension
  - Sleep Apnea
  - Type II Diabetes
  - Depression
  - Osteoarthritis
- Dental History:
  - Last visit was over 2 years ago
  - Has a hard time staying numb during treatment
  - Sensitivity to cold, sweets, and pressure
  - Brushes twice a day and flosses once a day

MEDICAL HISTORY

- Heart / Blood Pressure
  - Heart Murmur
  - Hypertension
- Respiratory
  - Sleep Apnea
- Diabetes / Endocrine
  - Type II Diabetes
- Neurologic
  - Depression
- Muscle / Bone / CT
  - Osteoarthritis

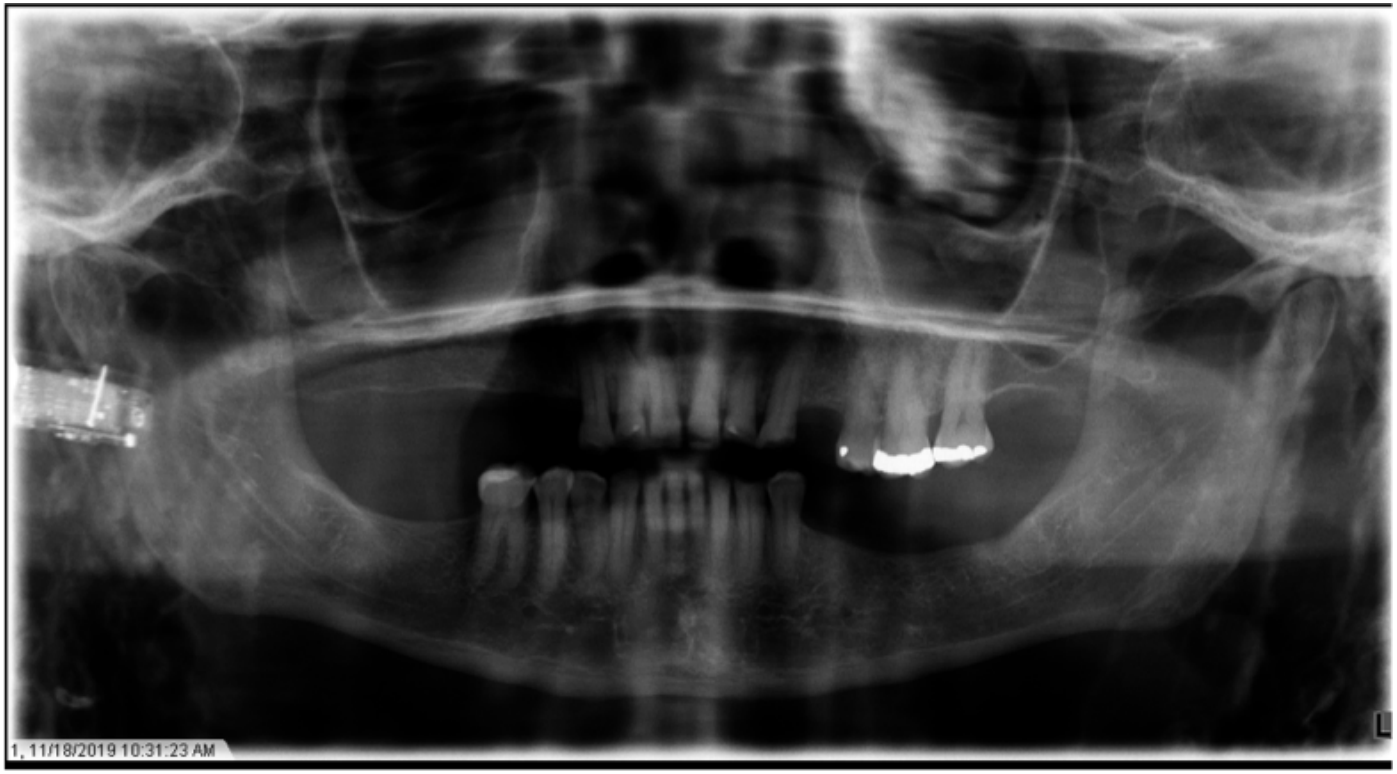
MEDICATIONS

- Amlodipine – Hypertension
- Losartan – Hypertension
- Glimepiride – Diabetes
- Metformin – Diabetes
- Insulin – Diabetes
- Fluoxetine– Depression
- Diclofenac – Osteoarthritis
- Aspirin – Daily
- Calcium, Vitamin D, Bitamin B 12

DENTAL HISTORY

- Has had trouble staying numb during past procedures
- Teeth sensitivity:
  - Cold, Sweets, Pressure
- Brushes: twice a day
- Flosses: once a day

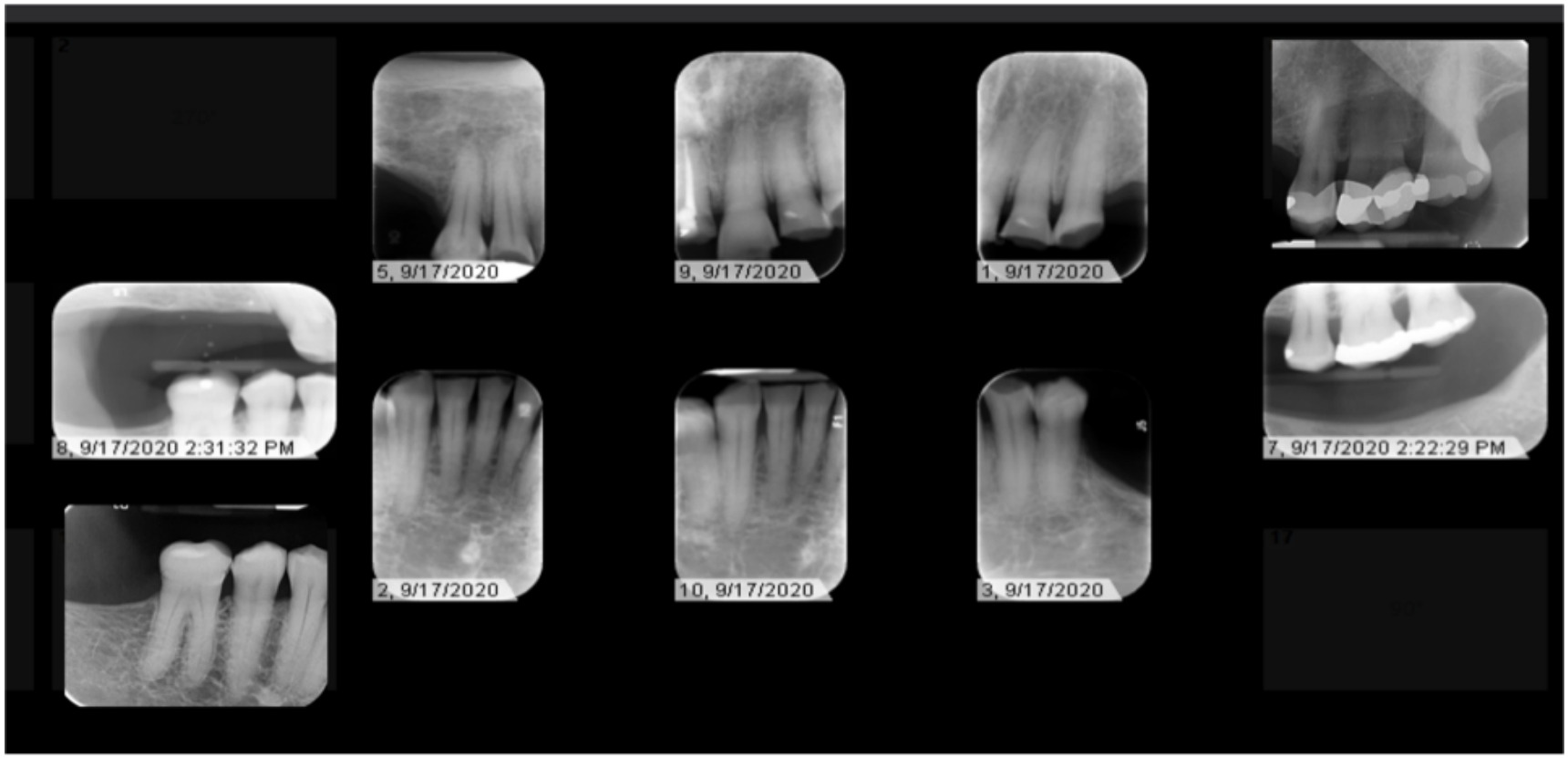
PANORAMIC RADIOGRAPH 11/18/2019



RADIOGRAPHIC FINDINGS

- Generalized Horizontal Bone Loss
- Attrition of Anterior Teeth
- Peri-apical Radiolucency #8
- PA from 12/12/2019

RADIOGRAPHS 9/17/2020

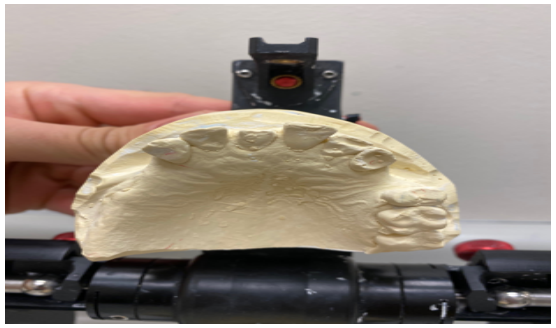


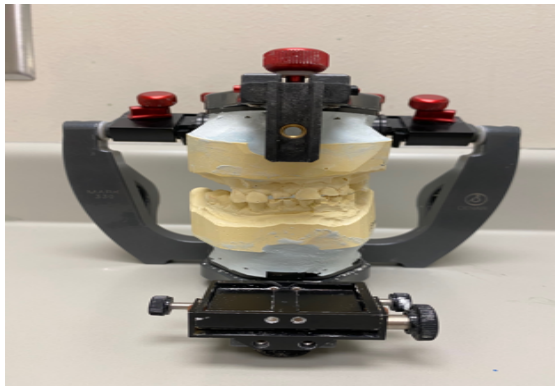
CLINICAL FINDINGS

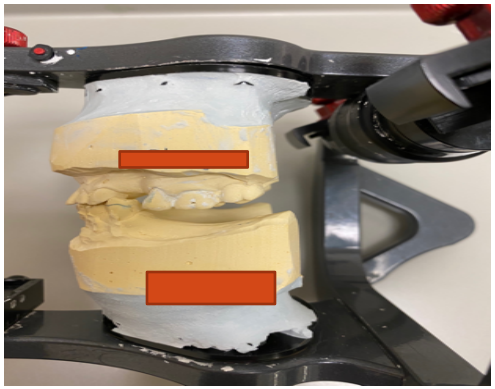
- Missing Teeth: 1-5, 12, 16, 17-20, 31,32
- Traumatic occlusion exposing dentin and labially flaring anterior teeth
- Caries: 29 DO
- #8 Diagnosis
  - Pulpal Necrosis
  - Asymptomatic Irreversible Periodontitis

CLINICAL PHOTOS

MOUNTED CASTS





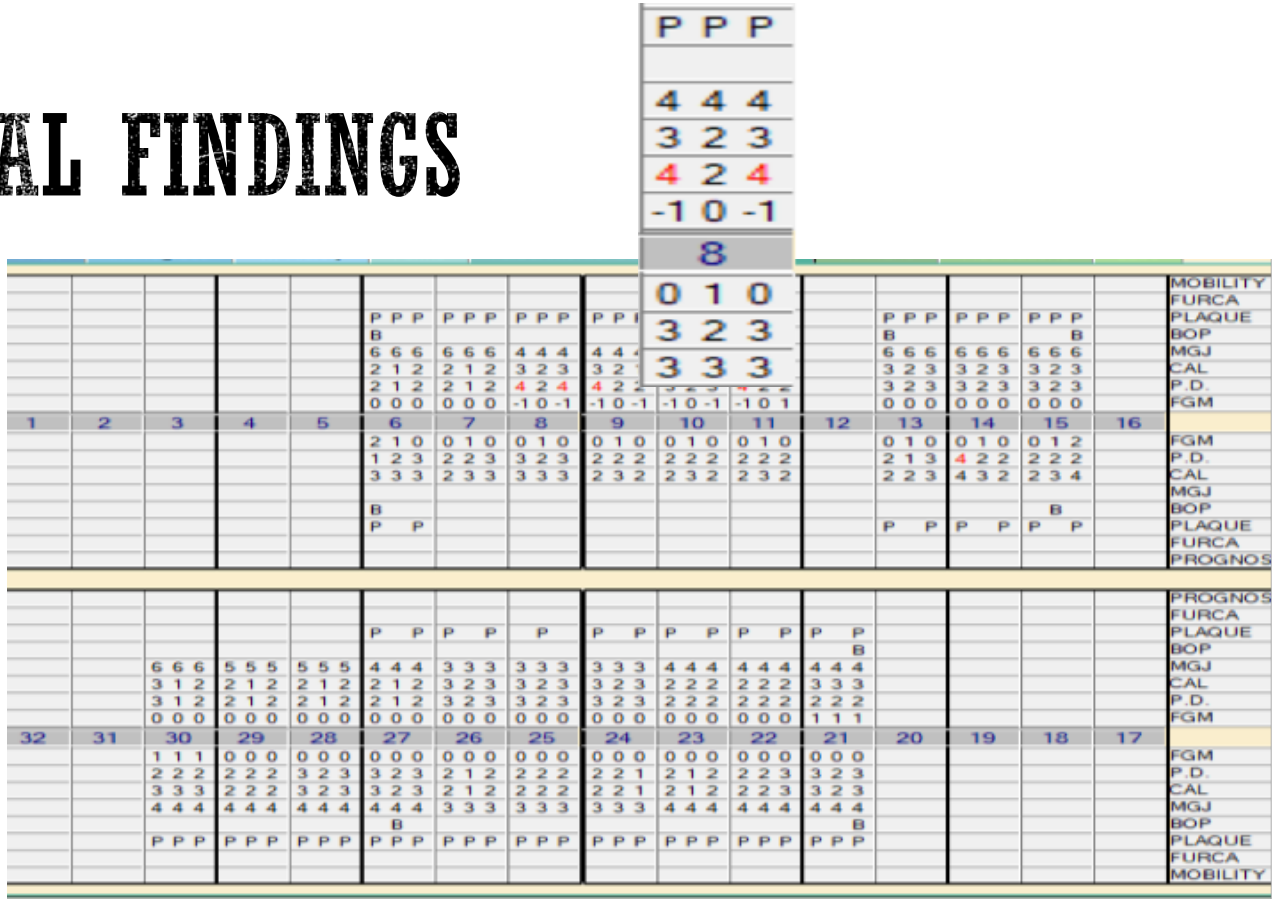


SPECIFIC FINDINGS

- Loss of the vertical dimension of occlusion and labially flared anterior teeth

PERIODONTAL FINDINGS

- Generalized plaque
- Slight BOP
- CAL within normal limits
- Diagnosis: Stage IV Periodontitis, Grade C
  - >5 teeth missing due to periodontitis
  - Complex rehabilitation needed due to masticatory dysfunction
  - HbA1C > 7.0%



PROBLEM LIST

- Missing Teeth
- Caries
- Periodontal Disease
- Traumatic Occlusion
- Attrition

DIAGNOSIS

- Traumatic occlusion resulting in pulpal necrosis of 8 and severe attrition of anterior teeth

D1 BASIC SCIENCE

In eccentric movements, how does anterior teeth function differ from that of posterior teeth?

Eccentric Movement → any movement of mandible from intercuspal position that results in tooth contact

- retrusive, mediotrusive, protrusive, and laterotrusive

Anterior teeth → guidance, mastication, sound, esthetics

Posterior teeth → breaking up food during mastication while maintaining vertical dimension of occlusion

Anterior guidance→ contacts guide mandible

D2 "WHAT ARE THE CONSEQUENCES OF TRAUMATIC OCCLUSION?"

Traumatic Occlusion Consequences

- Stillman's definition of Occlusal Traumatism: "abnormal stress capable of producing injury to dental or periodontal tissues."
- Acute Vs. Chronic/ Primary Vs. Secondary
- Parafunctional factors are stressed as the major etiologic factor of chronic trauma from occlusion (TFO).
- Three stages of tissue responses to TFO: Injury, Repair, Adaptive Periodontal Remodeling
- Consequences: permanent PDL widening with areas of hyalinization and necrosis, alveolar bone thickening or destruction, tooth mobility.
- Possible pulpal necrosis*

Singh, Dhirendrakumar, et al. "Trauma from Occlusion: The Overstrain of the Supporting Structures of the Teeth." *Indian Journal of Dental Sciences*, vol. 9, no. 2, 2017, p. 126., doi:10.4103/ijds.ijds_21_16.

D3 PICO

- P: Patients with limited finances
- I: Patients with compromised posterior support
- C: Adequately restored posterior dentition
- O: Relieve occlusal trauma and improve quality of life

PICO FORMATTED

- In patients with limited finances, how does a compromised posterior dentition affect the quality of life in comparison to patients with an adequate dentition?

CLINICAL QUESTION

- In a public health setting, how do you restore anterior teeth without posterior support and limited finances?

SEARCH BACKGROUND

- MESH terms used: Occlusal disharmony, vertical dimension of occlusion, removable partial denture

SEARCH BACKGROUND

- Date of Search: 9/5/2020
- Database Used: Pub Med
- Search Strategy/Keywords: Occlusal trauma, vertical dimension of occlusion, posterior support, removable partial denture

ARTICLE 1: "DETERMINATION OF OCCLUSAL VERTICAL DIMENSION: A LITERATURE REVIEW"

- Citation:
  - Fayz, Farhad, and Ahmad Eslami. "Determination of Occlusal Vertical Dimension: A Literature Review." *The Journal of Prosthetic Dentistry*, Mosby, 2 Aug. 2006, www.sciencedirect.com/science/article/abs/pii/0022391388901825.

- Study design: Meta-analysis/Systemic Review

- Study need/purpose: To analyze VDO measuring techniques

ARTICLE 1 SYNOPSIS

- Vertical dimension of occlusion (VDO) is the length of the face as determined by separation amount of upper and lower jaw
- Many techniques have been used to measure this amount and differences have been noted in edentulous vs. dentulous patients
  - Examples includes: pre-extraction records, jaw positions while speaking, and cephalometric radiographs
- This article looked at many literature articles and concluded there isn't a universally accepted standard when it comes to measuring VDO in edentulous patients
- Also concludes there's no significant advantage or disadvantage of any measuring techniques
- End goal: The VDO should be determined by selecting a VDO that provides optimal esthetics, functional, and does not change the patient's profile

REASON FOR SELECTION OF ARTICLE 1

- Provides and understanding of the vertical dimension of occlusion and how it is measured
- Develop an understanding for a loss of the VDO and the difficulties of restoring a compromised dentition

ARTICLE 2: "ORAL HEALTH-RELATED QUALITY OF LIFE OF REMOVABLE PARTIAL DENTURE WEARERS AND RELATED FACTORS"

- Citation:
  - Shaghaghian, S., et all. "Oral health-related quality of life of removable partial denture wearers and related factors." *Journal of Oral Rehabilitation,* 30 July 2014, https://0-onlinelibrary-wiley-com.libus.csd.mu.edu/doi/epdf/10.1111/joor.12221
- Study design: Cross Sectional Study
- Study need/purpose: Analyze the psychological and physical effects of inadequate posterior occlusion

ARTICLE 2 SYNOPSIS

- The goal of this study was to identify the quality of life RPD patients experience, including demographic questions (age, gender, oral health) and oral health-related questions related to quality of like among the Iranian population
- 200 patients with a single or double RPD worn for at least 8 week, with or without complete dentures, verbally filled out an interview questionnaire
- Results: Of the 200, 110 were over 50 years old and 122 were women. Major results included 27% interrupted meals, 24% uncomfortable to eat, 15% self conscious, 47% diet was unsatisfactory and 15% food tastes worse
- Conclusions: Patients with inadequate or lacked removable prostheses had the lowest scores for speaking, chewing, and oral hygiene. Comfort, esthetics and function remain to be the highest variables affected RPD quality of life.

REASON FOR SELECTION OF ARTICLE 2

- This article evaluates the the quality of life in patients missing posterior support
- This article is important to appreciate how critical it is that we re- establish our patient's posterior support to improve her quality of life.

ARTICLE 3: "MAXIMUM CLENCHING FORCE OF PATIENTS WITH MODERATE LOSS OF POSTERIOR TEETH: A PILOT STUDY"

- Citation:
  - Gibbs, Charles H., et al. "Maximum Clenching Force of Patients with Moderate Loss of Posterior Tooth Support: A Pilot Study." *The Journal of Prosthetic Dentistry*, Mosby, 8 Jan. 2003, www.sciencedirect.com/science/article/pii/S0022391302002585.

- Study design: Randomized Controlled Trial

- Study need/purpose: To analyze biting forces in patients missing posterior teeth

ARTICLE 3 SYNOPSIS

- This study looked at the question of patients who lost moderate posterior tooth support may also clench, leading to increased loading forces and changes in facial muscles as a result of clenching.
- Goal = test the hypothesis that moderate posterior tooth loss will have a statistically significant effect on forces of clenching
- 44 adults with posterior tooth loss were compared to 20 healthy (full dentition) adults. It was concluded that clenching forces could be identified in the 1st and 2nd molars and 2nd premolars (when present). The correlation between clenching forces and posterior tooth loss was evaluated
- The average clenching forces for the 44 adults with posterior tooth loss was 462N (104lbs), compared to the 20 full dentition patients which was 720N (162lbs).
- Conclusion: There is association between losing clenching forces and having a significant number of teeth missing posteriorly (258N, 58lbs less force with posteriorly edentulous patients) The range of biting forces was surprisingly large for both groups

REASON FOR SELECTION OF ARTICLE 3

- This article provides an understanding of how little biting force our patient has in comparison to patients with posterior occlusion
- The amount of force applied by patient's without posterior teeth (462N) is still a significant amount of force that anterior teeth are not designed to be subjected to

CLINICAL BOTTOM LINE

- The combination of a loss of the vertical dimension and inadequate posterior biting forces has created a pathological occlusion on our patient's anterior teeth
- Before we can restore the anterior teeth we must provide the patient with posterior support to balance the clenching forces of the jaw
- The challenge of a lost vertical dimension will require us to design a partial denture that is not ideal but is still functional to improve the patient's quality of life

LEVELS OF EVIDENCE

Levels of Evidence: (For Therapy/Prevention, Etiology/Harm)

See http://www.cebm.net/index.aspx?o=1025

- ☐ **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)

Strength of Recommendation Taxonomy (SORT) For Guidelines and Systematic Reviews

See article **J Evid Base Dent Pract 2007;147-150**

☒ **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

- The evidence shows that patients without posterior teeth and a lost vertical dimension will live extremely compromised life styles leading to mental disorders such as depression
- From a public health perspective it is our job as dentists to find solutions for difficult cases with limited finances

CONCLUSIONS: D4

- A definitive prosthesis is required to improve the patient's quality of life
- We cannot address issues in the anterior teeth until posterior support is established
- A maxillary full over mandibular partial denture is indicated eventually
- A transitional partial over partial denture will help the patient ease into their new mouth

DISCUSSION QUESTIONS?

THANK YOU