A Professional Courtesy of:



James A. Oshetski, D.D.S.

Diplomate, American Board of Oral Implantology/Implant Dentistry

14 Maine Street, Brunswick ME 04011 207-729-1159 • Fax: 207-721-0792 Email: droshetski@gmail.com www.droshetski.com





Implant Options for the Partially Edentulous Patient

Many therapeutic implant options exist for the partially edentulous patient, but little evidence is available to recommend one option over another. This issue of Report on Prosthodontics reviews the current literature to compare outcomes for implant-supported fixed and removable prosthetic treatment for the partially edentulous patient.

OHRQoL for Implant-supported Fixed Prostheses vs Removable Partial Dentures

entists often evaluate treatment outcomes based on objective variables such as masticatory function; patients often view success as an improvement in comfort and psychological well-being. Studies of edentulous patients have examined the oral healthrelated quality of life (OHRQoL) in patients with conventional dentures vs implant-supported dentures. Few studies have examined OHRQoL of partially edentulous patients, who have a wider variety of treatment options related to conventional and implant prostheses.

Furuyama et al from Showa University, Japan, conducted a cross-sectional study that compared OHRQoL outcomes in a consecutive group of patients treated with either implant-supported fixed dentures (ISFDs) or removable partial dentures (RPDs). To be included, participants had to have

- $\blacksquare \ge 1$ upper and lower teeth in each arch
- past treatment with at least 1 month's usage of an ISFD or RPD without need for adjustment

Patients were excluded if they reported pain in the orofacial region not associated with their prosthesis, presented with acute disease, or had a coexisting ISFD and RPD. The eligible 188 patients completed the Oral Health Impact Profile–Japanese version survey.

Inside this issue:

- Effect of Implant-based Prostheses on Partially Edentulous Patients
- Change in Quality of Life Based on Prosthesis Type
- Outcomes for Different Treatments in Partially Edentulous Patients

Autumn 2017



The average age and number of missing teeth were significantly higher for the RPD group than for the ISFD group (p < .001). Patients with ISFDs had better OHRQoL scores than did those wearing an RPD. The average scores of all domains and the summary scores were significantly better for ISFDs.

Because this was a cross-sectional study, there were no baseline scores; thus, no comparisons regarding improvements in OHRQoL based on prostheses type may be drawn. However, the overall impression suggested that an ISFD was more likely to promote a patient's OHRQoL.

Furuyama C, Takaba M, Inukai M, et al. Oral health-related quality of life in patients treated by implant-supported fixed dentures and removable partial dentures. Clin Oral Implants Res 2012;23:958-962.

Effect of Implant-based Prostheses on Partially Edentulous Patients

hen making decisions regarding the best treatment modality for a patient, clinicians need reliable data regarding both the functional and quality-of-life indications of various prosthetic treatment options. In a prospective, unblinded clinical trial, Gonçalves et al from the University of Campinas, Brazil, examined participants' swallowing threshold, nutritional intake and oral health–related quality of life (OHR QoL). Their study used a paired controlled design to evaluate individuals at baseline wearing an implant-supported removable partial denture (IRPD) and then again at 2 months after placement of an implant-supported fixed partial denture (IFPD).

Patients had already participated in a previous study in which they received IRPDs placed over 2 to 3 implants bilaterally in the posterior mandible. The patients had no teeth in the maxilla and only canines and incisors in the mandible. Patients included in this study had to have achieved successful osseointegration of all implants and to have worn a maxillary complete denture and the IRPD for at least 2 months without complaint. Participants with periodontal disease, a history of temporomandibular disorders or parafunctional habits were excluded from the study,

Table 1.OHIP-49 mean scores \pm SD with IRPD and IFPD use				
	IRPDs Mean ± SD	IFPDs Mean ± SD	<i>p</i> value	
OHIP-49 summary score	11.7 ± 8.8	4.8 ± 2.3	.04	
Functional limitation	5.6 ± 4.1	3.1 ± 1.4	.11	
Physical pain	2.9 ± 2.4	1.0 ± 1.4	.02	
Psychological discomfort	0.9 ± 1.9	0.2 ± 0.5	.31	
Physical disability	1.4 ± 3.0	0.3 ± 0.7	.32	
Psychological disability	0.2 ± 0.6	0.0 ± 0.0	.30	
Social disability	0.1 ± 0.4	0.2 ± 0.6	.76	
Handicap	0.1 ± 0.4	0.0 ± 0.0	.39	
Repeated-measures 1-way ANOVA, p < .05. SD, standard deviation.				

leaving 12 participants; a power analysis showed that 9 participants would be sufficient to reflect significant differences.

Bilateral 3-unit IFPDs were constructed in metal–ceramic and screwed into place. After 2 months' use, the patients' swallowing thresholds were evaluated by sieving chewable artificial test material, weighing the comminuted particles and calculating the median particle size. The analysis of variance (ANOVA) showed a significant reduction in both particle size and number of chewing cycles needed after patients received the IFPDs, resulting in more efficient mastication for all patients compared to the results with the IRPDs.

Dietary diaries and body mass indices were evaluated to assess nutritional intake. Without specific dietary instructions given, patients were asked to record their food and beverage intake for 3 days. Nutritional intake was calculated and analyzed. After use of the IFPD, patients

- increased consumption of foods rich in calcium, fiber and iron (p < .05)
- decreased intake of high-cholesterol foods (p = .02)

No differences with respect to body mass index and calories, protein, fat and carbohydrate intake (p > .05) were found between IRPD and IFPD use. Using the Oral Health Impact Profile (OHIP)-49 survey, patients rated the frequency with which they experienced the impact of items in the various OHRQoL domains.

With the IFPD, the average summary score and physical pain domain scores significantly improved. There were no significant differences in results between treatments for the other OHIP-49 domains (Table 1). Compared with the IRPD, the IFPD improved masticatory function and nutritional intake. OHRQoL was better with the IFPD than with the IRPD.

Gonçalves TMSV, Campos CH, Garcia RCMR. Effects of implantbased prostheses on mastication, nutritional intake, and oral health– related quality of life in partially edentulous patients: a paired clinical trial. Int J Oral Maxillofac Implants 2015;30:391-396.

Change in Quality of Life Based on Prosthesis Type

any treatment options are available for the partially edentulous patient. Patients and clinicians define success differently; however, outcome measures for prostheses are often based on technical standards. Thus, the use of patient-centered outcomes, such as oral health–related quality of life (OHRQoL), may be more appropriate to determine prosthetic success.

Swelem et al from King Abdulaziz University, Saudi Arabia, investigated the changes in OHRQoL of partially edentulous patients treated with 1 of 4 types of prosthesis:

- removable dental prosthesis (RDP)
- fixed dental prosthesis (FDP)
- combined fixed-removable restoration (COMB)
- implant-supported fixed prosthesis (ISFP)

Patients were included in the study if they had ≥ 1 missing teeth, good general health, no temporomandibular disorders or parafunctional habits, and the ability to read and write in Russian. Patients receiving ISFPs had to be free from any systemic disease that would compromise implant therapy and have adequate bone volume in which to place an implant without bone augmentation. Exclusion criteria included having acute oral disease, pain in the orofacial region, psychological or psychiatric conditions, or learning difficulties.

Based on the patients' selection of treatment, 200 participants (100 men, 100 women) were divided into 4 groups:

RDP (n = 45)

■ FDP (*n* = 32)

- **COMB** (n = 66)
- $\blacksquare ISFP (n = 57)$

Patients were evaluated using the Russian version of the Oral Health Impact Profile (OHIP)-14 survey. The questionnaire was administered before treatment, and 6 weeks and 6 months after treatment.

There were significant differences in terms of age (ranges, 30–40 years and 40–50 years) and Kennedy classification among the treatment groups, but no differences by sex. Pretreatment analysis revealed psychological discomfort had the greatest negative impact on OHRQoL; functional limitations had the smallest effect. OHIP-14 summary scores demonstrated a significantly better OHRQoL in all groups throughout the study; the improvement was more evident in the first 6 weeks. All posttreatment summary scores were worse in the RDP group than in the other treatment groups. Overall OHRQoL actually decreased after 6 weeks among younger patients treated with RDPs.

Comparisons revealed that the worst OHRQoL was recorded in the RDP group in nearly all domains. COMB treatment was significantly different from RDP and FDP treatments in older patients; there was no significant difference between FDPs and ISFPs. Younger Kennedy class III and IV patients' OHRQoL improved the most with FDPs and ISFPs; older patients' OHRQoL improved the most with COMBs and ISFPs. For Kennedy class I and II, younger patients had better OHRQoL with ISFPs than with RDPs; it was the reverse in the older groups.

This study illustrated that, while all prosthodontic treatments produced significant improvement at the end of the 6-month follow-up period, patients who received RDPs showed the least amount of improvement. Changes in OHRQoL in patients treated with FDPs and ISFPs were comparable. It is interesting to note that the same prosthetic treatment can have a different impact on the OHRQoL of partially edentulous patients, depending on the patient's age and Kennedy classification.

Swelem AA, Gurevich KG, Fabrikant EG, et al. Oral health–related quality of life in partially edentulous patients treated with removable, fixed, fixed-removable, and implant-supported prostheses. Int J Prosthodont 2014;27:338-347.



Outcomes for Different Treatments in Partially Edentulous Patients

ew studies have compared implant-supported fixed prostheses (ISFPs) with removable partial dentures (RPDs) or examined objective functional outcomes of treatment. Nogawa et al from Hokkaido University, Japan, compared masticatory performance, occlusal force and oral health–related quality of life (OHRQoL) in mandibular patients classified as Kennedy class I or II who had been treated with ISFPs and RPDs.

Participants (age range, 40–70 years) had partially edentulous mandibular arches of Kennedy class I or II with no modification or with all edentulous spaces restored with fixed prostheses, and had received a mandibular ISFP or RPD >6 months prior to the study; all were required to have a full maxillary arch or a maxillary arch restored with fixed prostheses. Patients with severe periodontal disease, temporomandibular disease, orofacial pain, xerostomia, RPDs with remaining teeth under the denture base or retainers other than clasps, or prosthodontic treatment with both RPDs and ISFPs were excluded.

To evaluate masticatory performance, patients chewed gummy jelly unilaterally for 20 seconds; the filtrate was collected, and the glucose concentration measured. Occlusal force was assessed with a pressure-sensitive sheet. Patients completed both tests $3 \times$ each; the mean measurement was used for analysis.

There was no significant difference between the ISFP and RPD groups in masticatory performance and occlusal force. However, for Kennedy class I patients, the occlusal force was significantly greater in the ISFP group than in the RPD group, a difference not seen in patients with Kennedy class II arches. Interestingly, the Kennedy class II patients with ISFPs showed no difference in occlusal force and masticatory performance between the natural dentition side and the prosthesis side. For patients restored with an RPD on the unilateral side, the difference between the restored side and the natural dentition for masticatory performance was significant.

OHRQoL was measured using the Japanese version of the Oral Health Impact Profile (OHIP-J), in which lower

Table 2. OHIP-J mean scores \pm SD with ISFP and RPD use				
	ISFPs	RPDs	р	
	Mean ± SD	Mean ± SD	value ^a	
OHIP-J summary score	15.3 ± 19.6	39.3 ± 25.9	<.001	
Functional limitation	4.5 ± 4.1	9.0 ± 4.9	.001	
Physical pain	2.6 ± 4.2	7.3 ± 4.2	.001	
Psychological discomfort	1.6 ± 2.3	4.0 ± 3.6	.006	
Physical disability	2.3 ± 3.2	6.4 ± 4.5	<.001	
Psychological disability	1.1 ± 2.2	3.0 ± 3.3	.020	
Social disability	0.5 ± 1.6	2.1 ± 2.5	.011	
Handicap	0.9 ± 2.0	2.9 ± 3.3	.012	
Additional Japanese items	1.8 ± 2.4	4.4 ± 2.9	.004	
^a Wilcoxon rank sum test. SD, standard deviation.				

scores indicate a higher OHRQoL. Summary and all subdomain scores were significantly lower in the ISFP group (Table 2). There was no significant correlation with regard to sex, age, number of teeth in the partially edentulous space or masticatory performance, but a multivariate logistic regression analysis showed that younger age, RPDs and lower occlusal force were significantly associated with a higher OHIP-J summary score, indicating a lower OHRQoL.

Prosthesis type influenced OHRQoL more than it influenced masticatory performance and occlusal force. This suggested that psychological and social factors influence OHRQoL more than the recovery of oral function.

Nogawa T, Takayama Y, Ishida K, Yokoyama A. Comparison of treatment outcomes in partially edentulous patients with implantsupported fixed prostheses and removable partial dentures. Int J Oral Maxillofac Implants 2016;31:1376-1383.

In the Next Issue:

- Impact of implant angulation on the retention of overdenture attachments
- Effect of implant inclination on attachment retention
- Influence of inclined implants on overdenture dislodgement

Do you or your staff have any questions or comments about **Report on Prosthodontics**? Please call or write our office. We would be happy to hear from you. ©2017