Problems Reported by Patients Before and After Prosthodontic Treatment

András G. Szentpétery, DDS, PhD[a]/Mike T. John, DDS, PhD, MPH, PhD[b]/Gary D. Slade, BDSc, DDPH, PhD[c]/Jürgen M. Setz, DDS, PhD[d]

Purpose: This study sought to investigate problems reported by patients before and after prosthodontic treatment. ***Materials and Methods:*** Patient-reported problems were studied using the item list contained in the German version of the Oral Health Impact Profile in a convenience sample of 107 prosthodontic patients before (T_0), 1 month after (T_1), and 6 to 12 months after treatment (T_2). "Frequently reported" problems were defined as impacts experienced fairly often or very often. The prevalence of frequently reported problems was compared among treatment groups and across appointments. ***Results:*** At baseline, the most prevalent frequently reported problems were "difficulty chewing" (31%), "take longer to complete a meal" (28%), "food catching" (26%), "uncomfortable to eat" (24%), and "unable to eat (because of dentures)" (23%). At T_2, the most prevalent frequently reported problems were "sore spots" (5%), "painful gums" (4%), "discomfort (because of dentures)" (3%), and "sore jaw" (2%). The number of reported problems decreased from 18.0 (T_0) to 7.5 (T_1), and further to 4.5 (T_2). The decrease was the fastest in fixed partial denture wearers and the slowest in removable partial denture wearers. Some problems emerged during or after prosthodontic treatment. The kind of pre- and posttreatment problems differed substantially. ***Conclusion:*** The number of problems decreased substantially after prosthodontic treatment. Fixed partial dentures more effectively influenced the problems reported before treatment than did removable partial or complete dentures. *Int J Prosthodont 2005;18:124–130.*

Patients mostly seek prosthodontic treatment because of symptoms of orofacial disease, missing teeth, or problems related to their current dentures. They expect that these symptoms will decrease or even disappear during the course of prosthodontic treatment.

Orofacial pain, functional limitations, psychosocial impacts, and concern about appearance are all dimensions of oral health–related quality of life (OHRQoL).[1] Consequently, OHRQoL is especially important for prosthodontics. OHRQoL is assessed by multiple-item questionnaires that ask about numerous symptoms, problems, and psychosocial impacts. A summary score is created by combining the item responses into an index. Some questionnaires group items into separate dimensions of OHRQoL that are more related to each other than to other items in the questionnaire. For example, one widely used OHRQoL questionnaire, the Oral Health Impact Profile (OHIP), groups 49 items into seven dimensions.[2] While summary scores are useful for tracking changes in OHRQoL for groups of patients, there is additional interest in responses to

[a]*Associate Professor, Department of Prosthodontics, Martin Luther University Dental School, Halle/Saale, Germany.*
[b]*Assistant Professor, Department of Prosthodontics and Material Science, University of Leipzig, Germany; and Affiliate Assistant Professor, Department of Oral Medicine, University of Washington, Seattle.*
[c]*Professor of Oral Epidemiology, Australian Research Centre for Population Oral Health, University of Adelaide Dental School.*
[d]*Professor, Department of Prosthodontics, Martin Luther University Halle-Wittenberg, Halle/Saale, Germany.*

Correspondence to: *Dr András G. Szentpétery, Department of Prosthodontics, Martin Luther University Dental School, Große Steinstraße 19, Halle/Saale D-06108, Germany. Fax: + 49 345 557 3779. e-mail: andras.szentpetery@medizin.uni-halle.de*

This material was presented in part as a poster at the annual meeting of the International Association for Dental Research, 10–13 March 2004, Honolulu.

single questions that potentially convey important information relevant for diagnosis, prognosis, and assessing effectiveness of treatment in prosthodontics.

Several OHRQoL instruments exist (for a review, see Slade et al[3]). Among them, OHIP is widely used in population-based studies[4–6] and clinical research.[7–11] It is well-suited to characterize problems and symptoms of patients in prosthodontic treatment because:

1. Items in the questionnaire were developed from interviews with patients of a dental clinic and a dental practice in Australia,[2] and those items were subsequently verified in a group of prosthodontic patients in Germany,[12] ensuring that problems relevant for prosthodontic patients are comprehensively captured with the questionnaire.
2. Psychometric properties of the instrument are well-known and considered sufficient to capture underlying construct of OHRQoL ([2,12–14]; John MT, et al, unpublished data, 2004).
3. OHIP questions specifically ask about "problems with your teeth, mouth or dentures," and therefore include denture-related problems and symptoms.
4. OHIP is the longest among OHRQoL instruments (for a review of instruments, see Slade et al[3]), and it therefore represents the most comprehensive questionnaire able to measure patients' problems and symptoms.
5. OHIP is a standardized, internationally accepted instrument with several language versions (eg, English,[2] German,[12] Chinese,[14] Swedish,[15] Sinhalese[16]).

Although OHRQoL has been studied in the field of prosthodontics,[8,9,11,17–19] published results have focused on summary scores and OHIP dimension scores, but not on individual problems of patients. There are only a few publications concerning the frequency of problems in denture wearers. In a population-based study, Frank et al[20] investigated patient satisfaction after insertion of mandibular removable partial dentures (RPD). The most frequent areas of dissatisfaction concerning the new dentures were fit, eating/chewing, mouth cleanliness, speech, appearance, cleanliness, and odor. They concluded that the majority of the responders were satisfied with the new prosthesis. Dissatisfaction with an RPD was attributed to factors that were only indirectly related to the denture itself, such as patient age, health status, prior experience with dentures, and type of opposing dentition.

Redford et al[21] studied problems of complete denture (CD) wearers on the basis of clinical technical quality; 60% of denture users had at least one problem with their denture. Lack of stability was the problem noted overwhelmingly for RPDs, but CDs were equally affected by a lack of stability and retention. An opinion survey found that the most frequent problems concerning adaptation to denture wearing among new denture wearers were food catching, cleaning difficulties, soreness or pain, poor retention, and appearance.[22] On average, 6.4 problems were reported shortly after denture insertion, and 2.5 problems were reported 2 months after insertion.

It was the aim of this study to investigate the frequency of problems and symptoms reported by patients before and after prosthodontic treatment, using the OHIP questionnaire to measure those problems and symptoms.

Materials and Methods

Subjects

The authors selected a convenience sample of 107 adult patients aged 24 to 82 years (mean age 56.3 ± 14.6 years; 56% women) who sought prosthodontic treatment. The sample included 42 patients treated with fixed partial dentures (FPD) (25 patients treated with crowns alone, and 17 patients treated with FPDs and crowns; mean age 43.8 ± 12.5 years; 52% women), 31 patients with RPDs (17 telescopic crown–retained dentures, 13 clasp-retained cast-frame prostheses, and 1 wire clasp–retained RPD; mean age 60.5 ± 9.4 years; 61% women), and 34 patients with CDs in both jaws (mean age 68.1 ± 7.1 years; 56% women). Patients were recruited from the Department of Prosthodontics, Martin Luther University, Halle-Wittenberg, Germany, and from a dental practice. Verbal informed consent was obtained from all participants. The institutional review board in charge approved the study.

Problems Reported Before and After Prosthodontic Treatment

Problems and symptoms were measured using OHIP-G, the German version of OHIP (53 questions indicating problems and symptoms).[12] OHIP-G has 49 items derived from the English-language OHIP[2] and 4 items specific for the German population. For each OHIP question, subjects were asked how frequently they had experienced the impact in the last month. Patients were given the OHIP-G questionnaire to complete before treatment (T_0), 1 month after treatment (T_1), and 6 to 12 months after treatment was finished (T_2). Responses were made on a five-grade Likert-type scale: 0 = never; 1 = hardly ever; 2 = occasionally; 3 = fairly often; and 4 = very often. Answer categories never, hardly ever, and occasionally have been defined as "any problems"; fairly often and very often were defined as "frequently reported problems."

Table 1 Ten Most Prevalent Frequently Reported Problems at Baseline and Their Prevalence After Treatment (%)

Rank	OHIP-G item	T_0	T_1	T_2
1	Difficulty chewing	31	12	0
2	Take longer to complete a meal	28	5	0
3	Food catching	26	8	0
4	Uncomfortable to eat	24	2	0
5	Unable to eat (because of dentures)	23	2	0
6	Dentures not fitting	22	7	0
7	Avoid going out	21	2	0
8	Self-conscious	19	2	0
9	Sore jaw	18	2	2
10	Worried	18	3	0

Frequently reported problems = items reported fairly often or very often (N = 100 patients); T_0 = baseline; T_1 = 1 month after treatment; T_2 = 6 to 12 months after treatment.

The number of frequently reported symptoms and problems was counted for each subject and analyzed at each visit (T_0, T_1, T_2) using medians and interquartile ranges (IQR) of item frequency. Because cross-sectional analysis of time series is not sufficient to characterize the change of problems, additional longitudinal analysis evaluated the persistence or incidence of problems and symptoms over time. For the longitudinal analysis, changes in number of problems between T_0 and T_1, T_1 and T_2, and T_0 and T_2 were characterized by median and IQR of the differences observed in individual patients. Changes in problem counts were investigated using the Wilcoxon matched pairs signed-ranks test. The level of statistical significance was adjusted by means of the Bonferroni procedure for multiple comparisons.

Reliability of Patient-Reported Problems

Test-retest reliability of patients' answers to OHIP questions was assessed in a convenience sample of 30 patients from the Department of Prosthodontics, Martin Luther University (mean age 50.7 ± 21.2 years, range 17 to 85 years; 53% women) using an interval of 2 weeks between administration of the two questionnaires.

Intraclass correlation coefficients (ICC) were calculated for all items, where subjects and raters were treated as random effects.[23] The median ICC for all items was 0.69 (IQR 0.52 to 0.82). Following guidelines,[24] 18 items (37% of all items) had an excellent reliability (ICC $>$ 0.75), 26 items (53%) showed fair to good reliability (ICC 0.40 to 0.75), and 5 items (10%) had poor reliability (ICC $<$ 0.40). In addition, for each OHIP-G item, a 5 $\times$ 5 agreement matrix was constructed using the five response categories (never to very often) as rows and columns. The percentage of agreement (the diagonal of the matrix) was calculated. The median agreement for all OHIP-G problems was 80% (IQR 73% to 90%). All analyses were performed using the statistical software package STATA, release 7 (Stata Statistical Software).

Missing Data

To ensure comparability of cross-sectional and longitudinal results, subjects were included only if they had near-complete data at baseline and follow-up assessments. Four subjects did not provide any data at the 6- to 12-month follow-up and were excluded from the analyses. Subjects were excluded from the analyses if 15 or more OHIP-G items were missing (10% of all data per subject) or when 10 or more OHIP-G questions were missing at baseline or at the two follow-ups (T_1 and T_2) (20% of the data per questionnaire). This left 100 subjects (n = 39 with FPDs, n = 29 with RPDs, and n = 32 with CDs) for analyses, with 0.6% missing data. Missing responses within this group of 100 subjects were imputed using regression methods described elsewhere.[6] The present article refers to these 100 subjects with complete or imputed data.

Results

Cross-Sectional Analysis: Frequency of Problems Before and After Treatment

At baseline, patients reported a median of 18.0 (IQR 9.0 to 33.0) problems frequently (ie, fairly often or very often). The number of frequently reported problems decreased for the entire group at 1 month after treatment (median 7.5, IQR 3.5 to 18.0 problems) and at 6 to 12 months after treatment (median 4.5, IQR 1.0 to 14.0 problems).

Table 1 presents the percentage of patients reporting impacts frequently (ie, fairly often or very often) for the 10 most frequent problems at baseline. Problems with chewing and eating dominated at

Table 2 Ten Most Prevalent Frequently Reported Problems at Second Follow-up and Their Prevalence at Baseline (%)

Rank	OHIP-G item	T_0	T_1	T_2
1	Sore spots	8	2	5
2	Painful gums	11	3	4
3	Discomfort (because of dentures)	9	7	3
4	Sore jaw	18	2	2
5	Financial loss	8	2	2
6	Digestion worse	1	0	1
7	Tense	9	3	1
8	Diet unsatisfactory	12	2	1
9	Depressed	6	3	1
10	Difficulty chewing	31	12	0

Frequently reported problems = items reported fairly often or very often (N = 100 patients); T_0 = baseline; T_1 = 1 month after treatment; T_2 = 6 to 12 months after treatment.

baseline: "difficulty chewing" (31%), "take longer to complete a meal" (28%), "food catching" (26%), and "uncomfortable to eat" (24%). Six to 12 months after treatment was finished, other frequently reported problems were most prevalent: "sore spots" (5%), "painful gums" (4%), "discomfort (because of dentures)" (3%), and "sore jaw" (2%) (Table 2).

Almost all of the 53 problems contained in OHIP-G were reported at baseline by at least some of the patients, with the exception of three items: "irritable with others," "unable to function," and "bothering joint noises." One month after treatment, 12 problems were not reported; these were primarily in the psychosocial dimension of OHIP (eg, "irritable with others," "less tolerant of others," "been embarrassed," "digestion worse"). At 6 to 12 months, the majority of the problems (n = 44) were absent.

Table 3 presents the 10 most prevalent frequently reported problems stratified by denture status. Among subjects treated with FPDs, frequently reported problems reported at baseline were rarely mentioned 1 month after treatment was finished. These problems remained absent at the second follow-up. In contrast, subjects receiving RPDs or CDs still reported frequently reported problems 1 month after treatment had been finished. Similar to subjects treated with FPDs, in the RPD and CD groups frequently reported problems disappeared by the time of the second follow-up (T_2). Substantial differences comparing subjects with RPDs and CDs were not observed.

Longitudinal Analysis: Changes in Problems in Individual Subjects

The median reduction in the number of frequently reported problems between T_0 and T_1 was 5.0 (IQR 1.5 to 10.0), supporting findings from the cross-sectional analysis that the majority of frequently reported problems disappeared at the first follow-up (Table 1). A further reduction of frequently reported problems from T_1 to T_2 was still observed (median 3.0, IQR 0.5 to 6.0). The total median reduction from T_0 to T_2 was 8.5 (IQR 5.0 to 19.0). All changes in problem counts ($T_0 - T_1$, $T_1 - T_2$, $T_0 - T_2$) were statistically significant (all comparisons $P < .001$).

The longitudinal analysis supported the finding that the types of frequently reported problems before treatment were different from frequently reported problems at follow-up (Table 1). Frequently reported problems reported before treatment (problems with eating and chewing) disappeared in the course of prosthodontic treatment (Table 4). For example, all 25% of the patients whose "difficulty chewing" disappeared between baseline and 1 month continued to report an absence of difficulty chewing at 6 to 12 months.

However, new problems arose during treatment (Table 5). The newly developed frequently reported problems and symptoms were mainly related to the new dentures (eg, "sore spots," "painful gums," "discomfort (because of dentures)," "sore jaw"), although their frequency was not substantial (1% to 5%). Symptoms that disappeared between the first and second visits did not tend to return later.

The three prosthodontic groups (FPD, RPD, and CD) differed from each other in the types of problems that decreased. The fewest problems at T_1 were observed in patients receiving FPDs. The largest number of problems was observed in the RPD group. Problems disappeared fastest and most completely in FPD wearers. One month after treatment (T_1), most symptoms remained in the RPD patients. No major differences could be observed between different denture groups 6 to 12 months after treatment.

Table 3 Ten Most Prevalent Frequently Reported Problems at Baseline Stratified by Denture Group and Their Prevalence After Treatment (%)

Group/rank	OHIP-G item	T_0	T_1	T_2
Fixed partial dentures (n = 39)				
1	Food catching	36	3	0
2	Sore jaw	28	0	0
3	Uncomfortable to eat	28	0	0
4	Unable to eat (because of dentures)	28	0	0
5	Take longer to complete a meal	28	0	0
6	Difficulty chewing	26	0	0
7	Dentures not fitting	23	0	0
8	Interrupt meals	23	0	0
9	Avoid going out	21	0	0
10	Avoid smiling	13	3	0
Removable partial dentures (n = 29)				
1	Worried	34	7	0
2	Self-conscious	34	7	0
3	Unable to eat (because of dentures)	34	7	0
4	Difficulty chewing	31	38	0
5	Painful aching	31	7	0
6	Uncomfortable to eat	31	7	0
7	Avoid eating	31	7	0
8	Avoid smiling	31	7	0
9	Sensitive teeth	28	7	0
10	Take longer to complete a meal	28	17	0
Complete dentures (n = 32)				
1	Difficulty chewing	38	3	0
2	Self-conscious	28	0	0
3	Appearance	28	0	0
4	Health worsened	28	0	0
5	Take longer to complete a meal	28	0	0
6	Sleep interrupted	25	13	0
7	Food catching	22	16	0
8	Dentures not fitting	22	16	0
9	Discomfort (because of dentures)	22	16	0
10	Avoid going out	22	0	0

Frequently reported problems = items reported fairly often or very often (N = 100 patients); T_0 = baseline; T_1 = 1 month after treatment; T_2 = 6 to 12 months after treatment.

Table 4 Four Most Often Reported Frequent Problems at Baseline as Reported by Individual Patients over Time (%)*

Difficulty chewing				Take longer to complete a meal				Food catching				Uncomfortable to eat			
T_0				T_0				T_0				T_0			
31^+			69^-	28^+		72^-		26^+		74^-		24^+		76^-	
T_1		T_1		T_1		T_1		T_1		T_1		T_1		T_1	
6^+	25^-	6^+	63^-	5^+	23^-	0^+	72^-	8^+	18^-	0^+	74^-	2^+	22^-	0^+	76^-
T_2	T_2	T_2	T_2	T_2	T_2	T_2	T_2	T_2	T_2	T_2	T_2	T_2	T_2	T_2	T_2
0^+ 6^-	0^+ 25^-	0^+ 6^-	0^+ 63^-	0^+ 5^-	0^+ 23^-	0^+ 0^-	0^+ 72^-	0^+ 8^-	0^+ 18^-	0^+ 0^-	0^+ 74^-	0^+ 2^-	0^+ 22^-	0^+ 0^-	0^+ 76^-

*Patients (N = 100) started at baseline with either the presence (+) or absence (–) of a symptom. Present symptoms could remain present or disappear at the next assessment; absent symptoms could remain absent or be present at the next assessment.
T_0 = baseline; T_1 = 1 month after treatment; T_2 = 6 to 12 months after treatment.

Discussion

Prosthodontic Patients Have Many Problems

Oral health problems experienced by patients seeking prosthodontic treatment are important for diagnosis and prosthodontic therapy. Prosthodontic patients score highly using OHRQoL instruments,[11,19,25] indicating that they have diminished OHRQoL. However, as all problems are combined to produce a mean score, it is not known what kind of problems these patients have.

The present study has shown that problems with eating and chewing (eg, "difficulty chewing," "take longer to complete meal," "food catching," "uncomfortable to eat," "unable to eat because of dentures") dominated when patients first sought prosthodontic treatment. This is consistent with a study[26] of elderly

Table 5 Four Most Often Reported Frequent Problems at 6 to 12 Months as Reported by Individual Patients over Time (%)*

Sore spots								Painful gums								Discomfort (because of dentures)								Sore jaw							
T_0								T_0								T_0								T_0							
8^+						92^-		11^+						89^-		9^+						91^-		18^+						82^-	
T_1						T_1		T_1						T_1		T_1						T_1		T_1						T_1	
2^+		6^-		0^+		92^-		3^+		8^-		0^+		89^-		7^+		2^-		0^+		91^-		2^+		16^-		0^+		82^-	
T_2		T_2		T_2		T_2		T_2		T_2		T_2		T_2		T_2		T_2		T_2		T_2		T_2		T_2		T_2		T_2	
2^+	0^-	0^+	6^-	0^+	0^-	3^+	89^-	2^+	1^-	0^+	8^-	0^+	0^-	2^+	87^-	0^+	7^-	0^+	2^-	0^+	0^-	3^+	88^-	2^+	0^-	0^+	16^-	0^+	0^-	0^+	82^-

*Patients (N = 100) started at baseline with either the presence (+) or absence (–) of a symptom. Present symptoms could remain present or disappear at the next assessment; absent symptoms could remain absent or be present at the next assessment.
T_0 = baseline; T_1 = 1 month after treatment; T_2 = 6 to 12 months after treatment.

Sinhalese people, in which 17% of subjects reported the problem "uncomfortable to eat." However, that study used OHIP-14, which excludes many of the items queried in our study. In the present study, patients had at baseline a mean of 18.0 problems (range 1 to 52 problems). This is a high rate of problems, probably because OHIP is able to elicit even subtle problems. Such a questionnaire may be advantageous for diagnosis and treatment planning in prosthodontics because it assesses patients' problems in a standardized way, allowing a comparison across patients and settings.

Patients "Lose" Their Problems During and After Prosthodontic Treatment

It is known from other studies using OHRQoL instruments[11,19,25] that problems reported at baseline decrease in frequency and severity in the course of prosthodontic therapy. However, the current study is the first to provide longitudinal data about changes of patients' problems and symptoms in the course of prosthodontic treatment. Shortly after therapy, the number of reported problems diminished markedly. The mean number of problems at T_1 was fewer than half of the pretreatment problem count, decreasing further to one quarter of the pretreatment problems by T_2. Large differences in the number of problems between individual patients were observed. For example, whereas some patients did not report any problems at all 6 to 12 months after treatment, at least one patient continued to report 39 problems. Obviously, the number of reported problems varies substantially between patients. On the other hand, some problems not reported before treatment appeared at follow-up visits. Therefore, the total number of problems/symptoms is a reflection of the decrease of baseline problems and of newly developed problems.

Patients Develop New Problems During Prosthodontic Treatment

Summary scores that combine all problems into one summary measure can hide the fact that some new problems may appear while most disappear after prosthodontic therapy. Summary scores are not able to detect these opposite trends, which are clinically important.

It is plausible from clinical experience that sore spots may occur as new problems with RPDs and CDs. However, most of the baseline and 1-month follow-up problems/symptoms disappeared 6 to 12 months after treatment, at the end of the incorporation period. The most prevalent problems at the second follow-up could be divided into two groups: problems with the new dentures ("sore spots," "painful gums," "discomfort (because of dentures)," "sore jaw," "digestion worse," "diet unsatisfactory," "difficulty chewing") and problems representing psychosocial impact ("financial loss," "tense," "depressed"). However, all of those problems were encountered with low frequency.

Differences Between Denture Groups

Although the number of patients in different denture groups was not sufficient for a detailed intergroup comparison, some interesting trends were observed and should be explored further in future studies of larger groups. Impacts decreased most rapidly among FPD wearers, whereas impacts decreased among RPD wearers the slowest. Based on our findings that 1 month after treatment (T_1), most symptoms remained in the RPD group, one may speculate that this kind of sophisticated treatment requires a longer adaptation period and may even create new problems for patients. Interestingly, CD wearers had fewer problems at T_1 than did patients with RPDs. We

hypothesize that patients getting different types of prostheses need adaptation periods of different lengths. However, once incorporated after a sufficiently long time period (T_2), all three denture types rendered good results and eliminated the majority of problems reported at baseline.

Limitations and Strengths of the Study

Our study has several shortcomings. Although 100 clinical patients seems to be a moderate number of subjects, our sample size did not allow detailed analyses of results according to type of dentures. Denture status is an important variable,[27] but stratifying results on this variable in all analyses would have made groups too small. Instead, we stratified results only according to the type of prosthodontic treatment received. Ideally, we would have liked to further stratify the results by pretreatment prosthodontic status, for example: *(1)* patients having no dentures at baseline and receiving FPDs, *(2)* patients presenting with FPDs and receiving new FPDs, and *(3)* patients presenting with RPDs and receiving FPDs. We expect there would be important differences among these subgroups, but we had insufficient numbers of patients to permit separate analyses of them. Future studies should use more distinct patient groups (eg, patients treated only with crowns, patients treated only with metal cast-frame prostheses).

A fundamental limitation for the interpretation of the findings is the study design. Our study is a case series, which only rarely allows the investigation of cause-effect relationships. For example, regression to the mean effects observed for OHIP studies may have influenced observed results. On the other hand, only a small improvement in the OHIP summary score was observed over a period of 2 weeks in prosthodontic patients without intervention.[12] Although regression to the mean effects may therefore not substantially explain our study results, causal interpretation that prosthodontic treatment is responsible for all observed changes in problems/symptoms should be done carefully because our study design could also have been influenced by the natural fluctuation of problems/symptoms and by chance.

It is a strength of this study that we used an internationally well accepted, standardized instrument with closed instead of open questions. This allows a comparison of results across settings and studies. Norms (ie, data about the frequency of "any problems" and "frequent problems" in the general population) are available for comparison.[6] In addition, information about reliability of the items is available, allowing assessment of the influence of measurement error on the results.

Conclusion

Patients reported a variety of problems and symptoms, mostly related to chewing and eating, before prosthodontic therapy. The number of initial problems decreased substantially after treatment. The median reduction of problems from baseline to the second follow-up was 8.5. All changes in problem counts were statistically significant. Problems decreased in FPD wearers the fastest (largest), and in RPD wearers the slowest (smallest). A few new problems that were not reported at baseline emerged in the course of, or shortly after, prosthodontic treatment. These were mostly related to problems with the new dentures and disappeared by the second follow-up. The profile of pre- and posttreatment problems differed substantially, but in general, only a small number of problems remained after adaptation to dentures.

References

1. John MT, Hujoel PP, Miglioretti DL, LeResche L, Koepsell TD, Micheelis W. Dimensions of oral health-related quality of life. J Dent Res 2004;83:956–960.
2. Slade GD, Spencer AJ. Development and evaluation of the Oral Health Impact Profile. Community Dent Health 1994;11:3–11.
3. Slade GD, Strauss RP, Atchison KA, Kressin NR, Locker D, Reisine ST. Conference summary: Assessing oral health outcomes—Measuring health status and quality of life. Community Dent Health 1998;15:3–7.
4. Slade GD, Spencer AJ. Social impact of oral conditions among older adults. Aust Dent J 1994;39:358–364.
5. Slade GD, Spencer AJ, Locker D, Hunt RJ, Strauss RP, Beck JD. Variations in the social impact of oral conditions among older adults in South Australia, Ontario, and North Carolina. J Dent Res 1996;75:1439–1450.
6. John MT, LeResche L, Koepsell TD, Hujoel PP, Miglioretti DL, Micheelis W. Oral health-related quality of life in Germany. Eur J Oral Sci 2003;111:483–491.
7. Allen PF, McMillan AS, Locker D. An assessment of sensitivity to change of the Oral Health Impact Profile in a clinical trial. Community Dent Oral Epidemiol 2001;29:175–182.
8. Allen PF, McMillan AS, Walshaw D. A patient-based assessment of implant-stabilized and conventional complete dentures. J Prosthet Dent 2001;85:141–147.
9. Awad MA, Feine JS. Measuring patient satisfaction with mandibular prostheses. Community Dent Oral Epidemiol 1998;26:400–405.
10. Awad MA, Locker D, Korner-Bitensky N, Feine JS. Measuring the effect of intra-oral implant rehabilitation on health-related quality of life in a randomized controlled clinical trial. J Dent Res 2000;79:1659–1663.
11. Heydecke G, Locker D, Awad MA, Lund JP, Feine JS. Oral and general health-related quality of life with conventional and implant dentures. Community Dent Oral Epidemiol 2003;31:161–168.
12. John MT, Patrick DL, Slade GD. The German version of the Oral Health Impact Profile—Translation and psychometric properties. Eur J Oral Sci 2002;110:425–433.
13. Slade GD. Derivation and validation of a short-form oral health impact profile. Community Dent Oral Epidemiol 1997;25:284–290.
14. Wong MC, Lo EC, McMillan AS. Validation of a Chinese version of the Oral Health Impact Profile (OHIP). Community Dent Oral Epidemiol 2002;30:423–430.

15. Larsson P, List T, Lundström I, Marcusson A, Ohrbach R. Reliability and validity of a Swedish version of the Oral Health Impact Profile (OHIP-S). Acta Odontol Scand 2004;62:147–152.
16. Ekanayake L, Perera I. Validation of a Sinhalese translation of the Oral Health Impact Profile-14 for use with older adults. Gerodontology 2003;20:95–99.
17. Allen PF, McMillan AS. A longitudinal study of quality of life outcomes in older adults requesting implant prostheses and complete removable dentures. Clin Oral Implants.Res 2003;14:173–179.
18. Slade GD. Reactor paper. J Dent Educ 1996;60:514–519.
19. John MT, Slade G, Szentpetery A, Setz JM. Oral health–related quality of life in patients treated with fixed, removable, and complete dentures 1 month and 6 to 12 months after treatment. Int J Prosthodont 2004;17:503–511.
20. Frank RP, Milgrom P, Leroux BG, Hawkins NR. Treatment outcomes with mandibular removable partial dentures: A population-based study of patient satisfaction. J Prosthet Dent 1998;80:36–45.
21. Redford M, Drury TF, Kingman A, Brown LJ. Denture use and the technical quality of dental prostheses among persons 18–74 years of age: United States, 1988–1991. J Dent Res 1996;75:714–725.
22. Laine P. Adaptation to denture-wearing. An opinion survey and experimental investigation. Proc Finn Dent Soc 1982;78:1–150.
23. Shrout PE, Fleiss JL. Intraclass correlations: Uses in assessing rater reliability. Psychol Bull 1979;86:420–428.
24. Fleiss JL. The Design and Analysis of Clinical Experiments. New York: Wiley, 1986.
25. Locker D, Jokovic A, Clarke M. Assessing the responsiveness of measures of oral health-related quality of life. Community Dent Oral Epidemiol 2004;32:10–18.
26. Perera I, Ekanayake L. Prevalence of oral impacts in a Sinhala-speaking older population in urban Sri Lanka. Community Dent Health 2003;20:236–240.
27. John MT, Koepsell TD, Hujoel PP, Miglioretti DL, LeResche L, Micheelis W. Demographic factors, dental status and oral health-related quality of life. Community Dent Oral Epidemiol 2003;32:125–132.

Literature Abstract

Immediate loading of hydroxyapatite-coated implants in the maxillary premolar area: Three-year results of a pilot study

Dental implants have become a predictable treatment option for the completely or partially edentulous patient. A 3- to 6-month healing period is usually recommended to achieve osseointegration before loading implants with a prosthesis. Immediate loading of endosseous root form implants has been described in the literature for eliminating the 3- to 6-month healing period. The purpose of this study was to evaluate the clinical parameters of immediate loading single, hydroxyapatite-coated (HA) root form implants in the maxillary premolar region. Ten consecutively treated human subjects were included in this report. Hydroxyapatite-coated threaded root form implants were placed in the maxillary premolar area. In all patients, a screw-retained, implant-supported provisional prosthesis was placed immediately after stage I surgery. Standardized periapical radiographs were made after implant placement. Implant mobility was evaluated using the Perio-Test device. At 1, 3, and 6 months after implant surgery, standardized radiographs were made with the provisional crown in place. At 3 and 6 months after implant surgery, the provisional screw-retained acrylic resin crown was removed. The following parameters were recorded after removing the provisional crown: *(1)* peri-implant probing depth (PPD) at an accuracy of 1 mm, *(2)* bleeding index (BI), *(3)* distance from the implant platform to the depth of the sulcus (PDS), and *(4)* distance from the implant platform to the gingival crest (PGC). At 6, 12, and 36 months after surgery, standardized radiographs, mobility, and PPD, PDS, PGC, and BI measurements were made and recorded with the definitive restoration already delivered. For all patients, implants healed uneventfully with no complications. Radiographic examination revealed 0.6 mm of marginal bone loss at 1 month after surgery as compared with the radiograph made immediately after surgery. The corresponding marginal bone loss at 3, 6, 12, and 36 months was 0.7, 0.8, 0.9, and 0.10, respectively. The results of this pilot study demonstrated that HA-coated implants placed in the maxillary premolar region may be immediately loaded by placing a screw-retained acrylic resin crown the day of implant surgery. The 3-year post-loading implant success rate was 100%. Bone loss around implants was 1.0 mm (±0.26) 3 years after implant placement and loading.

Proussaefs P, Lozada J. *J Prosthet Dent* 2004:91:228–233. **References:** 48. **Reprints:** Dr Periklis Proussaefs, Loma Linda University, School of Dentistry, Graduate Program in Implant Dentistry, Loma Linda, CA 92350—*Khaldoun Alajlouni, UNMC College of Dentistry, Lincoln, NE*