

Evaluation of Removable Prosthesis' Functional Quality: A Pilot Study In Cheikh Anta Diop University of Dakar

Moctar Gueye^{1*}, Pape Ibrahima Kamara², Khady Badji², Amadou Toure², El Hadj Babacar Mbodj³

¹Professor, DDS, PhD, Section of Prosthodontics, Department of Odontology, Cheikh Anta Diop University, Dakar, Senegal

²Assistant Professor, DDS, Section of Prosthodontics, Department of Odontology, Cheikh Anta Diop University, Dakar, Senegal

³Full Professor & HOS, DDS, PhD, Section of Prosthodontics, Department of Odontology, Cheikh Anta Diop University, Dakar, Senegal

Original Research Article

*Corresponding author

Moctar Gueye

Article History

Received: 12.03.2018

Accepted: 22.03.2018

Published: 30.03.2018

DOI:

10.21276/sjds.2018.5.3.7



Abstract: The adaptation period to prosthetic wear is accompanied by functional disorders likely to reduce therapeutic success. This study aimed to evaluate patients' assessment of removable prosthesis functional quality. This cross-sectional study related to 51 voluntary patients of the both sexes. The instrument used was a scale of appreciation graduated from 1 to 5. The operator recorded for each question the mark that the patient allotted to his prosthesis on the scale; 1 means the weakest assessment and 5 the highest one. The statistical analysis was made by SPSS Version 16.0 with the risk error of 5 %. The prostheses stability had a score higher than the median for 82.4% of the patients. Prostheses had a satisfactory retention for 78.4% of the sample. Patients who allotted to elocution a note higher than the median accounted for 78.4%. The masticatory effectiveness was satisfactory for 70.7% of the patients. The removable prostheses seem to get a satisfying functional contribution. All the same, the development of reliable evaluation criteria would allow a more objective assessment of the therapeutic success.

Keywords: Removable prosthesis, Function, Quality, Assessment.

INTRODUCTION

The tooth loss is not under control in developing countries, and edentulism which results from it constitutes a physical, psychic and functional handicap. Among the potential therapeutic options to rehabilitate edentulous patients, the removable prosthesis remains the most frequently used means of treatment because of its financial accessibility, the short completion dates and the rare contraindications. The partial or total removable prosthesis aims classically to compensate for the tooth losses and to mitigate the aesthetic and functional deficits observed in the edentulous patient.

However, several patients express complaints and dissatisfactions following the prosthetic treatment. Indeed, the adaptation period to the prosthesis is accompanied by functional disorders among which instability, defective retention, phonatory disorders and masticatory inefficiency. These disorders are susceptible to degrade the patient - practitioner relation and to compromise the chances of treatment success [1-4].

The evaluation of the therapeutic success is seldom carried out in dental practice for lack of consensus on reliable criteria which would enable practitioners to estimate the removable prosthesis quality. This study aimed to evaluate the patients' assessment of removable prosthesis functional quality, in order to improve their welfare and their oral quality of life.

MATERIALS AND METHODS

This was a cross-sectional descriptive study carried out among patients treated between 2008 and 2011 in the clinic of prosthodontics of the Department of Odontology, in Cheikh Anta Diop University of Dakar (Senegal). The prostheses were realized according to the standard protocol by students under the supervision of their professors. The survey related to voluntary patients of both sexes, wearing a full or partial, transitional or permanent removable prosthesis. They received an oral explanation concerning the objectives and the course of the investigator and then agreed to take part in the study by signing the written consent. The patients using a prosthetic adhesive, those who had a re-intervention on their prostheses and those unable to answer clearly our questions were not included.

The variables observed consisted of socio-demographic and local factors (gender, age, type of prosthesis) and functional parameters (stability, retention, phonation, mastication) of the prostheses. The quality of the prostheses was assessed using a scale of appreciation graduated from 1 to 5, realized according to the model of the digital classical visual scale. The operator recorded for each functional parameter the score which the patient allotted to his prosthesis from the graduated scale. The score 1 means the weakest assessment and 5 the highest one; the score equal at least to 3 corresponds to a satisfactory functional quality for the prosthesis. The counted score makes the patient able to express quantitatively the appreciation of the prosthesis quality. It represents for the operator an objective guiding mark and an efficient way to make concrete and analyse the patient's appreciations. A pilot study was carried out to train and grade the investigation, and to evaluate the validity of the questionnaire and the acceptability of procedures and

results.

The collected data were treated in the strictest confidence and by safeguarding patients' anonymity. The statistical analysis was performed using SPSS Version 16.0 software. The variables were described by their frequency, their percentage, their average, their standard deviation, their maxima and their minima. The analytical study used the ANOVA and Pearson tests. The risk of error was fixed at 5%.

RESULTS

The sample consisted of 51 patients including 41 men (80.4%). The sex-ratio was of 4.1. The mean age was 60.1 years with a standard deviation of 10.06. The subjects more than 60 years old accounted for 49%. The patients wearing full removable prosthesis constituted 62.7% of the sample and 37.2% were wearing a partial removable prosthesis or a transitional partial removable prosthesis. The patients wearing permanent prostheses accounted for 82.3% (table 1).

Table-1: Distribution of the sample according to the type of prosthesis

Type of prosthesis	Frequency	Percentage
FRP	32	62.75
PRP	10	19.6
TPRP	9	17.65
Total	51	100

FRP: full removable prosthesis; PRP: partial removable prosthesis; TPRP: transitional partial removable prosthesis.

The stability of the prostheses had a score higher than the median for 82.4% of the sample. The retention of the prostheses was satisfactory for 78.4% of the patients who allocated a score equal to or higher

than 3. The patients who assigned to phonation a score higher than the median accounted for 78.4%. The chewing efficiency of the prostheses was estimated satisfactory for 70.7% of the patients (table 2).

Table- 2: Distribution of the sample according to the scores allotted to the prosthesis

Allotted scores	1	2	3	4	5	Total	
Stability	n	4	5	11	14	17	51
	%	7.8	9.8	21.6	27.5	33.3	100
Retention	n	4	7	10	15	15	51
	%	7.8	13.7	19.6	29.4	29.4	100
Phonation	n	3	8	10	7	23	51
	%	5.9	15.7	19.6	13.7	45.1	100
Mastication	n	7	8	11	6	19	51
	%	13.7	15.7	21.6	11.8	37.3	100

N: frequency; %: percentage

The averages of the functional quality scores were higher among the patients less than 60 years old than among the elder (table 3) and more among the men

than the women (table 4), but the differences were not significant ($p > 0.05$).

Table-3: Average scores of the prostheses according to the age bracket

Age (years)	Stability	Retention	Phonation	Mastication
- 60 (n=22)	3.9	3.8	4.1	3.6
60 and + (n=29)	3.5	3.5	3.6	3.3

$p = 0.176$ (ANOVA)

Table-4: Average Scores of the prostheses according to the gender

Sexe	Stabilité	Rétention	Phonation	Mastication
Male (n=41)	3.7	3.6	3.9	3.5
Female (n=10)	3.7	3.6	3.3	3.2

p = 0.33 (ANOVA)

The age of the patients was significantly correlated with phonation (p = 0.008) and with the mastication (p = 0.02). The type of prosthesis had a significant link with stability (p = 0.037) and the retention (p = 0.037). The permanent partial removable prostheses had best mechanical quality with average scores reaching 4.8.

DISCUSSION

The sample seems small, due to the unavailability of some convened patients or their lack of motivation to take part in the investigation. All the same, it remains more important than in other clinical studies related on average to 20 or 30 patients [5]. The precision of the visual scale used as assessing instrument objectifying the appreciation of the prostheses quality contributes to ensure the relevance and the reliability of the results.

The average age of the patients is closely related to the results reported by other surveys and confirms their conclusions stipulating that edentulism and removable prosthesis wearing are much more frequent among the elderly. Nearly four patients out of five consider that the stability and retention of their prosthesis are satisfactory. Mbodj [2] states that 88% of patients wearing full removable prosthesis allot a satisfactory score for the couple retention-stability. Likewise, Cayrel [3] reveals that the patients wearing partial removable prosthesis are mainly satisfied with the retention and stability. The deficit of retention and lack of stability can be due to imperfect functional impressions, inopportune dental laboratory treatments or the severe and extensive ridge resorption [6,7].

More than three fourth of the sample find their phonation correct after the prosthetic rehabilitation while Cayrel [3] reports that all the patients wearing partial removable prosthesis are satisfied with their phonation. In the same way, the study of Makzoume [8] reveals only 4% of phonatory disorders among the patients wearing full removable prosthesis. The minor scores allotted by the fourth of the sample can be explained by the depression of occluding vertical dimension due to the abrasion of the prosthetic resin teeth assembled on the observed prostheses. Indeed, the acrylic resin does not have qualities of resistance to abrasion essential to preserve durable occlusion. The weakness of the scores among the oldest patients is due to the highest frequency of full removable prostheses in this age bracket.

Less than one third of the patients allocates to the mastication a score lower than the average. This result is closely related to the one by authors [4,9] reporting that the Most prevalent frequently reported were "difficulty chewing". The explanation lies in the rate of partial removable prosthesis whose failing sustentation causes, during the chewing function, depression of prosthetic supporting tissues under the free-end saddles whereas implant fixed partial dentures use leads to more efficient mastication [10,11]. As for the full removable prosthesis, the chewing disorders that they cause are related to the reduction of the occlusal bite force among the totally edentulous. This decrease of the chewing force power is allied to the lack of desmodontal proprioception, the reduction of the masticatory muscles strength, the prosthetic instability during the function and the cuspal morphology of prosthetic teeth. It explains the significant correlation found between the age of the patients and masticatory function quality as well as the higher score among the least old.

CONCLUSION

In view of the high scores allotted by most of patients, the removable prostheses seem to get a satisfactory functional contribution for them. All the same, the elaboration of consensual and reliable evaluation criteria would enable a more objective assessment of the removable prostheses functional quality.

REFERENCES

1. Gueye M, Mbodj EB, Kamara PI. Clinical Profile and Therapeutic Implications on Patients Restored by Removable Prosthesis: A Survey Study in the Department of Odontology of Dakar. *J Dent Oro Surg.* 2016;2:109.
2. Mbodj EB, Seck MT, Ba S et al. Complaints of full removable prosthesis wearers: survey among patients treated in the prosthodontics clinic of the department of odontology of Dakar. *Rev Sen Odontol Stomatol Chir Maxillo-Fac.* 2010;7:33-38.
3. Cayrel C, Braud A, Hüe O. Study of the short-term evolution of satisfaction after the insertion of partial removable prostheses. *Strategie Prothetique.* 2011;11:63-69.
4. Szentpetery AG, John MT, Slade GD, Setz JM. Problems reported by patients before and after prosthodont treatment. *Int J Prosthodont.* 2005;18:124-31.
5. Berteretche MV, Mastari F, Nicolas E, Hüe O. The needs of denture-brushing in geriatrics: clinical

- aspects and perspectives. Gerodontology. 2012;29:768-71.
6. Canger EM, Celenk P. Radiographic evaluation of alveolar ridge heights of dentate and edentulous patients. Gerodontology. 2012;29:17-23.
 7. Hummel SK, Wilson MA, Marker VA, Nunn ME. Quality of removable partial dentures worn by the adult U.S. population. J Prosthet Dent. 2002;88:37-43.
 8. Makzoume J. Phonetic disorders in full removable prosthetics. Cah Prothese. 1998; 103:31-6.
 9. Baran I, Nalcaci R. Self-reported problems before and after prosthodontic treatments according to newly created Turkish version of oral health impact profile. Arch Gerontol Geriatr. 2011;53:e99-105.
 10. Gonçalves TM, Campos CH, Garcia RC. Effects of implant-based 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;30:391-6.
 11. Gonçalves TM, Campos CH, Rodrigues Garcia RC. Mastication and jaw motion of partially edentulous patients are affected by different implant-based prostheses. J Oral Rehabil. 2014;41:507-14.