Treating Patient's with Parkinson's

Evidence Based Dentistry Rounds
Specialty: Special Needs
Group 7A-5
Date: October 14th, 2020

Rounds Team

- Group Leader: Dr. Rossi
- Specialty Leader: Dr. Arif-Holmes
- Project Team:
  - D4 – Jack Orzepowski
  - D3 – Tyler Huhn
  - D2 – Hector Alvarez
  - D1 – Christine McMahon

Patient

- 74-Year-Old Caucasian Male
- Chief Complaint: "I want my teeth fixed"
- Is not particularly interested in esthetics

Medical History

- Parkinson's Disease
  - Diagnosed over 30 years ago
- Bi-Polar Depression
- Hx of Strokes
- Hx of Seizures
- High Blood Pressure
- High Cholesterol
- GERD
- Anemia
- Rheumatoid Arthritis
- Allergy to Haldol (antipsychotic)
  - Hinted to having a psychiatric condition

Medications

- ***Carbidopa-Levodopa-Entacapone***
  - ***Levodopa*** – dopamine once it crosses the BBB
  - ***Carbidopa*** and ***entacapone*** – prevent breakdown of levodopa in bloodstream
- ***Ropinirole*** – dopamine agonist
- ***Bupropion Hcl*** – antidepressant
- ***Mirtazapine*** – antidepressant
- ***Clopidogrel*** – antiplatelet/blood thinner (stroke)
- ***Clonazepam*** – anti-epileptic benzodiazepine
- ***Lamotrigine*** – anti-convulsant, used for bi-polar depression

Medications continued…

- ***Lisinopril*** – ACE inhibitor (high BP)
- ***Amlodipine*** – calcium channel blocker (high BP)
- ***Doxazosin*** – alpha blocker (high BP)
- ***Pravastatin*** – HMG-CoA reductase inhibitor (high cholesterol)
- ***Pantoprazole*** – proton pump inhibitor (GERD)
- ***Sucralfate*** – antacid for duodenal ulcers (GERD)
- ***Metoclopramide*** – (GERD)
- ***Ferrous Sulfate*** – iron deficiency anemia
- ***Acetaminophen*** – treats pain (arthritis), antipyretic
- ***PreviDent 5000 Dry Mouth*** and ***Biotene Oral Rinse***

Considerations

- Motor Deficiencies
  - Hygiene struggle
- Dry Mouth
  - Extensive medication list
- GERD
- All add up to create an environment conducive to high decay rates

- Trouble getting numb?

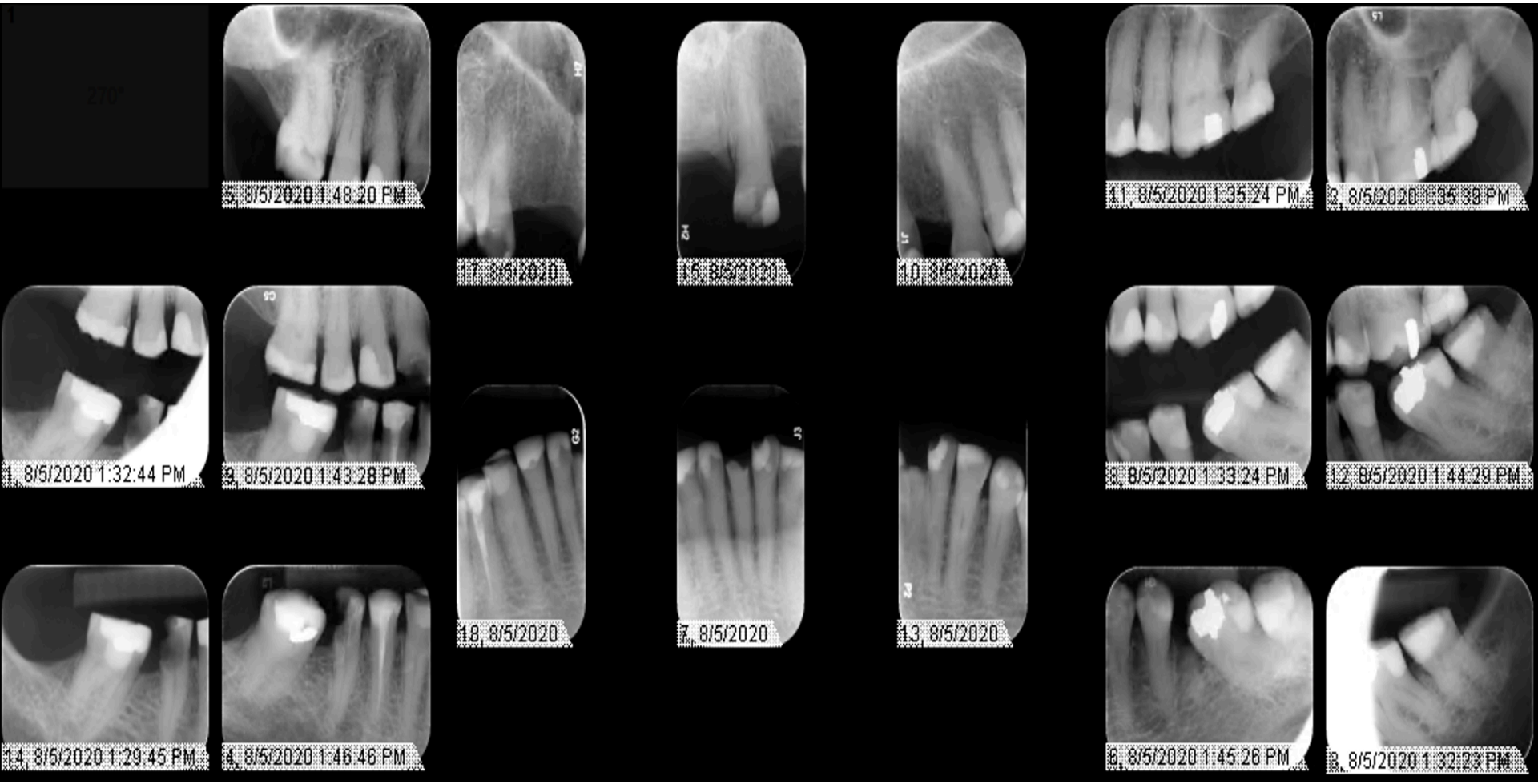
Dental History

- History of extractions, endo, and extensive restorative work
- Currently in no pain, sensitive to sweets
- No TMJ disorders
- Rarely brushes, never flosses
- Bruxer

Disabilities

- Parkinson's
- Bi-Polar Depression
- Can give informed consent, but having wife there during appointments helps with communication

Radiographs



Radiographs

Radiographs

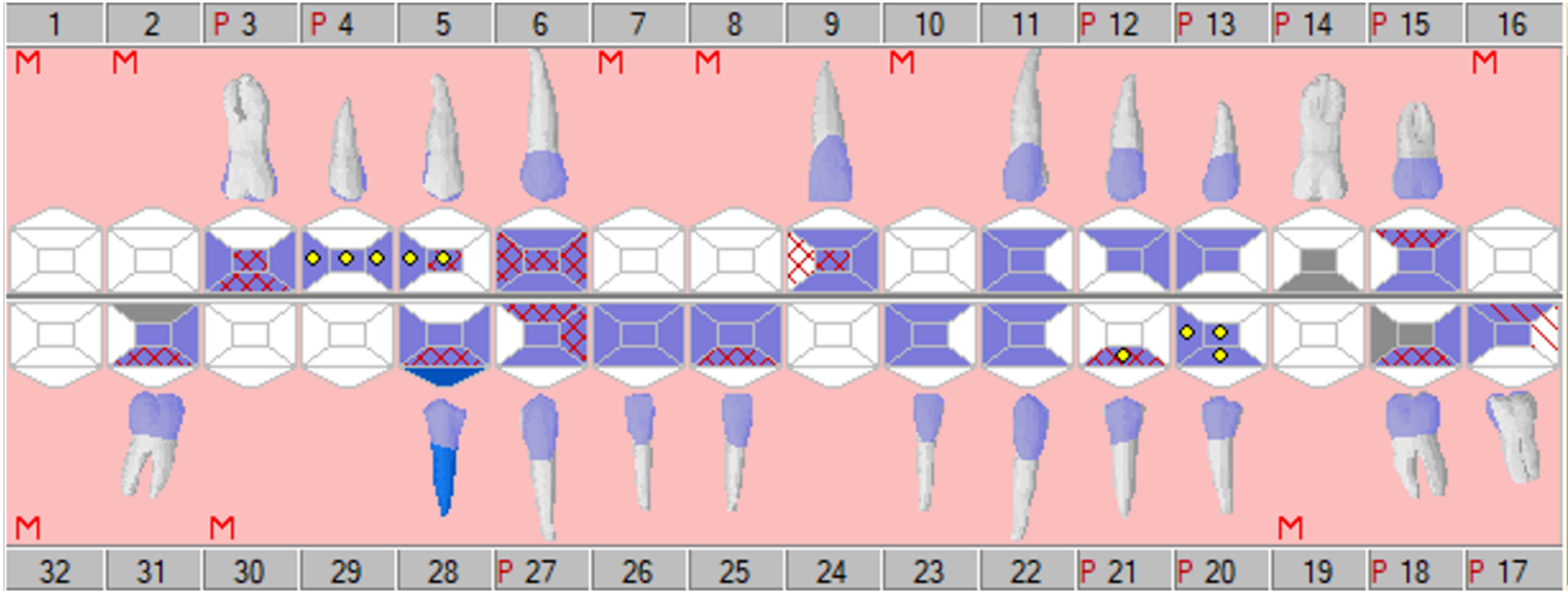
Radiographic Findings

- #'s 1, 2, 7, 8, 10, 16, 19, 30, 32 missing
- #4 D primary caries
- #9 D primary caries
- #20 M primary caries
- #24 coronal fracture – non-restorable
- #28 endo treated
- #29 gross caries – non-restorable

Clinical Findings

- #3 OL recurrent caries
- #5 DO recurrent caries
- #6 MOD recurrent caries
- #15 B recurrent caries
- #17 DL incipient caries
- #18 B recurrent caries
- #21 B recurrent caries
- #25 B recurrent caries
- #27 ML recurrent caries
- #28 B recurrent caries
- #31 B recurrent caries

Odontogram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Periodontal Charting

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Diagnosis

- Primary and Recurrent Decay
- Stage I Grade B Periodontitis
  - Gingivitis

Problem List

- Caries
- Gross Caries
- Missing Teeth
- Fractured Teeth
- Home Care!
- Defective Restorations
- Esthetics?

Specific Findings

- Patient seemed confused/disoriented when I first introduced myself
- However, tolerated exam/prophy well and became more talkative towards the end of the appointment
  - Important to document these types of interactions with these patients

What is xerostomia?

Dry Mouth

Salivary glands are not producing enough saliva to keep the mouth sufficiently wet

Causes:

- Medication
- Disease
- Radiation therapy
- Chemotherapy
- Alcohol
- Snoring
- Smoking

Xerostomia

Symptoms:

- Mouth and throat dryness
- Bad breath
- Tooth decay
- Plaque
- Difficulty swallowing, chewing, or speaking

Treatments:

- Changes in medication
- Oral rinses or sprays
- Saliva substitutes
- Topical gels
- Chewing sugar-free gum
- Sipping water often

References: "Dry Mouth Causes, Symptoms, Diagnosis, Treatment." *National Institute of Dental and Craniofacial Research*, U.S. Department of Health and Human Services, July 2018, www.nidcr.nih.gov/health-info/dry-mouth/more-info?_ga=2.10121975.353174889.1602029498-165048390.1476136437.
Millsop, Jillian W., et al. "Etiology, Evaluation, and Management of Xerostomia." *Clinics in Dermatology*, vol. 35, no. 5, 2017, pp. 468–476., doi:10.1016/j.clindermatol.2017.06.010.
"Xerostomia (Patient Education - Disease and Procedure)." *Lexicomp for Dentistry*, o-online.lexi.com.libus.csd.mu.edu/lco/action/doc/retrieve/docid/disandproc/3558370?cesid=30lr499AwXD.

What is The Pathology of Parkinson's Disease?

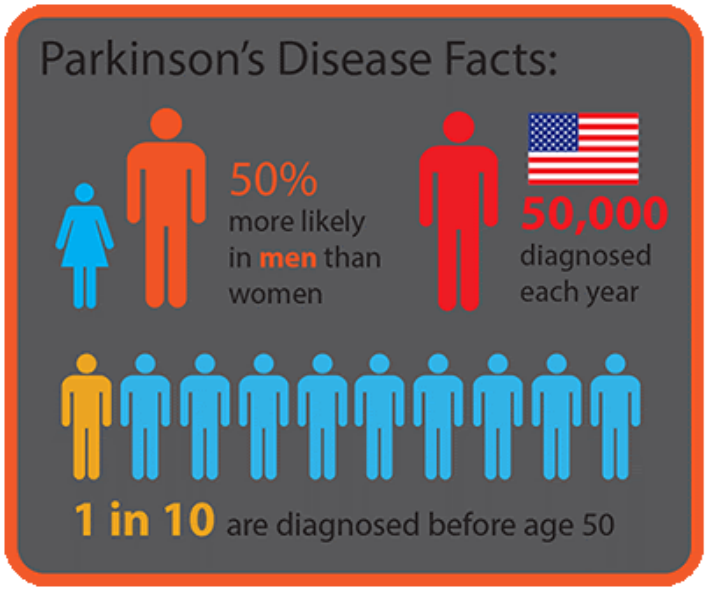
By: Hector Alvarez

The Causes of Parkinson's Disease

There is no known, definitive cause to Parkinson's Disease

Risk Factors

- ***Age***
  - Greater incidence in people past their midlife
- ***Heredity***
  - Family history with Parkinson's.
  - Typically, risk is directly proportional to number of family members that have Parkinson's
- ***Sex***
  - Males > Females
- ***Toxins***
  - Not as significant a risk factor
  - Pesticides and herbicides
    - Regular exposure for prolonged periods of time may slightly increase your risk of getting Parkinson's later in life

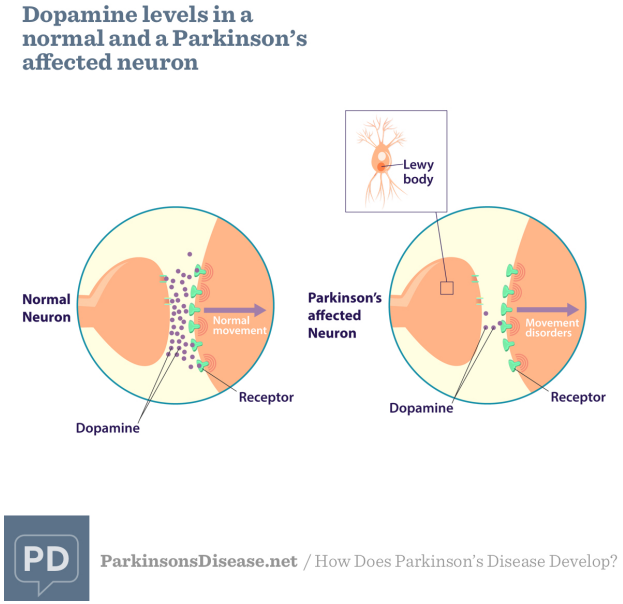


Signs & Symptoms

Symptoms may include:

- Motor symptoms
  - Tremors
  - Bradykinesia (slow movements)
  - Problems with speech
  - Muscle rigidity
- Cognitive symptoms
  - Parkinson's dementia
    - Depression
    - Sleeping disorders
    - Hallucinations
    - Paranoid delusions

Parkinson's Disease is characterized by the gradual degradation of certain neurons in the brain. Most symptoms associated with Parkinson's patients arise from the break down of neurons that produce dopamine.



References:

Parkinson's disease. (2020, August 07). Retrieved October 08, 2020, from https://www.mayoclinic.org/diseases-conditions/parkinsons-disease/symptoms-causes/syc-20376055

Bhandari, S. (2019, June 19). Dopamine: What It Is & What It Does. Retrieved October 08, 2020, from https://www.webmd.com/mental-health/what-is-dopamine

D3 PICO

- **Clinical Question:**

In a patient with Parkinsons, what clinical challenges can you expect, and how may this impact the overall treatment plan?

PICO Format

P: Patients with Parkinson's Disease interested in tooth replacement

I: fixed prostheses

C: removeable prostheses

O: more successful

PICO Formatted Question

In patients with Parkinson's disease that are interested in tooth replacement, are fixed prosthesis more successful than removeable appliances?

Clinical Bottom Line

When choosing between a fixed prosthesis or removeable appliance in patients with Parkinson's disease it ultimately is a decision based on each individual patient's specific circumstances. There is no one approach fits all with this disease.

Search Background

- **Date(s) of Search:** October 6th 2020
- **Database(s) Used: Pubmed**
- **Search Strategy/Keywords:** Parkinson's Disease, Implants, Oral Health, Removeable Prosthesis, Denture

Search Background

- **MESH terms used: Parkinson Disease, Dental Implants, Denture**

Article 1 Citation, Introduction

- Schimmel M, Srinivasan M, McKenna G, Muller F. 2018. Effect of advanced age and or systemic medical conditions on dental implant survival: A systematic review and meta-analysis. Wiley Clinical Oral Implants Research [Internet]. [cited 6 Oct 2020];29(16):311-330.
- Study Design: Systemic Review/Meta Analysis
- Study Need / Purpose: Higher level of research on implant success with systemic medical conditions. Specifically looked at section on Parkisons.

Article 1 Synopsis

- **Method** – First part of review included search criteria for all human studies reporting geriatric Individuals over 75 with dental implants for implant survival. Second part of review included a search with no age limit only most common medical conditions in the elderly.
- **Results –** 6,893 studies identified, 60 included.
- **Conclusions –** Overall implant survival rates of 97.3% and 96.1% for 1 and 5 years. Case reports and case series with a limited number of participants reported for Parkinson's disease with survival rates ranging from 82.1% to 100%.
- **Limitations –** This review looks at a wide range of medical conditions. Shows there are limited studies on specifically Parkinson's disease patients with implants ~3 studies as of 2018.

Article 1 Selection

- **Reason for selection** – high level of evidence and helped identify specific studies related to Parkinson's disease and implants.
- **Applicability to your patient** – Provides a list of studies for patients with Parkinson's disease and implants along with a range of implant success 82%-100%
- **Implications** – Shows there is limited research and studies for patients with Parkinson's disease who have implants placed, but there are cases that show implants can be successful.

Article 2 Citation, Introduction

- Packer ME. 2009. The potential benefits of dental implants on the oral health quality of life of people with Parkinson's disease. Gerondontology [internet]. [cited 6 Oct 2020];26:11-18.
- Study Design: Prospective Cohort Study
- Study Need / Purpose: Implants impact on quality of life for people with Parkinsons.

Article 2 Synopsis

- **Method** – Nine people were provided either a fixed implant prosthesis or removeable implant retained prostheses. Participants completed Dental Impact on Daily Living (DIDL) assessments prior to surgery, at 3 months after completing treatment and 12 months. This questionnaire included questions on:
  - Oral well being
  - Satisfaction with prosthesis
  - Eating
  - Impact on general life

Article 2 Synopsis

- **Results** – The implant success rate was 85% in maxilla and 81% in the mandible after stage I surgery. After stage II treatment there were no additional implant failures until the end of this study.
  - Post insertion challenges
    - 2 patients required repair/remake of overdenture
    - 2 patients reported difficulty removing overdenture
    - 2 patient had deterioration of opposing natural dentition requiring opposing dentures.
    - 4 patients had difficulty maintaining oral hygiene around the implants
    - 6 patients had gingival hyperplasia below overdenture (maybe ball retained would've been easier to clean than bar).
  - Significant improvements in oral well being, satisfaction with prosthesis, and eating at 3 months compared to pre-treatment. No significant improvements at 12 months.

Article 2 Synopsis

- **Conclusions** – Although there were challenges with implant retained overdentures the patient satisfaction and overall quality of life was improved for the short duration of this study.

- **Limitations** – There was no control group to compare against. All participants had long standing difficulties with their removeable prosthesis and were looking for an alternative solution. Small study size.

Article 2 Selection

- **Reason for selection:** I selected this article because of its study group size (one of the largest and only 9), and quality of life questionnaire.
- **Applicability to your patient:** This article applies to our patient if he were to become edentulous and wanted to consider implants as an option.
- **Implications:** Implants are a possible option for patients with Parkinsons. Better if placed early in diagnosis.

Article 3 Citation, Introduction

- Packer ME. 2015. Are dental implants the answer to tooth loss in patients with Parkinson's Disease?. Prim Dent J [internet]. [cited 6 Oct 2020];4(2):35-41.
- Study Design: Expert Opinion
- Study Need / Purpose: Follow up to article 1

Article 3 Synopsis

- **Results** – Follow up to Article 1
  - Patient 1 – After 8 years
    - Maxillary – Two-unit implant supported bridge #4-5 and two single tooth implants on the left side. #6 finally failed and a cantilever bridge was put in place.
  - Patient 2 – After 8 years
    - Maxillary complete denture and bar retained mandibular overdenture initially placed
    - Years 1-3 Mandibular overdenture fractured and lost the replacement.
    - Year 4 Maxillary denture was too loose and was replaced. Patient had significant loss of vertical height of anterior alveolar ridge.
    - Year 7 - Mandibular overdenture converted from bar retention to locator abutment. As this simpler system was felt to reduce the likelihood of further prosthesis fracture, retention clip fracture, hyperplasia beneath the bar, and hyperplasia of the lower lip mucosa due to frictional keratosis caused by dystonic lip contraction against the bar.
    - Year 8 – maxillary denture only held in place by dental springs. Should maxillary implants have been placed at the beginning of treatment?
    - Patient had trouble damaging retentive nylon inserts due to dexterity. Trained the patient's care giver to replace inserts as needed.
  - Patient 3 – After 6 years
    - Maxillary implant retained overdenture (4 implants bar retained), Mandibular dentate.
    - Years 1-2 fractured maxillary denture 2x. New denture with higher strength cast cobalt chromium.
    - Year 3 – Gold bar fractured at soldered joints from patient bruxing when not wearing the denture.
    - Year 5 – Fracture of implant fixture at canine region. Three remaining implants changed to locator.
    - Year 6 – Denture cracked and was rebased using high impact acrylic and mesh framework.
    - Learned patients can damage implants even when splinted by a bar due to parafunctional movements associated with Parkinsons.
  - Patient 4 – After 6 years
    - Maxillary dentate, Mandibular overdenture.
    - Year 3 – Replaced 3 failed implants. New Implant retained overdenture made.
    - Years 4-6 Denture replaced due to fracture of retaining clips on two occasions. Patient gradually decoronated the crowns of his natural maxillary teeth due to parafunctional movements associated with Parkinsons.

Article 3 Synopsis

- **Conclusions** – Complications from inability to maintain oral health as well as overloading from mandibular parafunction must be expected. High levels of maintenance and costs should be expected to maintain quality of life in Parkinson's patients with implants due to failures of implants, prosthesis, and components.
- **Limitations** – Only 4 of the original 9 patients were followed for more than a year.

Article 3 Selection

- **Reason for selection** – Longer timeframe of following Parkinsons patients with implants.
- **Applicability to your patient** – Shows what could be some long-term complications and risks that would be beneficial to inform the patient.
- **Implications** – There is a high potential for increased maintenance and costs associated with maintaining functioning fixed prosthesis for longer terms in patients with Parkinsons.

Article 4 Citation, Introduction

- Ribeiro GR, Campos CH, Garcia RCMR. 2017. Influence of a removable prosthesis on oral health-related quality of life and mastication in elders with Parkinson disease. Journal of Prosthetic Dentistry [Internet]. [cited 6 Oct 2020]; 118(5) 637-642.
- Study Design: Prospective Cohort Study
- Study Need / Purpose: Provides data for removeable prosthesis in patients with Parkinson's disease. An alternative to Implants.

Article 4 Synopsis

- **Method** – 34 elders 17 with and 17 without Parkinsons. Mean age of 69.4yrs and PD diagnosis of 6.8yrs. All participants first received general dental treatment. They then underwent baseline Quality of life and masticatory efficiency assessments. Each participant was given new complete or partial dentures and a 2-month adaptation period. These were made by the same prosthodontist and lab technician. Then the Quality of life and ME assessments were given again for comparison. The masticatory efficiency was measured by having the patients chew a material for a specified time and then measured the particles.

- **Results –** After the new prosthesis elders with PD showed improved Quality of life and ME. Comparing against the controls patients with Parkinsons showed similar Quality of life improvement but continued to have less masticatory efficiency compared to controls.

Article 4 Synopsis

- **Conclusions –** Removeable prosthesis is a viable option for patients with Parkinsons. We can expect an increase in the quality of life but they may not reach the same level of masticatory efficiency as patients without PD. This is due to the muscle weakness and decrease motor function associated with PD.

- **Limitations –** Quality of the alveolar ridge was not taken into consideration. This could impact the masticatory efficiency of both groups. The general dental treatment could have also influenced the quality of life assessment. This was a small sample size.

Article 4 Selection

- **Reason for selection –** Provides data and comparison of removeable prosthesis in patients with Parkinson's disease to a control group.
- **Applicability to your patient –** This article provides some evidence that a removeable prosthesis can improve the quality of life of patients with Parkinson's disease.
- **Implications –** There should be an expectation that a prosthesis will not bring a patient back to the quality of life and chewing efficiency prior to their diagnosis.

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 – I did not find any research on patients with Parkinson's comparing fixed prosthesis to removeable appliances. I was able to find research for each appliance separately. This makes the comparison between the two difficult, but we can compare the results from each study to produce pros and cons that can be presented to the patient and help them make an educated decision.
  - Patient circumstances & preferences – Cost, caregiver's ability to help with oral health care, age, current stage of the disease, clenching, bruxism, motor control.

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

- Based on the patients age, financial resources, home care and history of Parkinsons I would recommend we present the advantages and disadvantages of a removeable appliance, fixed prosthesis, or continuing to treat his remaining teeth for as long as possible. Then let our patient and his wife make an educated decision on the level of resources they want to allocate toward his overall oral health while trying to provide the best quality of life under his ever-changing circumstances.

Conclusions: D4

- Treat decay aggressively while stressing preventative measures already put in place (include wife in coaching)
- Will reassess tooth replacement if patient proves that the new restorations outlast recurrent decay
- Bottom Line – definitive treatment is dictated by severity/degeneration of disease

If Removable is Considered…

Zest Dental Chairside Denture Removal Aid

Discussion Questions

- If removable is the treatment option for a Parkinson's patient, would implant retention be recommended/required for functionality/safety?
- What methods could be used to mitigate patient tremors in order to provide safe dental care and prevent operator error?
- Does placing/removing dentures require teaching/demo for Parkinson's patients?
- Are there any drug interactions that should be noted with this patient?
- Are there any special safety precautions when treating a Parkinson's patient?
- How do Parkinson's related rigidity, tremor, and dyskinesia affect the longevity of dental appliances and restorations?
- Are morning or afternoon appointments better for Parkinson's patients?
- Is increased age a cause of xerostomia?

Discussion Questions

- Are implants contraindicated in patients with Parkinson's due to clenching?
- Which Parkinson's medications cause oral side effects such as xerostomia?
- Is there a risk of fixed prostheses breaking due to Parkinson's motor symptoms?
- What sort of oral hygiene methods should we recommend to Parkinson's patients?
- Is there anything a Parkinson's patient can do pre-appointment to improve treatment?
- Is there a stage in Parkinson's where removable appliances are contraindicated?
- Are there any new treatment regimens employed by physicians to control symptoms of patients with Parkinson's?

THANK YOU