

Assessment of periodontal health status in temporary partial denture wearers before and after treatment

Meera Theenathayalan¹, S. Kabilamurthi¹, R. Sarah Sathiyawathie^{2*}

ABSTRACT

Aim: The aim of the present study is to compare the oral health status of patients receiving removable temporary partial denture before and after the treatment. **Materials and Methods:** The study comprises totally 27 patients out of which 14 patients reported back, who were prepared to wear RPD (8 were males and 6 were females). Before prosthetic insertion, the periodontal parameters such as plaque indices, probing pocket depth, gingival indices, and mobility of the teeth which come into contact with the denture are recorded. Then, assessment after denture insertion on the periodontal parameters was carried out. **Results:** According to our result statistically, there is no significant difference in plaque accumulation and gingival indices in patients before and after prosthetic insertion in the patients examined. **Conclusion:** If the prosthesis is regularly checked and indicated procedure is performed, the forces transmitted to teeth do not seem to induce periodontal breakdown, and other impact of RPD on periodontal status can also be controlled.

KEY WORDS: Gingival index, Plaque index, Removable partial denture

INTRODUCTION

It is generally considered opinion in prosthodontics that missing teeth are replaced by a prosthodontic appliance. Therefore, for more than half a century, missing teeth have been replaced by fixed or removable prosthetic appliances.

In spite of increasing use of dental implants, the most common way to treat partial or total edentulousness is still by means of a conventional partial or full denture.

A removable partial denture (RPD) is a common treatment available for the restoration of partially edentulous ridges.^[1] Even though spectacular advances have been made to replace missing teeth in the areas of fixed prosthesis and implantology, RPDs have still remained a cost effective and a popular appliance particularly in developing countries such as India. Many studies have been carried out to determine the effect of RPDs on periodontal health.

In general, RPDs have been associated with increased plaque accumulation, gingival inflammation, mobility, periodontal pockets, and marginal bone loss not only on the abutments but also on other teeth.^[2] Several studies have shown increased or continuous periodontal breakdown in patients fitted with partial dentures.^[3] Even though a few studies have demonstrated that the maintenance of good oral hygiene with periodic professional recalls and maintenance therapy have resulted in little or no damage to the periodontal structures,^[4] the overall consensus has been that RPDs are detrimental to periodontal health and are called “gum-strippers.”^[5] Most of the studies have assessed the effect of cast-metal partial dentures; few studies have demonstrated the effects of acrylic partial dentures^[6] which is the common method of replacement of missing teeth in India. This study is to assess the effect of acrylic partial dentures. Fenner *et al.*^[7] and Browning *et al.*^[8] reported an increase in the mobility of abutment teeth and concluded that it has an undesirable effect on the distal extension of an RPD. Many studies have investigated the effect of regular checkups on periodontal health, and most of these studies insisted on periodic recall.^[9-11]

Access this article online

Website: jprsolutions.info

ISSN: 0975-7619

¹Department of Periodontitis, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, Tamil Nadu, India, ²Department of Implantology, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, Tamil Nadu, India

*Corresponding author: Dr. R. Sarah Sathiyawathie, Department of Implantology, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, Tamil Nadu, India. Phone: 9884156513. E-mail: dr.sarahrobin@gmail.com

Received on: 14-06-2019; Revised on: 19-07-2019; Accepted on: 21-08-2019

MATERIALS AND METHODS

Patients who attended the university clinic at Saveetha Dental College and Hospitals, for their RPD were examined, interviewed, and included in this study. The criteria of selection were that patients had worn conventional partial dentures for at least 2–18 months. Patients with systemic diseases or taking regular medications were also included in the study. A minimum of 10 teeth excluding third molars had to be present in the mouth. A total of 14 patients (mean age 54.35 ± 1.5 years, 8 male patients, and 6 female patients) who met these inclusion criteria have been included in this study.

Each of the eligible patients was examined and detailed case history, inclusive of medical status, habits, and oral hygiene practices will be recorded along with the following periodontal parameters were recorded for each tooth present before and after denture insertion:

- The accumulation of gingival plaque using Silness and Loe plaque index (PI).^[12]
- The gingival condition was assessed using the gingival index (GI) of Loe and Silness.^[11]

The comparison of probing pocket depth and gingival indices before and after denture insertion has been done, and statistical analysis has been done using “paired *t* test.”

RESULTS

The subject took part in the study was assessed before and after prosthesis. The mean value found for plaque index before prosthetic insertion (2.06) and after prosthetic insertion was found to be (1.72) which is shown in Table 1 which shows that there is a mild improvement in plaque score.

The mean value found for GI before prosthetic insertion (15.49) and after prosthetic insertion was found to be (18.06) which is shown in Table 2 which shows that there is an increase in gingival score after prosthetic insertion.

However, according to our result statistically, there is no significant difference in plaque accumulation and gingival indices in patients before and after prosthetic insertion which is shown in Table 3.

DISCUSSION

In a study, the periodontal conditions of subjects with different combinations of removable dentures were analyzed in a representative sample of 8000 subjects, of which 90% were included in the study. Subjects with RPDs had significantly more pockets and deeper pockets than those without dentures. The periodontal condition of subjects with a complete

Table 1: Groups=Plaque index

		Paired samples statistics ^a			
		Mean	<i>n</i>	Std. deviation	Std. error mean
Pair 1	Before	2.0679	14	0.95829	0.25611
	After	1.7286	14	0.77700	0.20766

^aGroups=Plaque index

Table 2: Groups=Gingival index

		Paired samples statistics ^a			
		Mean	<i>n</i>	Std. deviation	Std. error mean
Pair 1	Before	15.4929	14	10.32171	2.75859
	After	18.0643	14	5.59390	1.49503

^aGroups=Gingival index

denture in the opposite jaw was significantly better than that in other subjects. This was true in both men and women.^[13]

In a study, using a representative sample of 5028 dentulous Finnish adults, the occurrence of periodontal pockets was studied separately for the maxilla and the mandibles among RPD wearers and non-wearers. The RPDs significantly increased the odds of having periodontal pockets in general (4 mm or more) as well as the odds of having deeper periodontal pockets (exceeding 6 mm). This phenomenon was observed both in the maxillae and in the mandibles. These results suggested that wearing a RPD was a threat to periodontal tissues and that dentists should take care to frequently recall their patients fitted with RPD(s).^[14]

A cross-sectional study, involving 34 patients, recorded four periodontal parameters (plaque index, gingival inflammation, pocket depth, and tooth mobility) revealed significantly better results in patients who subscribed to an annual check as compared with those who failed to pay regular visits to a practitioner.^[7]

There are some limitations in this study. Education, awareness, and motivation during the stage of RPD construction were not assessed in our study. Due to this fact, it is important to stress the point of increasing awareness, level of education and motivation in a similar condition. Furthermore, it may be thought that patients who were included in this study had from the beginning somewhat worse values for the periodontal parameters examined. Therefore, patients who are going to receive RPDs should be carefully motivated and instructed to prevent periodontal diseases. A tidy and simple design of RPD will minimize the accumulation of food debris and plaque on teeth and gingival margins. With carefully planned prosthetic treatment and adequate maintenance of the oral and denture hygiene, little or no damage will be caused to the remaining teeth and their periodontal support.

Table 3a: Groups=Plaque index

		Paired samples test ^a					t	df	Sig. (2-tailed)
		Paired differences							
	Mean	Std. deviation	Std. error mean	95% confidence interval of the difference					
				Lower	Upper				
Pair 1	Before-After	0.33929	0.99734	0.26655	-0.23656	0.91513	1.273	13	0.225*

*No Significant at $P \geq 0.05$ **Table 3b: Groups=Gingival index**

		Paired samples test ^a					t	df	Sig. (2-tailed)
		Paired differences							
	Mean	Std. deviation	Std. error mean	95% confidence interval of the difference					
				Lower	Upper				
Pair 1	Before-After	-2.57143	6.95429	1.85861	-6.58672	1.44386	-1.384	13	0.190*

*No Significant at $P \geq 0.05$

Before the construction of RPDs, periodontal status was not studied. It is too difficult in a hospital-based study with frequent transfers of dentists to follow the same patients over a long period of time. Therefore, we recommend a prospective longitudinal investigation to study the effect of RPDs on the periodontium.

CONCLUSION

In the current study, the periodontal plaque index and gingival indices of the patients wearing RPD do not have any significant change. If the prosthesis is regularly checked and indicated procedure is performed, the forces transmitted to teeth do not seem to induce periodontal breakdown. Although it may be thought that patients who did not follow the recommendation to visit a dentist at least once a year already had from the beginning, somewhat worse values for the periodontal parameters examined. Within the limitations of the current study, it can be concluded that temporary partial dentures do not affect the periodontal status of remaining natural dentition if the patient maintains good oral hygiene habits and visits dentist on a regular basis.

REFERENCES

- Zlatarić DK, Celebić A, Valentić-Peruzović M. The effect of removable partial dentures on periodontal health of abutment and non-abutment teeth. *J Periodontol* 2002;73:137-44.
- Vanzeveren C, D'Hoore W, Bercy P. Influence of removable partial denture on periodontal indices and microbiological status. *J Oral Rehabil* 2002;29:232-9.
- Orr S, Linden GJ, Newman HN. The effect of partial denture connectors on gingival health. *J Clin Periodontol* 1992;19:589-94.
- Yusof Z, Isa Z. Periodontal status of teeth in contact with denture in removable partial denture wearers. *J Oral Rehabil* 1994;21:77-86.
- Owen CP. Diagnosis and Treatment Planning. Fundamentals of Removable Partial Dentures. 2nd ed. Lansdowne (South Africa): University of Cape Town Press; 2000. p.13.
- Walmsley AD. Acrylic partial dentures. *Dent Update* 2003;30:424-9.
- Bergman B, Ericson G. Cross-sectional study of the periodontal status of removable partial denture patients. *J Prosthet Dent* 1989;61:208-11.
- Fenner W, Gerber A, Muhlemann HR. Tooth mobility changes during treatment with partial denture prosthesis. *J Prosthet Dent* 1965;6:520.
- Browning JD, Jameson WE, Stewart CD, McGarrah HE, Eick JD. Effect of positional loading of three removable partial denture clasp assemblies on movement of abutment teeth. *J Prosthet Dent* 1986;55:347-51.
- Bergman B, Hugoson A, Olsson CO. Caries, periodontal and prosthetic findings in patients with removable partial dentures: A ten-year longitudinal study. *J Prosthet Dent* 1982;48:506-14.
- Yap UJ, Ong G. Periodontal considerations in restorative dentistry. Part 2: Prosthodontic considerations. *Dent Update* 1995;22:13-6.
- Ghamrawy EE. Qualitative changes in dental plaque formation related to removable partial dentures. *J Oral Rehabil* 1979;6:183-8.
- Markkanen H, Lappalainen R, Honkala E, Tuominen R. Periodontal conditions with removable complete and partial dentures in the adult population aged 30 years and over. *J Oral Rehabil* 1987;14:355-60.
- Tuominen R, Ranta K, Paunio I. Wearing of removable partial dentures in relation to periodontal pockets. *J Oral Rehabil* 1989;16:119-26.

Source of support: Nil; Conflict of interest: None Declared