Treatment with Double Crown–Retained Removable Partial Dentures and Oral Health–Related Quality of Life in Middle- and High-Aged Patients

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The objective of this study was to assess the change in oral health–related quality of life following treatment with double crown–retained removable partial dentures (RPDs). Sixty RPDs in 54 patients (mean age: 65 years) were fabricated and retained with either galvanoformed telescopic secondary crowns (n = 30) or conical secondary crowns (n = 30). The Oral Health Impact Profile (OHIP) was assessed pretreatment and during 6- and 12-month follow-up appointments. Patient assessment of denture-satisfaction was also recorded on a Lickert-type scale. A decrease in the OHIP-sum score was significant after treatment for both groups, but not between the experimental groups. The denture assessment showed good values for both groups. Treatment with different double crown–retained RPDs improved oral health–related quality of life. *Int J Prosthdont 2007;20:576–578.*

Removable partial dentures (RPDs) are an important treatment option for rehabilitation of partially edentulous patients. An effective type of retainer for RPDs is a double-crown system, which can be designed with either telescopic or conical crowns. With conical crowns, retention is achieved via wedging between the crowns. Galvanoformed telescopic double crowns, on the other hand, use hydraulic adhesion.

Along with clinical performance, self-perceived oral health–related quality of life (OHRQoL) is a major outcome factor of prosthodontic treatment.[1] The aim of this study was to evaluate the change in OHRQoL following treatment with double crown–retained RPDs and the influence of various technical retention designs.

Materials and Methods

The study was approved by the local university ethics committee, and all patients received written information and signed an informed consent form. Fifty-four patients (mean age: 64.6 years, SD: 9; 63.3% male) requesting RPDs were randomly assigned to 1 of 2 study groups (2 to 6 abutment teeth). In one group, the secondary crowns of the dentures were made using a galvanoforming technique with 0-degree milling of the primary crown (GF-RPD); in the other group, secondary crowns with a conical design with 6-degree milling of the primary crown were used (C-RPD). Six participants received treatment with RPDs in both arches, which resulted in fabrication of a total of 60 RPDs (30 per group). Thirty dentures (15 in each group) were provided by students under supervision of clinicians. The remaining dentures were provided by clinicians. During the 6- and 12-month recalls, 57 and 53 RPDs were reevaluated, respectively.

The OHRQoL was measured using the Oral Health Impact Profile (OHIP)[2] before treatment (t_0) and 6 (t_1) and 12 months (t_2) after insertion. A simple summary score (OHIP-sum) with a range from 0, indicating good self-perceived oral health, to 212 was calculated. During the 12-month follow-up examination, the patients were asked to assess overall function, retention, and esthetics of their dentures using a Likert-type scale ranging from 1 (very bad) to 10 (very good).

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Table 1 Homogeneity of Treatment Groups

	Group		Statistical test	P
	C-RPD	GF-RPD		
Age (y)	65.5 (SD: 8.9)	63.6 (SD: 9.1)	T	.37
Gender	50% male	77% male	Chi-square	.03
Dental status				
Interim prosthesis	36.7%	46.7%		
RPD	49.9%	36.6%	U	.62
FPD	13.4%	16.7%		
Restored arch				
Maxilla	56.7%	56.7%	Chi-square	1.00
Mandible	43.3%	43.3%		
No. of abutment teeth	3.7 (SD: 1.1)	3.5 (SD: 1.3)	U	.38
Distribution of abutment teeth				
Incisors	57.1%	66.7%		
Premolars	26.8%	27.6%	U	.07
Molars	16.1%	5.7%		
Denture design without connector	16.7%	20.0%	Chi-square	.74
OHIP sum score t_0				
25% quartile	16.8	22.8		
Median	34.5	57.5	U	.10
75% quartile	67.8	114.8		

C-RPD = removable partial denture with conical secondary crowns; GF-RPD = removable partial denture with galvanoformed secondary crowns; FPD = fixed partial denture.

Table 2 Multilevel Mixed Model

Effect	Estimate	SE	df	t	P > t
Level: pretreatment	35.86	27.07	56	1.32	.191
Slope: recall ($t_0 - t_2$)	−16.11	5.44	55	−2.96	.005
Group: double-crown system	16.06	11.00	53	1.46	.150
Interaction: recall ($t_0 - t_2$) × double-crown system	−8.55	7.71	53	−1.11	.273
Age	0.15	0.40	53	0.37	.716
Gender	−4.82	7.74	53	−0.62	.536

Statistical Analysis

The homogeneity of the experimental groups was tested. Box-plot diagrams were performed for OHIP-sum scores at t_0, t_1, and t_2. Differences between OHIP-sum and self-assessment of the denture between the treatment groups for t_0 and t_1/t_2 were assessed using the Mann-Whitney U test. The Wilcoxon test for paired samples was calculated for the OHIP-sums t_0 and t_1/t_2 within groups.

The effect of different types of attachment on OHIP-sum from t_0 to t_2 was investigated using a mixed model (ie, growth-curve model).[3] The model takes into account differences between OHIP-sums at t_0, age, and gender.

Results

With the exception of gender there were no significant differences in homogeneity between the treatment groups (Table 1). The difference in OHIP between t_0 and t_1/t_2 was significant ($P < .01$), indicating better OHRQoL after treatment (Fig 1). The difference between the groups was not significant at any time. With the exception of assessment of overall denture function in the GF-RPD group, all other ratings had a median of 10, indicating a very high satisfaction of patients in both groups. Nevertheless, patients in the GF-RPD group rated the retention ($P = .04$) and esthetic appearance ($P = .015$) of the dentures significantly lower (Fig 2). The mixed-model revealed that only the fixed slope effect,
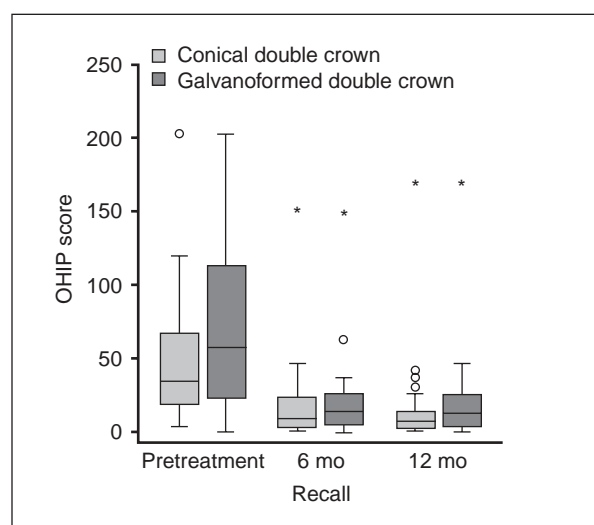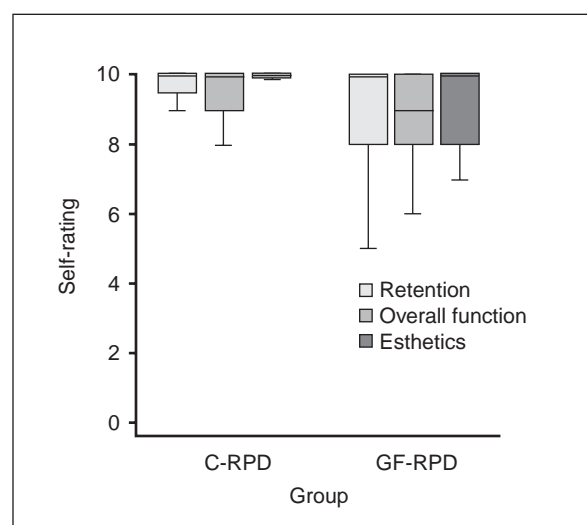
Fig 1 OHIP-sum from t_0 to t_2.

Fig 2 Self-rating of retention, overall function, and esthetics.

ie, the average rate of change across the repeated measures of OHIP (t_0 to t_2), was significant in the final model (Table 2). The treatment group × slope interaction was not statistically significant, meaning there was no significant difference between the different treatment groups concerning the change in OHIP-sum values across the repeated measurements. Subjects with a high OHIP-sum score at t_0 were also those who lost the most from t_1 to t_2.

Discussion and Conclusions

Treatment with RPDs improved OHRQoL in both groups, which confirms the results of a case series observing a decline of 26 units in the median OHIP after treatment with RPDs.[4] Other studies, however, found prosthetic treatment had a smaller effect on OHRQoL, which may be because of the sample characteristics used.[5]

A difference between the treatment options could not be observed. Treatment planning should be based on objective factors, including not only solid evidence for clinical performance, but also patient satisfaction and OHRQoL. Within the limitations of this study, both treatment options seem justified concerning patient satisfaction and OHRQoL. Future studies are suggested to compare these treatment options with simple clasp-retained RPDs.

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