

Complete Dentures & Ridge Resorption

Group 10B-5, 10/21/20

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Rounds Team

- ▶ **Group Leader: Dr. Yray**
- ▶ **Specialty Leader: Dr. Hjertstedt**
- ▶ **Project Team Leader: Nathan Pinsky**
- ▶ **Project Team Participants: Christian Montes; Aliyah Wilson; Michael Feeney**

Patient: *Mr. U*

- ▶ Age: 73
- ▶ Gender: Male
- ▶ Chief Complaint: “I need a new dentures”
- ▶ Mr. U has a 20+ year old maxillary denture, but has never had a mandibular denture. His remaining mandibular teeth were extracted in December of 2019.

Medical History

- ▶ Conditions:
 - ▶ High blood pressure, coronary heart disease, atrial arrhythmia, type II diabetes, remission of prostate cancer, history of renal insufficiency, osteoarthritis, high cholesterol and nerve pain in legs
- ▶ Medications:
 - ▶ Arrhythmia: warfarin
 - ▶ Hypertension: metoprolol, hydrochlorothiazide, atenolol, amlodipine, & atorvastatin
 - ▶ Type II Diabetes: glipizide
 - ▶ Nerve Pain: gabapentin
- ▶ Allergies:
 - ▶ NKDA

Dental History

- ▶ Patient visits Marquette University School of Dentistry regularly & presents with:
 - ▶ History of extractions
 - ▶ 20+ year old maxillary denture
 - ▶ **Advanced resorption of anterior mandibular residual ridge**

Radiographs

Pre-Extraction PAN from 6/18/19



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Radiographs

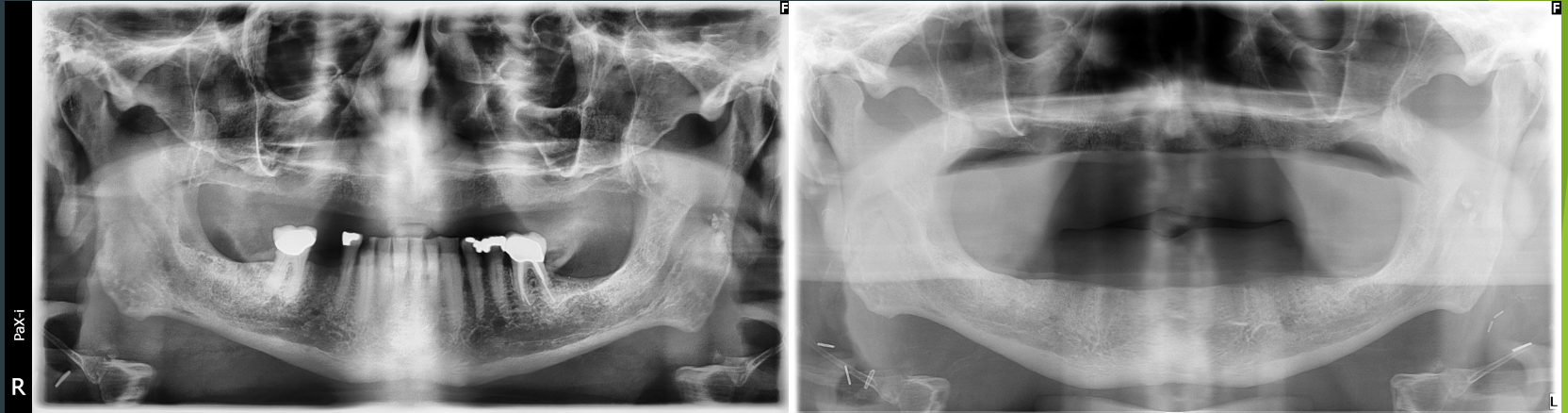
Current PAN from 9/18/20



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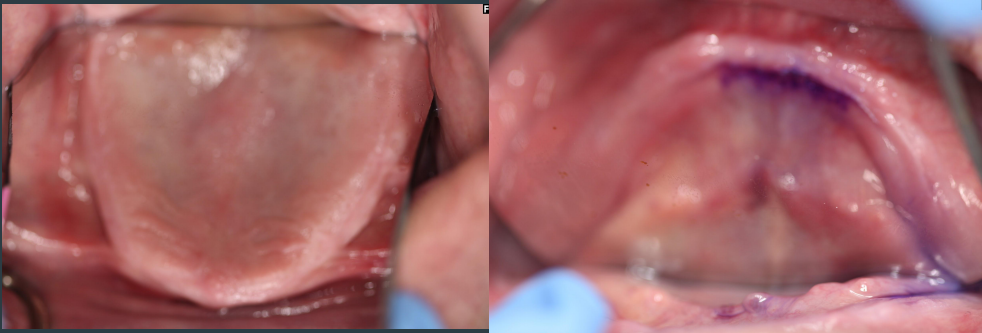
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Radiographic Findings



- ▶ Resorption is noted radiographically, but the true extent of the resorption is best seen in the clinical photos

Clinical Findings



- ▶ Clinically, the anterior mandibular ridge measures 1mm high and 3mm wide
- ▶ The posterior mandibular ridge has large, supportive buccal shelf
- ▶ Maxillary residual ridge presents with a shallow palatal arch

Odontogram

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
M	M	M												M	M
32	31	P 30	29	P 28	P 27	P 26	P 25	P 24	P 23	P 22	P 21	P 20	P 19	18	17

#19-28 & #30 were extracted at MUSoD

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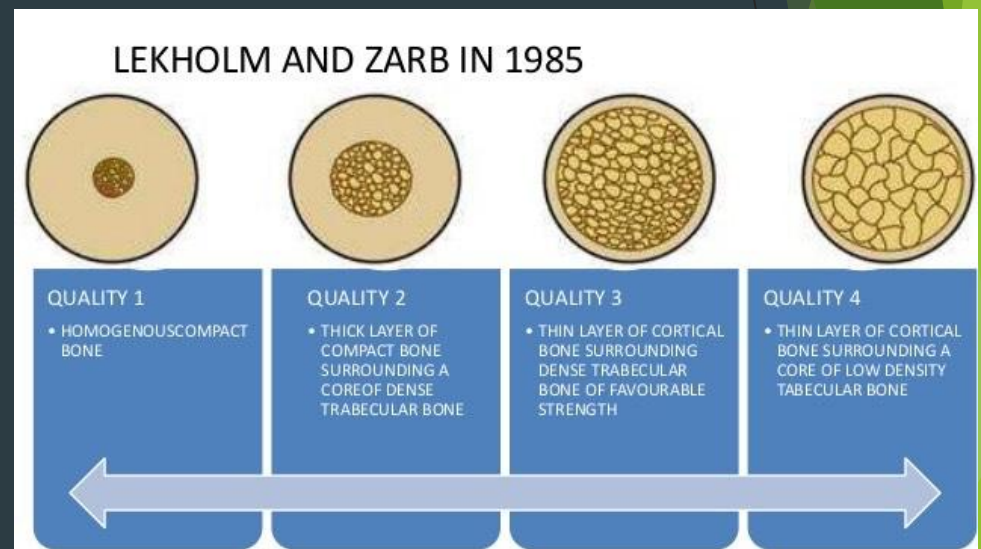
Problem List

- ▶ Denture retention
- ▶ Progression of ridge resorption with systemic disease
 - ▶ Type II Diabetes
 - ▶ Osteoarthritis

Basic Science: What is residual ridge resorption?

- ▶ Resorption of the bone in the residual ridge after tooth extraction
 - ▶ Alongside bone growth into empty socket, bone resorption and remodeling of the residual ridge via osteoclasts occurs
 - ▶ 3-4 weeks after extraction: changes in contour of the residual ridge most active
 - ▶ Most significant bone loss occurs within first 6 months...
 - ▶ However, continues slowly throughout life
- ▶ Key determinant is bone quality...

BONE DENSITY	DESCRIPTION	TACTILE ANALOGUE	TYPICAL ANATOMIC LOCATION	HOUNSFIELD UNITS
D1	Dense cortical	Oak/maple	Anterior mandible	>1250
D2	Porous cortical & coarse trabecular	White pine/spruce	Anterior and posterior mandible, anterior maxilla	850-1250
D3	Porous cortical (thin) & fine trabecular	Balsa wood	Posterior mandible, anterior and posterior maxilla	350-850
D4	Fine trabecular	Styrofoam	Posterior maxilla	150-350



D2 Pathology

- ▶ *1-2 slides (Summarizes written report in D2 Pathology Template posted in Rounds Website.)*
- ▶ *D2 Pathology Question:*
- ▶ *Discussion:*
- ▶ *Reference citation(s):*

D3 PICO

- ▶ **Clinical Question: In an edentulous patient, what brings more patient satisfaction: traditional denture or implant retained overdenture.**

PICO Format

P: Edentulous patient with bone resorption and systemic disease.

I: Implant supported overdenture on the mandibular arch.

C: Traditional denture.

O: Satisfaction with prosthesis.

PICO Formatted Question

- ▶ **Clinical Question:** In an edentulous patient, what brings more patient satisfaction: traditional denture or implant retained overdenture.

Clinical Bottom Line

Finding if Overdentures are the best solution to edentulous patients.

Search Background

- ▶ **Date(s) of Search: 10/05/2020 - 10/14/2020**
- ▶ **Database(s) Used: PubMed**
- ▶ **Search Strategy/Keywords: Overdenture/Ridge Resorption**

Search Background

► MESH terms used:

1. “Overdenture”
2. “Denture”
3. “Ridge”

Article 1

- ▶ Kroll, Philip. “Oral Health-Related Outcomes in Edentulous Patients Treated With Mandibular Implant-Retained Dentures Versus Complete Dentures: Systematic Review With Meta-Analyses.” *J Oral Implants*, 2018, pp. 313–324.
- ▶ Study Design: Systematic Review with Meta-Analysis
- ▶ Study Need / Purpose: To compare the oral-health results of dentures to implant-supported overdentures

Article 1 Synopsis

- ▶ **Methods:** Studies were randomized controlled trials that focused on how effective implant-retained overdentures and traditional dentures in comparison to each other.
- ▶ **Results:** By measuring satisfaction among patients, it was shown that there was not large differences in satisfaction
- ▶ **Conclusions:** Moderate to low evidence that implant overdentures can improve quality of life more than dentures.
- ▶ **Limitations:** Possible Bias and failures in cases that weren't accounted for

Article 1 Selection

- ▶ Chose this article because of the patient's ability to have either of these options. As far as how this will apply to the patient, it can be taken into account for starting Stage II treatment.

Article 2 Citation, Introduction

- ▶ Padmanabhan, Harini, et al. “Single Implant Retained Overdenture Treatment Protocol: A Systematic Review and Meta-Analysis.” *Journal of Prosthodontics*, vol. 29, no. 4, 2019, pp. 287–297., doi:10.1111/jopr.13133.
- ▶ Study Design: Systematic Review and Meta-Analysis
- ▶ Study Need / Purpose: To see the effects of Overdenture Treatment on the oral environment

Article 2 Synopsis

- ▶ Method: Literature research was used to see what is the most effective method of establishing favorable protocol with implant-supported overdentures.
- ▶ Results: delayed loading showed the highest survival rates, while ball abutments were the most cause of fracture.
- ▶ Conclusions: “Single implant-retained overdenture treatment is a cost-effective, minimally invasive and simple treatment that can be used to restore function and aesthetics to edentulous patients, with relatively high implant and prosthesis success rates and minimal complications.” - directly from article and needs to be phrased
- ▶ Limitations: literature only review, were not around for the actual placements

Article 2 Selection

- ▶ We chose this article due to it being the best possible outcome when planning overdenture placement.
- ▶ Applicability to your patient: if the patient will be going with the overdenture, this will be the best way to place it.
- ▶ Implications: Taking into account failure rates, the bone resorption and systemic disease must be planned for.

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

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Strength of Recommendation Taxonomy (SORT)

<input checked="" type="checkbox"/>	A – Consistent, good quality patient oriented evidence
<input type="checkbox"/>	B – Inconsistent or limited quality patient oriented evidence
<input type="checkbox"/>	C – Consensus, disease oriented evidence, usual practice, expert opinion, or case series for studies of diagnosis, treatment, prevention, or screening

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Conclusions

- ▶ 1 slide
- ▶ D3: With the evidence here, it shows that an implant supported overdenture could work well for this patient.

Conclusions (Continued...)

- ▶ Ideal Treatment Plan: Implant supported overdenture
- ▶ Alternative Treatment Plan: Traditional complete denture
- ▶ Accepted Treatment Plan: Traditional complete denture trial period, progressing to implant supported overdenture for the mandibular if patient is not satisfied with traditional denture at 2-month recall

Clinical Photo of Delivered Traditional Complete Dentures



Discussion Questions

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