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Within-subject comparisons of maxillary fixed and removable implant prostheses

Patient satisfaction and choice of prosthesis

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Abstract: Dental implants provide patients with restorative options for the edentulous maxilla. Both fixed and removable prostheses can be attached to the edentulous maxilla, but the efficacy of different designs has not been determined. In this two-session within-subject crossover trial we compared maxillary implant retained fixed prostheses with removable implant overdentures opposed by mandibular implant-supported overdentures. Sixteen patients, who had previously received mandibular implants, entered the study and received four to six maxillary implants. After dropouts as a consequence of a lack of osseointegration and general health problems, 13 remained. Of these, five received the removable prosthesis first and eight the fixed prosthesis. After 2 months, the prostheses were exchanged and the second was also worn for 2 months. Psychometric measurements of general satisfaction with the prostheses as well as comfort, ability to speak, stability, esthetics, ease of cleaning and occlusion were obtained once each prosthesis had been worn for 2 months. Chewing ability was assessed for seven types of food. Removable long-bar overdentures received significantly higher ratings of general satisfaction than fixed prostheses ($P = 0.003$). Patients also rated their ability to speak and ease of cleaning significantly better with the removable overdentures. Nine patients chose to keep the removable prosthesis and four preferred to keep the fixed prosthesis. The results suggest that maxillary removable overdentures on multiple implants may provide patients with better function than fixed prostheses.
Heydecke G, Boudrias P, Awad MA, de Albuquerque Jr RF, Lund JP, Feine JS. Within subject comparisons of maxillary fixed and removable implant prostheses: Patient satisfaction and choice of prosthesis.

A number of studies have used patient-based outcomes to measure the performance of mandibular implant-borne prostheses for edentulous patients. Satisfaction with different aspects of the prostheses has been used to measure the efficiency of treatment (de Grandmont et al. 1994; Feine et al. 1994a; Boerrigter et al. 1995a,b; Burns et al. 1995; Tang et al. 1997). Most studies demonstrated that mastication and speech were significantly better with implant-supported prostheses than with conventional complete dentures. Furthermore, patients were significantly more satisfied with the comfort, stability, and esthetics of the implant-supported prostheses (de Grandmont et al. 1994; Feine et al. 1994a; Awad & Feine 1998).

If a sufficient number of implants can be inserted and clinical criteria are met, the majority of clinicians would most likely suggest that a fixed prosthesis would be the treatment of choice because it is more stable than any removable appliance (De-

Boer 1993; Sadowsky 1997). However, results from a randomized within-subject crossover trial of mandibular implant prostheses suggest that patients may not share this opinion. Indeed, no significant differences in patient satisfaction with mandibular implant overdentures and fixed prostheses were found (de Grandmont et al. 1994).

As part of a series of within-subject crossover comparisons of various designs of implant-supported prostheses (de Grandmont et al. 1994; Feine et al. 1994a,b; Tang et al. 1997, 1999; de Albuquerque et al. 2000), we have already reported on different types of removable maxillary implant overdentures (de Albuquerque et al. 2000).

This study was designed to compare patient satisfaction with maxillary implant-supported fixed prostheses (FP) and removable overdentures retained by a long parallel bar (LBO). The null hypothesis was that there is no significant difference in patient satisfaction with the two types of prostheses.

Material and methods

Study population

Sixteen completely edentulous French-speaking subjects were enrolled in this study. Participants were recruited from a pool of respondents to newspaper advertisements, who had been edentulous for 10 years or more and who reported chronic problems with their conventional dentures. The subjects in this trial had already participated in a comparison of fixed and removable mandibular implant prostheses (Tang et al. 1997, 1999). Other details of the recruiting process and the exclusion and inclusion criteria have been described elsewhere (de Grandmont et al. 1994; Tang et al. 1997; de Albuquerque et al. 2000).

The minimum sample size ($n = 14$) was calculated using standard statistical criteria ($\alpha = 0.05$, $\beta = 0.20$) for a mean difference of 10 mm on 100-mm VAS and a variance of $(SD)^2$, based on a previously determined standard deviation of 7.4 mm for this type of trial (Feine et al. 1991). Two patients were added to compensate for dropouts (Cohen 1988; de Grandmont et al. 1994). Detailed written information was provided to all participants prior to obtaining formal consent.

Study design

All participants rated their satisfaction with their original conventional maxillary dentures prior to treatment. A quasi-random process to match the groups for age and gender was used to assign the subjects to groups that received either the long-bar overdenture or the fixed prosthesis first (Cox 1958). After 2 months of adaptation, the subjects rated their satisfaction with different aspects of the prostheses. Subsequently, the prostheses were changed and the measurements were repeated after another 2-month adaptation period to minimize carry-over effects (de Grandmont et al. 1994).

Treatment

Four to six titanium implants (Branemark®, Nobel Biocare, Gothenburg, Sweden) were placed in the maxilla of each subject following a standard protocol. Six months later, second-stage surgery was performed and healing abutments were attached. All patients were wearing mandibular implant-supported overdentures at the start of this trial.

Two maxillary prostheses were fabricated for each patient by the same prosthodontist following standard procedures. The framework for the fixed prostheses was cast from a nonprecious alloy allowing for a distal cantilever of 10–15 mm. Abutment height was chosen to be no more than 1 mm above the gingival level to minimize esthetic and phonetic problems and to allow for cleaning of the base and abutments using dental floss. A parallel-sided gold bar (Cendres et Métaux SA, XXX, XXX) linking all implants was fabricated for the long-bar overdentures. The bar also had distal extensions to fully support the denture and to prevent rotation. The overdenture was designed without palate and was retained by three to five clips, which were embedded in the acrylic base of the prosthesis. Contour, vertical dimension and occlusion were replicated using a silicon index to match the two different types of prostheses as closely as possible. The same teeth (SR Antaris/Postaris®, Ivoclar Williams, Amherst, NY) were used in the two prostheses.

Patient-based measures

Ratings of the prostheses during the crossover period

Patient ratings were obtained on 100-mm visual analogue scales (VAS) and category scales (CAT) (de Grandmont et al. 1994). The VAS measures were used to assess general satisfaction with the prosthesis, general satisfaction as compared to natural teeth, comfort, ability to speak, stability, esthetics, ease of cleaning, occlusion and the ability to chew seven index foods. The anchor words were 'totally dissatisfied' and 'completely satisfied'. The subjects were asked to draw a vertical line at the point on the horizontal line which best represented their response. CAT questions (Tang et al. 1997) were used to obtain information about the patients' physical and psychosocial function and general health. Patients were asked to choose the word from a four-point Likert scale that best described their response.

Choice of prosthesis

All participants were asked to compare the fixed and the removable prostheses directly at the final appointment. A separate VAS was provided for each of the two treatments measuring general satisfaction, comfort, ability to speak, stability, esthetics, ease of cleaning, occlusion and ability to chew (Feine et al. 1994a).

Subjects then chose their preferred prosthesis and rated the importance of each of the above-mentioned factors in their choice.

Statistical analysis

The primary outcome measure selected for this evaluation was the general satisfaction of patients measured on the VAS. The analysis of the VAS and CAT data from the crossover sessions was performed following a procedure recommended by Hills & Armitage (1979), which considers several possible sources of variation. These include period and treatment effects as well as carry-over effects. Kolmogorov-Smirnov tests were used to confirm the normal distribution of the data. All comparisons were carried out using *t*-tests. Mann–Whitney *U* tests were used for categorical data (CAT). Data on the direct comparison of the two treatments and of the influence of different factors on choice collected in the final session were analyzed using paired *t*-tests. An alpha level of 0.05 was accepted for significance.

Results

Thirteen subjects, six males and seven females, completed the study; five had re-

ceived the LBO and eight the FP first. Three subjects from the LBO group were excluded from the study prior to receiving their prostheses because of premature implant failure or general health problems, resulting in unequal group sizes. The mean age of the subjects was 45.1 years (standard deviation 7.4 years). Subjects reported a general satisfaction with their old maxillary dentures of 54.5 mm VAS (SD = 23.2 mm).

A significant period effect was detected for the primary outcome, general satisfaction. The sample rated their satisfaction with the second prosthesis (88.9 mm, SD = 11.5 mm) significantly higher ($P = 0.009$) than with the first (64.2 mm, SD = 27.5 mm).

A significant treatment effect was also detected. Patients gave significantly higher ratings of general satisfaction to the long-bar overdenture (87.2 mm, SD = 13.4 mm) than to the fixed prosthesis (65.8 mm, SD = 28.1 mm), regardless of whether the LBO was received first or second ($P = 0.020$).

Thirdly, a significant period–treatment interaction (or carry-over effect; $P = 0.008$) was also demonstrated. Individuals who received the implant overdenture first (91.3 mm, SD = 9.1 mm) assigned higher average ratings to their treatments than those who received the fixed prosthesis first (67.3 mm, SD = 14.9 mm).

As recommended by Hills & Armitage (1979), only the data from the first session of the crossover period were used for further comparisons because of the significant period effect and period–treatment interaction. A Kolmogorov-Smirnov test was used to confirm the normal distribution. A normal distribution was found on all scales except for the stability scale ($P = 0.048$). Since the *t*-test approach is usually robust enough in cases where equal variances can be assumed (Cohen 2001), and for reasons of consistency, we used *t*-tests for all VAS comparisons.

Between-treatment comparisons

Patients rated their general satisfaction, general satisfaction as compared to natural teeth, ability to speak and ease of cleaning significantly better with the LBO than with the FP (Table 1). However, no significant differences were detected for comfort, stability, esthetics and occlusion. In addition, no significant between-treatment differences were detected for the ability to chew any of the seven index foods (white bread, cheese, raw carrot, hard sausage, raw apple, nuts and salad; Mann–Whitney test). High VAS scores (75–97 mm) were reported for both treatments, indicating good chewing ability.

Table 1. **VAS scores for the different aspects of satisfaction with maxillary implant-supported prostheses. The LBO is consistently rated more satisfactory than the fixed prosthesis (FP)**

Dependent variables	Significance (two-tailed)	LBO	SD	FP		95% CI	
		Mean		Mean	SD	Lower	Upper
General satisfaction	0.003*	89.20	14.10	48.50	21.35	16.82	64.58
General satisfaction compared to natural teeth	0.010*	94.20	11.88	49.14	30.02	13.17	76.94
Comfort	0.085	96.50	5.20	76.75	19.85	− 3.25	42.75
Ability to speak	0.036*	94.00	9.17	61.75	28.80	2.60	61.90
Stability	0.462	96.40	5.50	84.38	34.42	− 22.68	46.73
Esthetics	0.085	94.60	7.86	76.88	24.02	− 3.02	38.47
Ease of cleaning	0.004*	86.00	16.78	36.50	26.73	19.88	79.12
Occlusion	0.284	95.80	6.72	86.75	16.91	− 8.62	26.72

*Significant, $P < 0.05$, *t*-test.
CI, confidence interval.

Significant differences on the CAT scales were found for 'avoiding conversation' ($P = 0.034$) and 'embarrassment at work' ($P = 0.004$); both in favor of the LBO, indicating a higher negative impact on psychosocial function of the FP treatment. No significant differences were found for any of the other questions assessing physical and psychosocial function and general health.

Final appointment VAS ratings and choice of prosthesis

When all subjects compared the two prostheses side by side, results were consistent with the data gathered during the course of the study. General satisfaction ($P = 0.008$), ability to speak ($P = 0.036$) and ease of cleaning ($P = 0.003$) were all rated significantly better with the LBO. No differences were found for comfort, stability, esthetics, occlusion or ability to chew.

Four subjects wished to keep the fixed prosthesis, but nine preferred the long-bar overdenture as their final prosthesis. There was no significant difference in age between subjects choosing the fixed prosthesis and those choosing the LBO (*t*-test, $P = 0.821$).

For subjects who preferred the LBO, ability to speak, ease of cleaning, general satisfaction and esthetics were the factors with the most influence on the choice, and there were significant differences in importance between those aspects (Table 2 $P = 0.009$; Friedman test). The four most important factors for choosing the FP were comfort, general satisfaction, ability to speak and stability ($P = 0.085$).

Comments regarding the choice of prosthesis were also obtained. Patients choosing the fixed prosthesis described it as less bulky and more stable, and felt more secure with it. Complaints regarding the LBO were that often saliva and food particles collected underneath the denture base. Those subjects who chose the LBO complained about the difficulty of speaking with the fixed prosthesis, the visibility of abutment parts and the associated discoloration of the gingiva. They found the LBO more comfortable and far easier to clean than the FP.

Discussion

In this clinical crossover trial, we compared fixed and removable prostheses using patient-based outcome measures. The results indicate that maxillary long-bar overdentures (LBO) without palate are more satisfactory to most patients than a fixed implant-supported bridge.

The strong positive response to implant overdentures is consistent with the results from an earlier trial using the same outcome measure. Mean general satisfaction with an LBO without palatal coverage was 88 mm on a 100-mm VAS scale. High ratings between 89 mm and 96 mm reported for retention, comfort, esthetics, ease of cleaning and stability were also similar to the findings from the current study (de Albuquerque et al. 2000).

The significant mean difference of 40.7 mm found in this study for general satisfaction with maxillary prostheses suggests that general satisfaction could be associated with factors like speech and esthet-

Table 2. **Ranking of the importance of each factor for the choice of the prosthesis (mm VAS)**

Rank of importance for choice	Aspect	LBO		FP
		VAS (mm)	Aspect	VAS (mm)
1.	Ability to speak	79.7	Comfort	99
2.	Ease of cleaning	65.6	General satisfaction	97
3.	General satisfaction	64.6	Ability to speak	91
4.	Esthetics	54.3	Stability	77.8

ics, which are less likely to cause problems in the mandible (de Grandmont et al. 1994). Both factors, speech and esthetics, play an important role in the acceptance of maxillary prostheses (Kaptein et al. 1998; de Albuquerque et al. 2000). Satisfaction with ability to speak was significantly worse with the FP. These postinsertion speech problems often persist over several months (Lundqvist et al. 1992b). Negative comments concerning the FP, which were obtained during the course of the study, confirmed that several patients had been unhappy about the inability to pronounce words properly (Lundqvist et al. 1992b). Patients restored with FPs frequently incur speech problems with the s-sounds being the most affected. It has been suggested that the changes in sound are not related to the size of interdental spaces, but depend on the frontal width of the prostheses (Lundqvist et al. 1992a; Lundqvist et al. 1992b). Removable overdentures (LBO) are much closer to the shape of the complete dentures previously worn by our subjects, whereas the bases of FPs are generally narrower, which could explain part of the speech adaptation problems found for the FP.

Satisfaction with esthetics was not significantly different between groups, but significance was approached at $p = 0.085$. A number of patients mentioned that the visibility of the 'hardware' and unnatural appearance of the gingival tissue when wearing the FP were unacceptable to them.

The importance of both factors, speech and esthetics, is underscored by the results obtained on the CAT scales. Significantly higher impacts on speech function ('Do you avoid conversations because of your prosthesis') and embarrassment at work ('Are you embarrassed at work because of your prosthesis') were reported for the FP.

Another significant difference between the two treatments was evident in ease of cleaning. Patients receiving oral implant therapy are often well motivated to perform adequate oral hygiene. Even though the sample was middle aged (mean age 45.1 years) without known deficiencies in dexterity, subjects found the LBO to be more hygiene friendly than the FP, which was described as very difficult to clean (Feine et al. 1994a; Kaptein et al. 1998).

In the present study we found no significant difference in comfort, stability, ability to chew seven index foods and occlusion between the two treatments. This could be explained by the fact that both types of restorations were fully supported by implants and no load was transmitted to the mucosa (de Grandmont et al. 1994).

The results obtained during the trial were confirmed by the results of the direct comparison of both treatments at the end of the study. Patients ranked the LBO significantly better for general satisfaction, ability to speak and ease of cleaning. More subjects chose the LBO and had specific reasons for doing so (Feine et al. 1994a). In the LBO group, ability to speak and ease of cleaning ranked first and second. Despite no significant difference in ranks for subjects who preferred the FP, comfort and stability were among the four most important reasons (Table 2). FP choice subjects felt assured that they would not lose the prosthesis in public, that there was no need to remove it for cleaning and they perceived it to be less bulky than the removable prosthesis. It has previously been suggested, that a removable prosthesis might not be the treatment of choice for individuals who consider something removable to be a foreign body (van Steenberghe 1989; Feine et al. 1994a).

However, our results are in contrast to those of Zitzmann & Marinello 2000), who found no significant differences between LBO and FP prostheses for patient satisfaction with comfort/retention, function, esthetics, taste, speech or self-esteem in their nonrandomized cohort study. There could be several explanations for these findings. Zitzmann & Marinello 2000) used a parallel between group design without randomization. Subjects were assigned to each of the two groups based on clinical indications. The fixed prosthesis was given to the patients with the most residual bone, the removable appliance to those with to those with more severe resorption. Secondly, although Zitzmann & Marinello used VAS questionnaires for the assessments of the different aspects of the prostheses, they provided no evidence of the reliability or sensitivity of their instruments (Zitzmann & Marinello 2000). The psychometric properties of the scales used in our study were established at a very early stage and the continued use of the instruments over many studies has confirmed their validity for this type of application (de Grandmont et al. 1994; Feine et al. 1994a; Tang et al. 1997; Awad & Feine 1998). Finally, the results from the Zitzmann et al. study are based on observations from 10 subjects per group. Based on the means and standard deviations from the speech scale, the we calculated that the test had a power of 37%. For the statistical detection of 10-mm difference on a 100-mm VAS with sufficient power (80%; $\alpha = 0.05$, $\beta = 0.20$), a sample of 25–30 subjects per group would have been required (Cohen 1988).

There are a number of factors that must be taken into account when applying the results from this trial. Firstly, a strong period effect was noted in this trial. This could suggest the need for an adaptation period of more than 2 months for such prostheses, but as this did not occur in any of our previous trials in which prostheses were worn for 2 months (de Grandmont et al. 1994; Feine et al. 1994a; Tang et al. 1997), it may be simply a chance occurrence. Several other reasons for carry-over effects have been suggested. They include psychological carry-over effects, direct-by-period interaction and significant group differences (Jones & Kenward 1989).

Secondly, three LBO patients dropped out during the first crossover phase. This would have introduced a bias if these subjects had left as a result of dissatisfaction (or extreme satisfaction) with treatment. However, this was not the case as the dropouts occurred prior to receipt of the prostheses.

Thirdly, only data from the first crossover period were used. This reduced the power of the study because it halved the number of observations, and also introduced between-subject variation, which would not have been the case if observations from both periods had been used (Hills & Armitage 1979). Still, significant

differences were found. The direct comparison of both prostheses after completion of the trial using the responses from all 13 subjects (= 13 observations per prosthesis) fully confirmed and validated the results obtained during the crossover sessions. Significance was detected for the same aspects in both comparisons.

In this trial, we tested multiple hypotheses. Adjustment for multiple testing has been an issue of debate. Several authors in the medical and dental field have argued that, if results are interpreted with caution concerning their plausibility, such adjustments may not be necessary (Perneger et al. 1998; Stevenson et al. 1999). Although one must bear in mind the increased likelihood of finding significance by chance (which is the reasoning behind Bonferroni adjustments), one should also consider carefully the plausibility of the findings. In our study, it is unlikely that the four significant differences between the groups arose by chance alone, since they were all in the same direction (LBO > FP). Furthermore, findings of significant differences in general satisfaction and in general satisfaction compared to natural teeth show internal consistency. The significant difference in ability to speak is highly plausible because the gap between the mucosa and the prosthesis is known to interfere with speech. Finally, the LBO can be taken out, which accounts for the fact that it was rated as significantly easier to clean.

In conclusion, the majority of patients in this trial were significantly more satisfied with maxillary implant overdentures than with fixed prostheses. The long-bar overdentures appear to provide patients with better speech function and are easier to clean than the fixed prostheses.

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Résumé

Les implants dentaires apportent aux patients des solutions de restauration pour les maxillaires édentés. Tant les prothèses fixées qu'amovibles peuvent être attachées à ces dernières, mais l'efficacité de différents modèles n'a pas encore été déterminée. Dans cet essai croisé intra-individuel en deux sessions, des prothèses fixées sur implants ont été comparées à des prothèses amovibles, sur implants en occlusion avec des prothèses amovibles mandibulaires sur implants. Seize patients ayant reçu précédemment des implants mandibulaires ont pris part à cette étude; quatre à six implants maxillaires ont été insérés. Après des pertes dûes à un manque d'ostéoïntégration et des problèmes liés à la santé générale, treize d'entre eux sont rstés. Parmi ces derniers, cinq ont reçu en premier des prothèses amovibles et huit des prothèses fixées. Après deux mois, les prothèses ont été changées et les secondes prothèses ont également été portées durant deux mois. Des mesures psychométriques de la satisfaction générale envers les prothèses telle que le confort, la facilité de phonation, la stabilité, l'esthétique, la facilité du nettoyage et l'occlusion ont été obtenues après chaque terme. L'aisance de mastication a été testée avec sept types de nourriture. Les prothèses amovibles sur longue barre produisaient une satisfaction générale légèrement supérieure aux prothèses fixées (p = 0,003). Les patients ont également reconnu que leur phonation et la facilité d'entretien étaient bien meilleures avec les prothèses amovibles. Neuf patients ont finalement choisi de garder la prothèse amovible et les quatre autres ont préféré les fixées. Ces résultats indiquent que les prothèses amovibles maxillaires sur implants multiples apportent une plus grande satisfaction aux patients ques les prothèses fixées.

Zusammenfassung

Der Vergleich von festsitzenden und abnehmbaren implantatgetragenen Rekonstruktionen im Oberkiefer: Die Patientenzufriedenheit und ihre bevorzugte Wahl.
Zahnimplantate eröffnen dem Patienten verschiedene Optionen für die Rekonstruktion im zahnlosen Oberkiefer. Man kann sowohl festsitzende wie auch abnehmbare Prothesen auf sie abstützen, aber man hatte bis heute noch keine Aussagen zur Effizienz der verschiedenen Rekonstruktionsmöglichkeiten. In dieser zweistufigen Studie am selben Patienten verglichen wir implantatgetragene festsitzende Oberkieferrekonstruktionen mit abnehmbaren implantatgetragenen Hybridprothesen; die Gegenbezahnung war in beiden Fällen eine implantatgetragene Unterkieferhybridprothese. Man nahm sechzehn Patienten, die vorgängig Unterkieferimplantate inkorporiert erhalten hatten, in diese Studie auf und implantierte zusätzlich vier bis sechs Oberkieferimplantate. Der Studie gingen drei Patienten infolge fehlender Osseointegration und allgemeinen Gesundheitsproblemen verloren, es verblieben 13 Patienten in der Studie. Davon erhielten fünf zuerst die Hybridprothesen, die restlichen acht festsitzende Brücken. Zwei Monate später wechselte man die Rekonstruktionen aus und mit der zweiten Arbeit funktionierten die Patienten für weitere zwei Monate. Nach einer Tragzeit der beiden Rekonstruktionen von je zwei Monaten beurteilte man die allgemeine Zufriedenheit mit psychometrischen Richtlinien: Komfort, Sprachfunktion, Stabilität, Ästhetik, Reinigbarkeit und Okklusion. Die Kaufunktion wurde bei sieben verschiedenen Nahrungsarten getestet. Die abnehmbaren Stegprothesen erhielten in der Beurteilung signifikant bessere Beurteilungen bezüglich allgemeiner Zufriedenheit als festsitzende Arbeiten (p = 0.003). Die Patienten gaben auch der Sprachfunktion und der Reinigbarkeit von Hybridprothesen signifikant bessere Noten. Neun Patienten wollten die Hybridprothesen behalten und vier zogen es vor, mit den festsitzenden Rekonstruktionen zu leben. Diese Resultate lassen vermuten, dass die Oberkieferhybridprothese, auf mehreren Implantaten abgestützt, dem Patienten ein subjektiv besseres Gefühl geben, als festsitzende Rekonstruktionen.

Resumen

Los implantes dentales suministran a los pacientes opciones restauradoras para el maxilar edéntulo. Tanto prótesis fijas como removibles se pueden acoplar a ellos, pero la eficacia de los diferentes diseños no ha sido determinada. En este experimento cruzado intersujeto en dos sesiones hemos comparado prótesis fija maxilar implantosoportada con sobredentaduras removibles sobre implantes opuestas por sobredentaduras mandibulares implantosoportadas. Dieciséis pacientes, que previamente habían recibido implantes mandibulares, entraron a formar parte de este estudio y recibieron de cuatro a seis implantes maxilares. Tras abandonos debidos a ausencia de osteointegración y problemas de salud general, trece permanecieron. De estos, cinco recibieron la prótesis removible primero y ocho la prótesis fija. Tras dos meses, las prótesis se cambiaron y la segunda también se usó durante dos meses. Se obtuvieron mediciones psicométricas de satisfacción general con la prótesis al igual que confort, habilidad para hablar, estabilidad, estética, facilidad para la limpieza y oclusión, una vez que cada prótesis se usó durante dos meses. La habilidad para masticar se valoró para siete tipos diferentes de comida. Las sobredentaduras removibles de barra larga recibieron puntuaciones mas altas que de satisfacción general que las prótesis fijas (p=0.003). Los pacientes también valoraron significativamente mejor su habilidad para hablar y facilidad de limpieza con las sobredentaduras removibles. Nueve pacientes eligieron mantener la prótesis removible y cuatro prefirieron mantener la prótesis fija. Los resultados sugieren que las soredentaduras removibles maxilares en múltiples implantes pueden suministrar a los pacientes con mejor función que las prótesis fijas.

要旨

歯科インプラントは、無歯顎上顎の補綴治療に複数の選択肢を提供するものであり、固定式及び可撤式補綴物のいずれも装着可能であるが、様々なデザインの有効性は証明されていない。本研究では、2回の個人内交差試験を行い、下顎のインプラント支持オーバーデンチャーに対合する上顎において、インプラント固定義歯と可撤式インプラント・オーバーデンチャーを比較した。事前に下顎インプラントを埋入していた患者16名において、4本から6本のインプラントを上顎に埋入した。骨性統合の欠如と全身的健康上の問題で脱落者が出た後、13名が研究に残った。このうち5名は先に可撤式補綴物を装着し、8名は固定式義歯を装着した。2ヶ月後に補綴物を交換し、2個目の補綴物を2ヶ月間装着した。補綴物に対する全般的な満足度、快適さ、発話しやすさ、審美性、清掃及び咬合の容易さに関する心理測定を、各補綴物を2ヶ月間装着する毎に行った。咀嚼能力は7種類の食物で評価した。長いバー構造を備えた可撤式オーバーデンチャーは、固定式補綴物よりも全般的満足度が有意に高かった（p＝0.003）。患者は発話と清掃の容易さについても、可撤式オーバーデンチャーの方が有意に高い能力であると評価していた。9名の患者は可撤式補綴物を装着し続けることを選び、4名は固定式義歯の方を好んだ。これらの結果は、複数のインプラントが維持する上顎の可撤式オーバーデンチャーは、固定式義歯よりも良い機能を患者に提供しうる事を示唆している。

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