

Implant Supported Prosthesis

Group 6B-4

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Hanfrey Deng, Abigail Yurs

10/21/2020

Rounds Team

- ▶ **Group Leader: Dr. Cimrmancic**
- ▶ **Specialty Leader: Dr. An**
- ▶ **Project Team Leader: D4 - Scott Sutton**
- ▶ **Project Team Participants: D1-Abigail Yurs; D2-Hanfrey Deng; D3-Lato Nguyen**

Patient Background

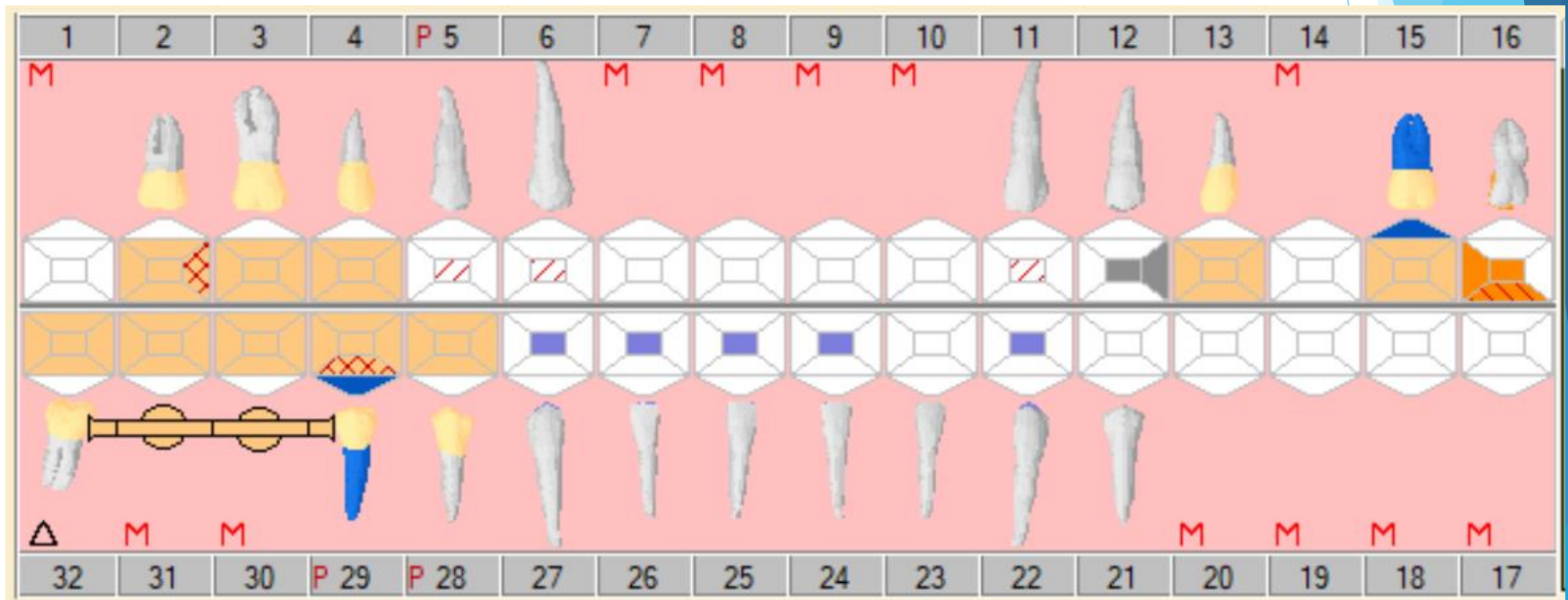
- ▶ 63 yo Caucasian Male
- ▶ CC: “Interested in implants in LL, concerned about longevity of bridge LR. Also interested in implants for upper front. I was in a car accident when I was young and have a partial but wondering if something should be done there or not”

Medical History

- ▶ MH: asthma, sleep apnea, HTN, osteoarthritis
- ▶ Meds: indomethacin, lisinopril, albuterol inhaler PRN
- ▶ NKDA

Dental History

- ▶ Caries
- ▶ Extractions
- ▶ Trauma
- ▶ Periodontal disease



Radiographs



Radiographs



▶ Radiographic Findings:

- ▶ Recurrent decay M #2
- ▶ Recurrent decay OB #29, failing bridge → hopeless prognosis indicated for EXT per perio

Perio Chart

																	MOBILITY
	P	P	P	P	P	P	P	P	P			P	P	P	P	P	FURCA
																	PLAQUE
																	BOP
	5	5	5	5	5	5	5	3	3	3	4	4	4	4	4	5	MGJ
	2	1	2	2	1	2	3	2	2	2	3	2	2	3	2	4	CAL
	2	1	2	2	1	2	3	1	2	2	2	2	1	3	2	1	P.D.
	0	0	0	0	0	0	0	1	0	0	1	0	1	1	1	0	FGM
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	FGM
	3	2	3	3	2	3	3	2	2	2	3	2	2	2	3	3	P.D.
	3	3	4	3	2	3	3	2	2	2	3	2	2	3	3	3	CAL
																	MGJ
																	BOP
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	PLAQUE
																	FURCA
																	PROGNOSI

																	PROGNOSI
P	P			P	P	P	P	P	P	P	P	P	P	P	P		FURCA
				B	B	B											PLAQUE
4	4	4		5	5	5	4	4	4	3	3	3	3	2	1	2	BOP
2	3	3		6	3	4	4	1	2	2	3	2	2	4	2	2	MGJ
2	3	3		6	3	4	4	1	2	2	1	2	2	1	2	2	CAL
0	0	0		0	0	0	0	0	0	0	2	0	0	3	0	0	P.D.
				0	0	0	0	0	0	0	2	0	0	3	0	0	FGM
32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17		
0	0	0		1	1	1	0	0	0	0	2	0	0	2	0	0	FGM
2	2	3		2	1	2	2	2	2	1	3	3	1	2	2	1	P.D.
2	2	3		3	2	3	2	2	2	2	1	3	3	2	2	3	CAL
3	3	3		4	4	4	4	4	4	4	4	4	4	4	4	4	MGJ
				B													BOP
P	P			P	P	P	P	P	P	P	P	P	P	P	P	P	PLAQUE
																	FURCA
																	MOBILITY

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Clinical Findings

- ▶ **Missing teeth:**
 - ▶ Max = #7-10, #14 (pt currently has Class III mod 1 RPD)
 - ▶ Mand = #17-20
- ▶ **Recurrent Decay:**
 - ▶ #2 M and #29 OB
- ▶ **Missing restoration:**
 - ▶ #23 I
- ▶ **Periodontal:**
 - ▶ Localized moderate chronic periodontitis
 - ▶ Class II furcation #32

Diagnosis

- ▶ Missing Teeth
- ▶ Caries
- ▶ Periodontal Disease

Problems List

- ▶ Decay
- ▶ Trauma history
- ▶ Missing teeth
- ▶ Bruxism
- ▶ Decreased VDO

D1 - What is osseointegration?

- ▶ Complete contact between bone tissue and implant
- ▶ 2-6 months for complete contact
- ▶ Necessary for stability and function
- ▶ Risk factors that contribute to failure:
 - ▶ Smoking
 - ▶ Diabetes
 - ▶ Taking certain medications



Sources

Hervas, M. (2019, March 11). What Is Osseointegration? Retrieved October 07, 2020, from <https://implantationdentalcenter.com/2019/03/11/what-is-osseointegration/>

What is Osseointegration. (2020, January 23). Retrieved October 07, 2020, from <https://dentagama.com/clinicpages/1250/what-is-osseointegration>

D2 - What is peri-implantitis

- ▶ Analogous to gingivitis progression
 - ▶ Gingivitis → Periodontitis
 - ▶ Peri-implant mucositis → Peri-implantitis
- ▶ Peri-implant mucositis
 - ▶ “a disease in which the presence of inflammation is confined to the soft tissues surrounding a dental implant with no signs of loss of supporting bone following initial bone remodeling during healing”
 - ▶ inflammation, bleeding on probing, no bone loss
- ▶ Peri-implantitis
 - ▶ “an inflammatory process around an implant, which includes both soft tissue inflammation and progressive loss of supporting bone beyond biological bone remodeling”
 - ▶ inflammation, bleeding on probing, bone loss present



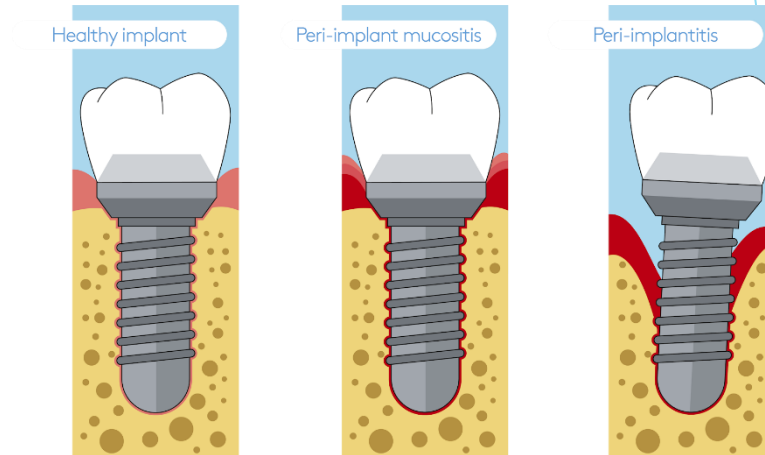
Peri-implantitis Cont.

- ▶ General Risk Factors
 - ▶ poor oral hygiene
 - ▶ periodontal disease
 - ▶ smoking
 - ▶ Diabetes
- ▶ Local Risk Factors
 - ▶ excess cement
 - ▶ lack of attached soft tissue
 - ▶ ledges on crown
 - ▶ submucosal restoration
- ▶ Etiology
 - ▶ Biofilm formation
 - ▶ Natural teeth = protective supracrestal gingival fibers → separates inflammation from bone
 - ▶ Dental implant = lacks protective supracrestal fibers → more susceptible to bone loss

Peri-implantitis Cont.

► Treatment

- Peri-implant mucositis = non-surgical periodontal therapy
- Peri-implantitis = surgical periodontal therapy



References

1. Rosen. 2013. Academy Report: Peri-Implant Mucositis and Peri-Implantitis: A Current Understanding of Their Diagnoses and Clinical Implications. *Journal of Periodontology*. 84(4):436-443

2. Peri-Implant Diseases. European Federation of Periodontology [Internet]. [Cited 2020, Oct 11]. Available from <https://www.efp.org/dental-implants/peri-implant-diseases/>

3. Peri-Implant Diseases. American Academy of Periodontology [Internet]. [Cited 2020, Oct 11]. Available from <https://www.perio.org/consumer/peri-implant-disease>

Images courtesy of other media. Source if not noted.

D3 PICO

- ▶ **Clinical Question:**

- ▶ How does an implant supported prosthesis compare to a traditional removable prosthesis for restoring this patients form and function?

PICO Format

P: Partial edentulous patients

**I: Implant supported
prosthesis**

C: Traditional RPD

**O: Better oral health-related
quality of life (OHRQoL)**

PICO Formatted Question

- ▶ In partial edentulous patients, do Implant supported prostheses provide better Oral health-related quality of life compared to traditional RPD?

Clinical Bottom Line

- ▶ Implant supported prosthesis has both short- and long-term positive effects on OHRQoL
- ▶ Traditional RPDs positively affected OHRQoL in the short term.
- ▶ However, Implant supported prosthesis showed greater short-term improvement in OHRQoL than Traditional RPD.

Search Background

- ▶ **Date(s) of Search:** 10/10/2020
- ▶ **Database(s) Used:** PubMed
- ▶ **Search Strategy/Keywords:** Traditional RPDs, Implant supported prosthesis, oral health-related quality of life, partially edentulous patients.

Search Background

- ▶ **MESH terms used: denture, partial, removable, dental implants, oral health, quality of life.**

Article 1 Introduction

- ▶ Citation: Ali Z, Baker SR, Shahrabaf S, Martin N, Vettore MV. Oral health-related quality of life after prosthodontic treatment for patients with partial edentulism: A systematic review and meta-analysis. J Prosthet Dent. 2019 Jan;121(1):59-68.e3. doi: 10.1016/j.prosdent.2018.03.003. Epub 2018 Jul 10. PMID: 30006220.
<https://pubmed.ncbi.nlm.nih.gov/30006220/>
- ▶ Study Design: systemic review & meta analysis
- ▶ Study Purpose: examine the OHRQoL of patients with partial edentulism after different dental prosthetic treatments.

Synopsis

► Methods

- Electronic database and manual searches were conducted to identify cohort studies and clinical trials by 2 independently reviewers.
- Criteria = individuals receiving implant-supported crowns (ISCs), implant-supported fixed dental prostheses (IFDPs), implant-supported removable dental prostheses (IRDPs), tooth-supported fixed dental prostheses (TFDPs), and removable partial dentures (RPDs).
- Sample size = 2147 identified studies
- Met inclusion criteria:
 - 2 randomized controlled trials
 - 21 cohort studies

Synopsis cont.

▶ Results

- ▶ Pooled mean OHRQoL change ≤ 9 months
 - ▶ 15.3 for TFDP, 11.9 for RPD, 14.9 for IFDP
- ▶ Pooled standardized mean change OHRQoL change > 9 months
 - ▶ 13.2 for TFDP, 15.8 for IFDP

▶ Conclusions

- ▶ Direct comparisons ≤ 9 months between TFDP against IFDP and RPD against IFDP significantly **favor** IFDP in both cases.

▶ Limitations & Bias

- ▶ Studies were of low or moderate risk of bias

Article 1 Selection

- ▶ Reason for selection
 - ▶ Random-effects models were used to compare OHRQoL change scores
 - ▶ 95% confidence intervals
 - ▶ Oral health-related quality of life (OHRQoL)
 - ▶ informed consent vs. other criteria (cannot be quantified)
 - ▶ psychosocial, functional, and esthetic effects

Levels of Evidence

META-ANALYSIS & SYSTEMIC

- ☐ **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

Article 2 Introduction

- ▶ Citation: Nogawa T, Takayama Y, Ishida K, Yokoyama A. Comparison of Treatment Outcomes in Partially Edentulous Patients with Implant-Supported Fixed Protheses and Removable Partial Dentures. Int J Oral Maxillofac Implants. 2016 Nov/Dec;31(6):1376-1383. doi: 10.11607/jomi.4605. PMID: 27861664.
<https://pubmed.ncbi.nlm.nih.gov/27861664/>
- ▶ Study Design: Comparative Study
- ▶ Study Purpose: compare different criterias such as masticatory performance, occlusal force, and **oral health-related quality of life (OHRQoL)** in patients with implant-supported fixed protheses (ISFPs) and those with removable partial dentures (RPDs)

Synopsis

▶ Method

- ▶ Masticatory performance evaluated based on the glucose extracted from chewed gummy jelly.
- ▶ Occlusal force was measured with a pressure-sensitive sheet, and data were subjected to computer analysis.
- ▶ The Japanese version of the Oral Health Impact Profile (OHIP-J) was used to evaluate OHRQoL.
- ▶ All scores compared using the Wilcoxon rank-sum test.

▶ Results

- ▶ Nineteen patients with ISFPs and 25 patients with RPDs. No significant difference between the two groups with regard to masticatory performance and occlusal force. The OHIP-J score was significantly lower in the ISFP group than in the RPD group.

▶ Limitation:

- ▶ Mandibular distal-extension edentulism
- ▶ Masticatory performance is subjective measurement

▶ Conclusions

- ▶ Difference in masticatory performance and occlusal force between ISFPs and RPDs is small, but ISFPs are superior to RPDs with regard to OHRQoL in patients with mandibular distal-extension edentulism.

Article 2 Selection

- ▶ Reason for selection
 - ▶ Direct comparison between implant supported prosthesis vs. traditional RPDs.

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
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Article 3 Introduction

- ▶ Citation: Swelem AA, Gurevich KG, Fabrikant EG, Hassan MH, Aqou S. Oral health-related quality of life in partially edentulous patients treated with removable, fixed, fixed-removable, and implant-supported prostheses. Int J Prosthodont. 2014 Jul-Aug;27(4):338-47. doi: 10.11607/ijp.3692. PMID: 25010877. <https://pubmed.ncbi.nlm.nih.gov/25010877/>
- ▶ Study Design: Comparative Study
- ▶ Study Purpose: changes in oral health-related quality of life (OHRQoL) in partially edentulous patients treated with removable dental prostheses (RDPs), fixed dental prostheses (FDPs), fixed-removable (combined) restorations (COMBs), and implant-supported fixed prostheses (ISFPs).

Synopsis

- ▶ Method
 - ▶ 200 patients (30 to 50 years old) were enrolled: 45 received RDPs, 32 received FDPs, 66 received COMBs, and 57 received ISFPs.
 - ▶ OHRQoL was measured using the shortened version of the Oral Health Impact Profile (OHIP-14) before treatment and 6 weeks and 6 months after treatment
- ▶ Results
 - ▶ Significant decrease in OHIP scores throughout the study in all groups except the younger age group treated with RDPs after 6 weeks.
 - ▶ The least amount of OHRQoL improvement was recorded for RDPs for both age groups at 6 weeks and for the younger age group at 6 months
- ▶ Conclusions
 - ▶ All treatments produced significant improvement in OHRQoL. The least amount of improvement was observed in patients with RDPs
- ▶ Limitations
 - ▶ Sex-neutral; significant differences were found relative to age and Kennedy classification

Article 3 Selection

- ▶ Reason for selection
 - ▶ Direct comparisons of partial edentulous patients with various types of prosthesis.

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
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Conclusions: D3

- ▶ Implant supported prosthesis provides both short-term and long-term outcome if they were planned and done correctly.
- ▶ Traditional RPD would be a good short-term choice if patient has financial limitation.
- ▶ Advise to D4 regarding this patient:
 - ▶ Implant supported prosthesis if patient is a good candidate and has no financial limitation.

Conclusions: D4

- ▶ Implant supported prosthesis provide a higher long-term OHRQoL compared to a traditional removeable prosthesis in the partially edentulous patient
- ▶ Further discussion with patient = implant supported-bridges to replace LL and, eventually, LR
- ▶ Referred to Grad Prosth for pending treatment

Discussion Questions

- ▶ “What criteria are used to determine whether a patient should have an implant supported prosthesis vs a traditional prosthesis?”
- ▶ “When do you decide to do an implant supported partial denture vs 3-4 implant supported bridges?”
- ▶ “What is the cost difference between an implant supported prosthesis and traditional RPD?”