The Effects of Two Types of Removable Partial Denture on the Periodontal Health of Abutment and Non-Abutment Teeth

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ABSTRACT
Objective: The use of removable partial denture (RPD) has been implicated in the development of periodontal disease; therefore, it should be properly designed in other to reduce this effect. The objective of this study was to compare the effect of Metal Base RPD and Acrylic Base RPD on the periodontal health of abutment and non-abutment teeth
Methods: This was a one-year prospective study carried out at the Prosthetic Unit of the University of Benin Teaching Hospital, Benin City, Nigeria. The study participants were thirty newly diagnosis partially edentulous patients with acceptable periodontal health (BPE score zero). The participants were randomly allocated into Group A and B. Group A received metal base removable partial denture (MBRPD) while group B received acrylic base removable partial denture (ABRPD). The periodontal status of the abutment and non-abutment teeth were examined after the partial dentures were inserted at baseline, one month, three and six months using the following periodontal parameters: - Plaque index, Bleeding on probing, Periodontal disease index, Miller's classification of tooth mobility and Miller's classification of gingival recession.
Results: The age range of the patients was 24 to 60 years with a mean age of 40.2 ± 11.35 years. There were 9 males (30%) (6 in the ABRPD group, 3 in the MBRPD group) and 21 females (70%) (9 in the ABRPD group, 12 in MBRPD group) with male to female ratio of 1: 2.3. The differences between the abutment and non-abutment teeth in the metal base and acrylic base removable partial denture groups in all the periodontal parameters were not statistically significant except for the mean plaque score at 6 months post insertion. (p=0.002)
Conclusion: ARPD had a more deleterious effect on the periodontal health of abutment and non-abutment teeth than MRPD
Keywords: Removable partial denture, abutment teeth, non-abutment teeth, periodontal disease

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CLINICAL IMPLICATIONS

The use of removable partial denture whether acrylic base or metal base has been shown to have deleterious effect on the periodontal health of abutment and non-abutment tooth. This study revealed that acrylic base removable partial denture accumulates more plaque than metal base removable partial denture, thus resulting in more deleterious effects.

INTRODUCTION

Periodontal disease has been characterized by the destruction of connective tissue and dental bone support following an inflammatory host response to

infection by periodontal bacteria.[1,2,3] The development of periodontitis is dependent on several factors which includes: microbial challenge, genetic risk factors, environmental and acquired risk factors.[4] The use of removable partial denture (RPD) is an acquired risk factor implicated in the development of periodontal disease.[5] These dentures predispose patients to increased plaque accumulation in the mouth; giving rise to periodontal disease which can result in further tooth loss.[6,7]

Chronic periodontitis and gingival recession seen in partial denture (PD) wearers has been linked to plaque accumulation within the various components of RPD.[8] A study that compared patients with RPD, fixed partial dentures and without prosthesis, showed that abutment teeth in RPD wearers had the greatest plaque and calculus accumulation, periodontal probing depth and alveolar bone loss.[6]The presence of a denture in the oral cavity influences the quality and quantity of plaque accumulation around the teeth in the arch where the denture is placed and around teeth in the opposing arch except in situations where the patient carries out meticulous oral hygiene procedures as instructed.[9]

Although studies have shown that acrylic resin base removable partial denture (ABRPD) accumulates more plaque than the metal base removable partial denture (MRPD)[10,11] but no study has showed whether this difference is statistically significant to cause any difference in the periodontium of both groups which this study aims to achieve

Null hypothesis: There is no difference between the effect of metal base removable partial denture and acrylic base removable partial denture on the periodontal health of abutment and non-abutment teeth

MATERIAL AND METHODS

This was a prospective study carried out at the Prosthetic unit of the Department of Restorative Dentistry, University of Benin Teaching Hospital, Benin City; Nigeria from October 2017 to June 2019. The study population consisted of partially edentulous patients randomized into two groups (Group A and B) by use of computer-generated numbers for treatment with RPDs. Group A consisted of partially edentulous patients scheduled for treatment with MBRPD while Group B were those to receive ABRPD. Centrifugal casting technique using Chrome cobalt alloy was used to fabricate the metal base of the MBRPD while compression moulding technique was used to fabricate the acrylic base of dentures in both groups.

Ethical approval (Protocol number ADM/E22/A/VOL.VII/1372) was from the Ethics Committee of the University of Benin Teaching Hospital, Benin City, Nigeria, before the commencement of the study. Inclusion criteria for both groups were consenting partially edentulous patients who presented at the clinic requesting for RPD treatment for missing teeth, had satisfactory oral hygiene, with complete opposing dentition but without supra eruption and without underlying systemic diseases that could affect the periodontium or neuromuscular coordination, while the exclusion criteria were patients with TMJ disorder, systemic disease, parafunctional habits and psychological disorder. Each patient's medical and dental history was thoroughly evaluated followed by a clinical examination of the periodontium by the periodontist. A diagnostic model to check for malocclusion and arrangement of teeth was done for each patient.

A sample size of 16 patients per group was calculated using the formula $n=2z^2pq/d^2$

Z= the standard normal deviate, usually set at 1.96 which correspond to the 95% confidence level. P= this was based a prevalence of 1.8% on a previous study[12], q= 1.0-p d= an observed difference of 0.1 which is considered significant at the 0.05 level

RPD fabricated for all patience was classified using the Kennedy method of classification of removable partial denture:

Class I: bilateral free end saddle

Class II: unilateral free end saddle

Class III: posterioriolly bounded unilateral saddle that has not crossed the midline

Class IV: posteriolly bounded bilateral saddle that has crossed the midline

RPI system of denture design was used for free end saddles while lingual bar and U- shaped major connector were used for mandibular and maxillary major connector respectively. The abutment teeth were those in contact with RPD while other teeth in the mouth were non-abutment.

The periodontal status of the abutment and non-abutment teeth were examined by a periodontist at baseline, 1 month, 3 months and 6 months using the following periodontal parameters: - Plaque index (PI) by Silness and Loe (1964), Bleeding on probing (BOP) by Ainamo and Bay (1975), Periodontal disease index by Ramfjord (1956), Miller's classification of tooth mobility (1985), Miller's classification of gingival recession (1985)

Patience compliance with post insertion instructions and oral hygiene maintenance was satisfactory as the print out of these instructions was given to patience and weekly contacts were made to check on their compliance level. There was no complaint of denture usage from any of the participants hence there was no need for adjustment of any of the denture after insertion.

Data collected was analysed using IBM SPSS version 21 for window. Descriptive statistics in form of frequencies, percentages and mean were used to appraise the data while Chi-square statistics was used to determine the degree of association between bleeding on probing score, gingival recession score, tooth mobility score and periodontal disease index score. The t-test analysis was used to compare the mean plaque index. The level of statistical significance was set at $p<0.05$.

RESULTS

A total of 30 patients who met the inclusion criteria participated in this study. Half of the study patients received metal base removable partial dentures while the other half received acrylic base removable partial dentures. The age range of the participants was 24 to 60 years with a mean age of 40.2 ± 11.35. The study population consisted of 9 males (30%) (6 in the ABRPD group; 3 in the MBRPD group) and 21 females (70%) (9 in the ABRPD group; 12 in MBRPD group) with male to female ratio of 1: 2.3 (Table 1). Majority of the study population in the ABRPD (53.4%) had informal and primary level of education (Table 1). The patients 12 (40%) were mostly unskilled workers. Most 16 (53.3%) of the dentures were placed in the lower arch (9 in the ABRPD group, 7 for MBRPD group) while the upper arch had 14(46.7%) (6 in the ABRPD, 8 in the MBRPD group)

The mean plaque scores of the abutment teeth were higher than non-abutment teeth in both ABRPD and MBRPD groups. The mean plaque scores of the abutment teeth of ABRPD group was higher than that of MBRPD group and the difference was significant at 6 months ($p=0.002$)

(Table 2 and 3). A comparison of the mean plaque index (PLI) for both groups among the abutment teeth showed a significant difference ($p=0.002$) at 6 months while a similar comparison for non-abutment teeth in both groups showed no significant difference ($p\geq0.05$) throughout the evaluations period.

Table 1: Socio-demographic characteristics of the patients

	Denture Types		
	ABRPD	MBRPD	Total
Characteristics	n (%)	n (%)	n (%)
Gender			
Male	6(40.0)	3(20.0)	9(30.0)
Female	9(80.0)	12(80.0)	21(70.0)
Age (years)			
20-29	3(20.0)	4(26.7)	7(23.3)
30-39	5(33.3)	6(40.0)	11(36.7)
40-49	0(0.0)	3(20.0)	3(10.0)
50-60	7(46.7)	2(13.3)	9(30.0)
Occupation			
Unemployed	1(6.7)	5(33.3)	6(20.0)
Unskilled	8(53.3)	4(26.7)	12(40.0)
Semi-skilled	1(6.7)	2(13.3)	3(10.0)
Skilled	4(26.7)	3(20.0)	7(23.3)
Professional	1(6.7)	1(6.7)	2(6.7.0)
Arch			
Upper	6(40.0)	8(53.3)	14(46.7)
Lower	9(60.0)	7(46.7)	16(53.3)
Level of education			
Informal	4(26.7)	1(6.7)	5(16.7)
Primary	4(26.7)	5(33.3)	9(30.0)
Secondary	4(26.7)	2(13.3)	6(20.0)
Tertiary	3(20.0)	7(46.7)	10(33.3)

Table 2: Comparison of mean plaque index (PLI) between the abutment teeth in ABRPD and MBRPD group

Time of Evaluation	Abutment Teeth		P-value
	ABRPD Mean± SD*	MBRPD Mean± SD*	
1 month	1.05 ± 0.30	0.92 ± 0.12	0.073
3 Months	1.75 ± 0.28	1.55 ± 0.29	0.065
6 Months	1.80 ± 0.24	1.48 ± 0.26	0.002

SD=Standard deviation

Table 3: Comparison of plaque index (PLI) between the non- abutment teeth in ABRPD and MBRPD group

Time of Evaluation	Non-Abutment Teeth		P-value
	ABRPD Mean± SD*	MBRPD Mean± SD*	
1 month	0.88 ± 0.13	0.77 ± 0.10	0.068
3 Months	1.32 ± 0.10	1.18 ± 0.18	0.062
6 Months	1.20 ± 0.14	1.18 ± 0.15	0.754

SD=Standard Deviation

The mean plaque scores of the non-abutment teeth of ABRPD group was higher than that of MBRPD group. The difference between the gingival bleeding scores of abutment and non-abutment teeth in the ABRPD and MBRPD groups at 1 to 6 months post denture insertion were not statistically significant (p≥0.05) but the abutment teeth of MBRPD had more bleeding sites than the abutment teeth of ABRPD. The abutment teeth of MBRPD group had more bleeding sites than in the abutment teeth of ABRPD at 3 and 6 months respectively. The non-abutment teeth of ABRPD had more bleeding sites at 3 months while at 6 months the non-abutment teeth of MBRPD had more bleeding sites (Table 4 and 5).

Table 4: Comparison of Gingival bleeding index (GBI) between abutment teeth in ABRPD and MBRPD group

Time of evaluation/ GBI (%)	Abutment Teeth		P-value
	ABRPD n (%)	MBRPD n (%)	
1 Month			
0	15 (100.0)	15 (100.0)	*
25	0 (0.0)	0 (0.0)	
50	0 (0.0)	0 (0.0)	
75	0 (0.0)	0 (0.0)	
3 Months			
0	5 (33.3)	3 (20.0)	0.661
25	0 (0.0)	2 (13.3)	
50	7 (46.7)	8 (53.3)	
75	3 (20.0)	2 (13.3)	
6 Months			
0	1 (6.7)	0 (0.0)	1.000
25	3 (20.0)	4 (26.7)	
50	11 (73.3)	11 (73.3)	
75	0 (0.0)	0 (0.0)	

*No statistics was computed because both variables are constant

Table 5: Comparison of Gingival bleeding index (GBI) between non- abutment teeth in ABRPD and MBRPD group

Time of evaluation/ GBI (%)	Non-Abutment Teeth		P--value
	ABRPD n (%)	MBRPD n (%)	
1 Month			
0	15(100.0)	15(100.0)	*
25	0 (0.0)	0 (0.0)	
50	0 (0.0)	0 (0.0)	
75	0 (0.0)	0 (0.0)	
3 Months			
0	9 (60.0)	9 (60.0)	1.000
25	5 (33.3)	6 (40.0)	
50	1 (6.7)	0 (0.0)	
75	0 (0.0)	0 (0.0)	
6 Months			
0	6 (40.0)	1 (6.7)	0.084
25	9 (60.0)	14 (93.3)	
50	0 (0.0)	0 (0.0)	
75	0 (0.0)	0 (0.0)	

*No statistics was computed because both variables are constant

The periodontal disease was more severe on the abutment and non-abutment teeth of ABRPD than MBRPD; the difference in the periodontal disease index (PDI) in both groups was statistically significant (P=0.001) at 3 and 6 months post insertion respectively. The periodontal disease was worse in the abutment teeth of ABRPD than the abutment teeth of MBRPD and the difference was significant at 3 months (p=0.001) and 6 months (p=0.001) The periodontal disease was worse in the non-abutment teeth of ABRPD than the non-abutment teeth of MBRPD and the difference was significant at 3 months (p=0.001) and 6 months (p=0.001) (Table 6 and 7)

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Table 6: Comparison of periodontal disease index (PDI) between abutment teeth in ABRPD and MBRPD

Time of evaluation/ PDI scores	Abutment Teeth		*P*-value
	ABRPD n (%)	MBRPD n(%)	
1 Month			
0	15 (100.0)	15 (100.0)	*
1	0 (0.0)	0 (0.0)	
2	0 (0.0)	0 (0.0)	
3	0 (0.0)	0 (0.0)	
4	0 (0.0)	0 (0.0)	
3 Months			
0	3 (20.0)	2 (13.3)	0.001
1	8 (53.3)	11 (73.3)	
2	4 (26.7)	2 (13.3)	
3	0 (0.0)	0 (0.0)	
4	0 (0.0)	0 (0.0)	
6 Months			
0	0 (0.0)	1 (6.7)	0.001
1	0 (0.0)	5 (33.3)	
2	0 (0.0)	8 (53.3)	
3	7 (46.7)	1 (6.7)	
4	8 (53.3)	0 (0.0)	

*No statistics was computed because both variables are constant

Table 7: Comparison of periodontal disease index (PDI) between non-abutment teeth in ABRPD and MBRPD group

Time of evaluation/ PDI scores	Non-Abutment Teeth		*P*-value
	ABRPD n (%)	MBRPD n (%)	
1 Month			
0	15 (100.0)	15 (100.0)	*
1	0 (0.0)	0 (0.0)	
2	0 (0.0)	0 (0.0)	
3	0 (0.0)	0 (0.0)	
4	0 (0.0)	0 (0.0)	
3 Months			
0	8 (53.3)	12 (80.0)	0.001
1	7 (46.7)	3 (20.0)	
2	0 (0.0)	0 (0.0)	
3	0 (0.0)	0 (0.0)	
4	0 (0.0)	0 (0.0)	
6 Months			
0	0 (0.0)	5 (33.3)	0.001
1	3 (20.0)	9 (60.0)	
2	12 (80.0)	1 (6.7)	
3	0 (0.0)	0 (0.0)	
4	0 (0.0)	0 (0.0)	

*No statistics was computed because both variables are constant

The tooth mobility index (TMI) was worse on the abutment and non-abutment teeth of MBRPD than ABRPD; a difference that was significant (P=0.001) only at 6 months post insertion. Tooth mobility was worse in the abutment teeth of MBRPD than in the abutment teeth of ABRPD and the difference was significant at 6 months (p=0.001) Tooth mobility was worse in the non-abutment teeth of MBRPD than in the non-abutment teeth of ABRPD and the difference was significant at 6 months (p=0.001) (Table 8 and 9).

Table 8: Comparison of tooth mobility index (TMI) between the abutment teeth in ABRPD and MBRPD group

Time of Evaluation/ TMI scores	Abutment Teeth		*P*-value
	ABRPD n(%)	MBRPD n (%)	
1 Month			
0	15 (100.0)	15 (100.0)	*
1	0 (0.0)	0 (0.0)	
2	0 (0.0)	0 (0.0)	
3	0 (0.0)	0 (0.0)	
3 Months			
0	10 (66.7)	4 (26.7)	
1	3 (20.0)	8 (53.3)	0.107
2	2 (13.3)	3 (20.0)	
3	0 (0.0)	0 (0.0)	
6 Months			
0	3 (20.0)	0 (0.0)	0.001
1	7 (46.7)	8 (53.3)	
2	5 (33.3)	7 (46.7)	
3	0 (0.0)	0 (0.0)	

*No statistics was computed because both variables are constant

Table 9: Comparison of tooth mobility index (TMI) between the non-abutment teeth in ABRPD and MBRPD group

Time of Evaluation/ TMI scores	Non-abutment Teeth		*P*-value
	ABRPD n(%)	MBRPD n(%)	
1 Month			
0	15 (100.0)	15 (100.0)	*
1	0 (0.0)	0 (0.0)	
2	0 (0.0)	0 (0.0)	
3	0 (0.0)	0 (0.0)	
3 Months			
0	11 (73.3)	8 (53.3)	0.449
1	4 (26.7)	7 (46.7)	
2	0 (0.0)	0 (0.0)	
3	0 (0.0)	0 (0.0)	
6 Months			
0	12 (80.0)	7 (46.7)	0.001
1	3 (20.0)	8 (53.3)	
2	0 (0.0)	0 (0.0)	
3	0 (0.0)	0 (0.0)	

*No statistics was computed because both variables are constant

Gingival recession of the abutment teeth in ABRPD was more manifest than in MBRPD at 3 and 6 months post insertion however, at 6 months post insertion in non-abutment teeth of MBRPD gingival recession became worse. The difference between both groups was not statistically significant (p>0.05). The gingival recession was worse in the abutment of ABRPD than in the abutment teeth of MBRPD at 6 months. The gingival recession was worse in the non-abutment teeth of ABRPD than in the non-abutment teeth of MBRPD at 3 months, while at 6 months the gingival recession was worse in the non-abutment of MBRPD than in the non-abutment of ABRPD

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Table 10: Comparison of gingival recession (GRI) between abutment teeth in ABRPD and MBRPD group

Time of evaluation/ GRI scores	Abutment Teeth		*P*-value
	ABRPD n (%)	MBRPD n (%)	
1 Month			
0	0 (0.0)	0 (0.0)	*
1	15 (100.0)	15 (100.0)	
2	0 (0.0)	0 (0.0)	
3	0 (0.0)	0 (0.0)	
3 Months			
0	0 (0.0)	0 (0.0)	0.456
1	10 (66.7)	10 (66.7)	
2	5 (33.3)	5 (33.3)	
3	0 (0.0)	0 (0.0)	
6 Months			
0	0 (0.0)	0 (0.0)	0.379
1	2 (13.3)	4 (26.7)	
2	8 (53.3)	9 (60.0)	
3	5 (33.3)	2 (13.3)	

*No statistics was computed because both variables are constant

Table 11: Comparison of gingival recession (GRI) between non-abutment teeth in ABRPD and MBRPD group

Time of Evaluation/ GRI scores	Non-Abutment Teeth		*P*-value
	ABRPD n (%)	MBRPD n(%)	
1 Month			
0	0 (0.0)	0 (0.0)	*
1	15 (100.0)	15 (100.0)	
2	0 (0.0)	0 (0.0)	
3	0 (0.0)	0 (0.0)	
3 Months			
0	0 (0.0)	0 (0.0)	0.107
1	10 (66.7)	11 (73.3)	
2	5 (33.3)	4 (26.7)	
3	0 (0.0)	0 (0.0)	
6 Months			
0	0 (0.0)	0 (0.0)	0.456
1	10 (66.7)	8 (53.3)	
2	5 (33.3)	7 (46.7)	
3	0 (0.0)	0 (0.0)	

*No statistics was computed because both variables are constant

DISSCUSSION

RPDs have the potential to increase plaque formation on the surfaces of abutment teeth. However, their continuous demand as tooth replacement in partially edentulous patients is because they serve as simple, noninvasive, and cheap treatment option to other categories of treatment in partially edentulous patients.[13]The aforementioned advantages of RPDs notwithstanding several studies have focused on their impact on periodontal tissues.

The age range of the patients in the study was 24-6oyears, it is consistent with the age noted for high prevalence of tooth loss due to periodontal disease and dental caries.[14] This age range corroborates with results of previous studies.[15,16] The preponderance of females in this study could be due to the fact that females are more anxious about their appearance and aesthetic than their male counterparts and hence readily seek dental treatment when needed.[11,17]

It has been reported[18,19] that tooth loss is commonly associated with low socioeconomic class; this could be due to poor oral hygiene and the inability to access or afford restorative treatment. Majority of the patients in this study were similar in the low socioeconomic class

The manifestation of gingival bleeding in both MBRPD and ABRPD group was seen at the third and sixth months post insertion. The number of patients that had gingival bleeding sites at six months was more than those at three months with abutment teeth having more bleeding sites than non-abutment teeth. This finding is in agreement with previous studies that showed that the use of RPD whether metal or acrylic base resulted in gingival bleeding at three and six months post insertion with the bleeding more severe on the abutment than non-abutment teeth.[18,16,20] However, another study showed that patients administered with this types of denture may not present with this condition if oral hygiene is well maintained,[21,22].

The manifestation of periodontal disease in both groups was such that at one month no patient had periodontal disease. This disease condition was more at the sixth month than at the third month with the abutment teeth being more affected than the non-abutment teeth. This effect may not be unconnected with the accumulation of plaque which has been demonstrated to be the aetiology of periodontal disease.[7,10,23] Accumulations of plaque around and underneath the different components of a partial denture are not only responsible for developing chronic periodontitis but can result in gingival recession and root caries.[19,24] Studies[18,25,16] have shown that the introduction of RPD in the mouth results in periodontal disease that affect the abutment more than non-abutment teeth. The periodontal disease on the abutment and non-abutment teeth of ABRPD was worse than that of MBRPD which shows that the ABRPD accumulates more plaque than MBRPD.

At baseline and one month after denture insertion in ABRPD group, all the standing teeth in the mouth had grade 1 gingival recession. More patients had grade II and III gingival recession at the third and sixth months post insertion with some patients having grade III recession in their abutment teeth while there was none in the non-abutment teeth. The observed gingival recession could be attributed to the on-going periodontal disease on the standing teeth. Gingival recession is one of the signs and symptoms of periodontal disease.[26,27] Manifestation of gingival recession in the MBRPD group which was more on the abutment than non-abutment teeth at third and sixth months could possibly be ascribed to early reaction to periodontal disease condition in these patients as a result of plaque accumulation. This validates other studies that showed that the accumulation of plaque around and underneath the different components of a partial denture is not only responsible for developing chronic periodontitis but can result in gingival recession and root caries.[19,24,27] Rests and clasps are usually included in MBRPD in other to provide support, retention and stability, thereby reducing the striping effect of denture on the gingival. This was not the case in this study as many of the patients had gingival recession.

The tooth mobility that was observed at the third and sixth month in both groups could be adduced to the on-going periodontal disease on the standing teeth in the mouth, although the abutment teeth were more affected than non-abutment teeth. This is in agreement with some studies[15,21] that showed that tooth mobility is a sign of on-going periodontal disease, a condition that is seen in patients using RPDs. In dentures with clasps, the insertion and removal of the denture from the denture bearing areas as well as lateral forces generated by them could also result in tooth mobility.[10] This is in contrast to the findings from a study [28] which showed that wearing removable partial denture does not cause detrimental effect on the periodontal tissues, provided that preprosthetic periodontal health had earlier been established and oral health maintained through meticulous oral hygiene behaviour after denture insertion. Similarly, another study showed that the wearing of dentures for three months resulted in healthy tissue suggesting that denture wearing appeared to stimulate keratinization.[11]

In comparing the significant difference between the abutment teeth of both groups with non-abutment teeth, finding from this study indicates that there was no difference at the end of one, three and six months in all periodontal parameters except the mean plaque scores that was different at the end of six months. This shows that the abutment teeth in RPD accumulate more plaque when compared with non-abutment teeth as the duration of denture use increases. It was also observed that the mean plaque score of abutment and non-abutment teeth in the ABRPD group was higher than that in the MBRPD group at every recall period; a clear indication that the ABRPD accumulated more plaque on the teeth present in the mouth than MBRPD. This observation is in agreement with previous studies.[10,11] The physical and structural nature of acrylic tends to encourage plaque accumulation.[29] The ability of ABRPD to promote plaque accumulation is enhanced because the major connector and the denture base tends to cover a large surface area in an attempt to provide additional strength and stability for the denture.

Similarly, collets are a design feature in ABRPD to provide some form of retention and stability for the denture by engaging the interdental areas in the mouth; these encourage plaque formation and food packing which predisposes to periodontal disease in poor oral hygiene.[30]

The ABRPD has been reported to accumulate more plaque than MBRPD,[31] this study revealed that the difference in the level of plaque accumulation between the abutment and non-abutment teeth in three months of denture use was not statistically significant in both denture designs. It therefore means that the difference in periodontal health of the abutment and non-abutment teeth in patients provided with ABRPD or MBRPD is independent of the type of RPD at less than three months of denture use. However, patients' motivation, ability to adhere to post insertion instructions and the maintenance of a good oral hygiene are key factors in the determination of periodontal health. Similarly, poorly designed dentures have been shown to have more damaging effect on the periodontium of the remaining teeth than well design ones.[11] In this study, all the principles of denture design[32] and fabrication were adhered to; hence the dentures did not adversely affect the periodontal health in the studied population. The findings from this study are in agreement with a study[21] that compared the difference in the effect of ABRPD and MBRPD on the natural teeth; they reported that plaque accumulation on the abutment teeth was more than in non-abutment teeth.

Uncontrolled accumulation of plaque around abutment teeth in the mouth of RPD users will predispose to periodontal disease and ultimately

early tooth loss. This was established in a previous study that observed an increased tooth mobility in RPD abutment teeth compared to non-abutment teeth; resulting in the loss of a higher number of abutment teeth compared to non-abutment teeth.[2,33] However, another study showned[34] that follow-up in RPD patients with re-motivation, oral hygiene reinstruction and prophylactic care did not yield significant deterioration in the periodontal status of the remaining teeth; a finding that does not support the concept that the RPD's increases the incidence of periodontal disease. Consequently, with an appropriate design of RPD, good oral hygiene and motivation, it is possible to mitigate changes that may result in periodontal disease of abutment teeth.[31]

CONCLUSION

ARPD had a more deleterious effect on the periodontal health of abutment and non-abutment teeth than MRPD.

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