

Oral health status of patients after replacement of removable partial dentures after three years

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المستخلص

الهدف: يدرس هذا البحث تقييم تأثير الطقم الجزئي المتحرك الاكريلي على الأسنان الطبيعية ومقارنتها مع بقية الأسنان الموجودة في نفس عظم الفك والتحري عن الحالة الصحية لقم المريض.

المنهجية: تتضمن هذه الدراسة أخذ (100) مريض ممن يترددون على: العيادة الإستشارية في المعهد الطبي التقني/ بغداد والعيادة التعليمية في كلية طب الأسنان ومتابعة المرضى خلال ثلاث سنوات. عُدت الأسنان الطبيعية التي تقوم بحمل المشبك المعدني هي الأسنان ذات الإتصال المباشر، أما الأسنان التي تقوم بإسناد قاعدة الطقم (acrylic base) الأسنان ذات الإتصال غير المباشر، فقد عُدت هذه المجموعة من الأسنان الطبيعية ذات الإتصال المباشر وغير المباشر محور الدراسة (study group)، أما بقية الأسنان الموجودة في نفس عظم الفك عُدت مجموعة سيطرة (control group). إن القياسات المختصة بالأسنان قد سُجلت لكل سن وهي: (الطبقة الجرثومية، الحالة الصحية للثة، ومستوى ميلان السن الطبيعي المتصل بالمشبك). قُسم المرضى إلى قسمين: 1. المجموعة المواظبة على الفحص الدوري وعددها (30) مريض؛ 2. المجموعة غير المواظبة على الفحص الدوري وعددها (70) مريض.

النتائج: أظهرت النتائج أنّ الأسنان الطبيعية الحاملة للمشبك المعدني في الطقم الجزئي المتحرك هي أكثر تضرراً من بقية الأسنان الموجودة في نفس عظم الفك في المجموعتين المجموعة غير المواظبة لفحص الأسنان وأنّ المرضى ضمن المجموعة المواظبة أقل تضرراً بسبب متابعتهم الدورية ممّا أدى إلى قلة ضرر الأسنان الطبيعية.

التوصيات: المرضى المرتدين للطقم الجزئي المتحرك يجب أن يحافظوا على الزيارة الدورية للعيادة لغرض فحص الطقم الجزئي المتحرك والأسنان الحاملة للمشبك لتلافي ظهور أي مشكلة، كذلك دعوة لتعين بصورة مباشرة في كشف أي مشكلة عند ارتداء الطقم.

Abstract:

Objective(s): To assess the effect of removable partial dentures on the abutment teeth in comparison with that of the remaining dentition, and to investigate the effect of regular check up on periodontal health for patients using this type of prosthesis.

Methodology: One hundred patients wearing removable partial dentures for at least three years included in the study. Teeth used as direct or in direct retainers for the removable partial denture were considered as the study group, while the remaining dentition in the same jaw was considered as the control group. The following periodontal parameters were registered for each tooth, plaque and gingival indices, clinical attachment level and tooth mobility. Patients were divided into two groups as regular and irregular attendants.

Results: Among the 100 patient, 30 were regular attendants. A significant difference in clinical attachment level and plaque accumulation was detected between study and control group of teeth. In addition there was a statistically significant difference in all periodontal parameters between regular and irregular attendants

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Recommendations: The Patient palaces for removable partial denture must maintain visits so we can check the removable partial denture and supporting teeth for any problem. Also, call for an appointment as soon as you develop any problem with your denture.

Keywords: periodontal removable partial denture

Introduction:

A partial denture is a removable appliance that replaces missing teeth. It is held in place by your existing teeth. It is important that these teeth be healthy in order to support your partial, often they may need treatment prior to making the partial ⁽¹⁾.

An important step in maintaining a healthy smile is to replace missing teeth. When teeth are missing, the remaining ones can change position, drifting into the surrounding space. Teeth that are out of position can damage tissues in the mouth. In addition, it may be difficult to clean thoroughly between crooked teeth. As a result, you run the risk of tooth decay and periodontal (gum) disease, which can lead to the loss of additional teeth ⁽²⁾. A removable partial denture fills in the space created by missing teeth and fills out your smile. A denture helps you to properly chew food, a difficult task when there are missing teeth. In addition, a denture may improve speech and prevent a sagging face by providing support for lips and cheeks ⁽³⁾. Partial dentures are used on patients who still have healthy teeth; the dentures adhere to these healthy teeth with metallic clasps or clear attachments. Partial dentures are typically removable, and this makes cleaning an easy task ⁽³⁾. When a person is initially fitted with partial dentures, they may feel awkward. A person may have difficulty speaking normally, and there may be some discomfort when eating.

The denture wearer may even notice a clicking sound when speaking, or even an increase in saliva, these problems are typically only temporary, and some people are able to speak normally within just a few hours of using partial dentures. Eating usually becomes easier as well, after a little practice ⁽⁴⁾.

Even when partial dentures of the most hygienic design are supplied it is essential that the patients' standards of oral hygiene are of the highest. In fact, it is likely that they need to be even higher than they were prior to the fitting of

the dentures if oral health is to be maintained ⁽⁵⁾. The close correlation exists between oral hygiene and the presence of caries and periodontal disease. They concluded that the success of partial denture treatment would therefore seem to depend to a considerable extent on the patients' co-operation and regular and efficient oral hygiene. It is reasonable to recommend that whenever the patients' standards of oral hygiene are suspect the condition is better left untreated by partial dentures ⁽⁶⁾.

Therefore, patients who are going to receive removable partial dentures should be carefully motivated and instructed in order to prevent periodontal diseases. A tidy and simple design of removable partial denture 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 ⁽⁷⁾.

Methodology

One hundred patients attended the dental department at: 1. waiting halls in the consultant clinic of medical Technical Institute, 2. Dental clinics in the college of medical and health technology. Wearing removable partial denture for at least three years was included in this study. A minimum of 10 teeth including third molars had to be present in the mouth.

Teeth used as direct or indirect retainer for the partial denture was used as a study group, while the remaining teeth in the same jaw were used as a control group. Each of the eligible patients was examined by the same periodontist and the following periodontal parameters were recorded for each tooth present:

Clinical attachment level (CAL) was measured using a Williams Probe and read to the nearest millimeters (mm) at four areas

(mesiobuccal, distobuccal, mesiolingual and distolingual) for each tooth⁽⁸⁾.

The gingival condition using gingival index (GI) of Loe and Silness⁽⁸⁾.

The accumulation of supra gingival plaque using Silness and Loe plaque index (PII)⁽⁹⁾.

Tooth mobility was recorded as follows:

O = no mobility.

I = mobility < 1mm in the horizontal direction.

II = mobility > 1mm in the horizontal direction.

III = mobility in the vertical direction⁽⁹⁾.

A history of attendance to the dental clinic for routine checkup at least once a year was recorded to assess the patient care during the period of using the removable partial denture. Accordingly, the patients were divided into two groups as regular and irregular attendants. Verbal consent was obtained from each of the participants. Statistical analysis was performed using paired t-test. The level of statistical significance was established at $P < 0.05$.

Results:

One hundred patients were examined at 20 clinical visit by one examiner in order to exclude inter-examiner variation. The age of the patient ranged between 25-55 years (mean 40). 30

patients were regular attendants to the dental clinic while 70 patients were irregular attendants.

Table, Figure (1) represents a comparison for all periodontal parameters between abutment teeth and the remaining dentition. The results for (CAL) and (PII) revealed a statistically significant difference between teeth used as direct abutments (study group) and the remaining teeth (control group) in which the P-value was < 0.001 and < 0.03 respectively. While, for the (GI) and mobility, there was no statistically significant difference between the study and control groups of teeth.

Additionally, Table, Figure (2) represents comparison for all periodontal parameters between regular and irregular attendants to the dental clinic during the period of using the removable partial denture. There is a statistically significant difference in all periodontal parameters between regular and irregular attendants. This difference is in favor of regular attendants. However, irregular attendants had a relatively good periodontal health.

Table 1. Comparison of Periodontal Parameter between study and control group teeth

Periodontal Parameter	Study group teeth		Control group teeth		P Value
	Mean	SD	Mean	SD	
CAL*	8.9	2.9	4.5	1.6	0.00
GI**	2.8	0.7	1.5	0.6	0.15
PII***	2.8	0.7	1.5	0.6	0.03
Mob [^]	1.5	0.8	0.5	0.4	0.30

Table 2. Comparison of Parameter between regular and irregular attendants to dental clinic

Periodontal Parameter	Regular attendants		Irregular attendants		P Value
	Mean	SD	Mean	SD	
CAL*	6.5	2.4	9.8	2.6	0.00
GI**	2.5	0.99	3.2	1.5	0.02
PII***	2.2	0.99	3.9	1.7	0.00

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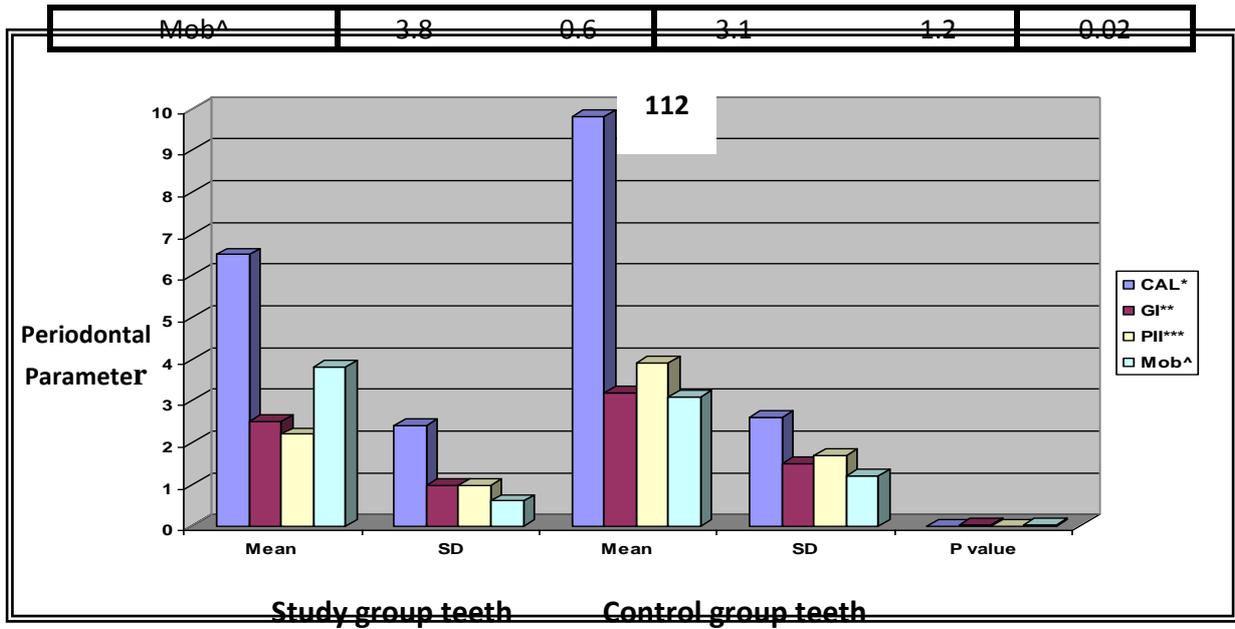


Figure 1. Comparison of Periodontal Parameter between study and control group teeth

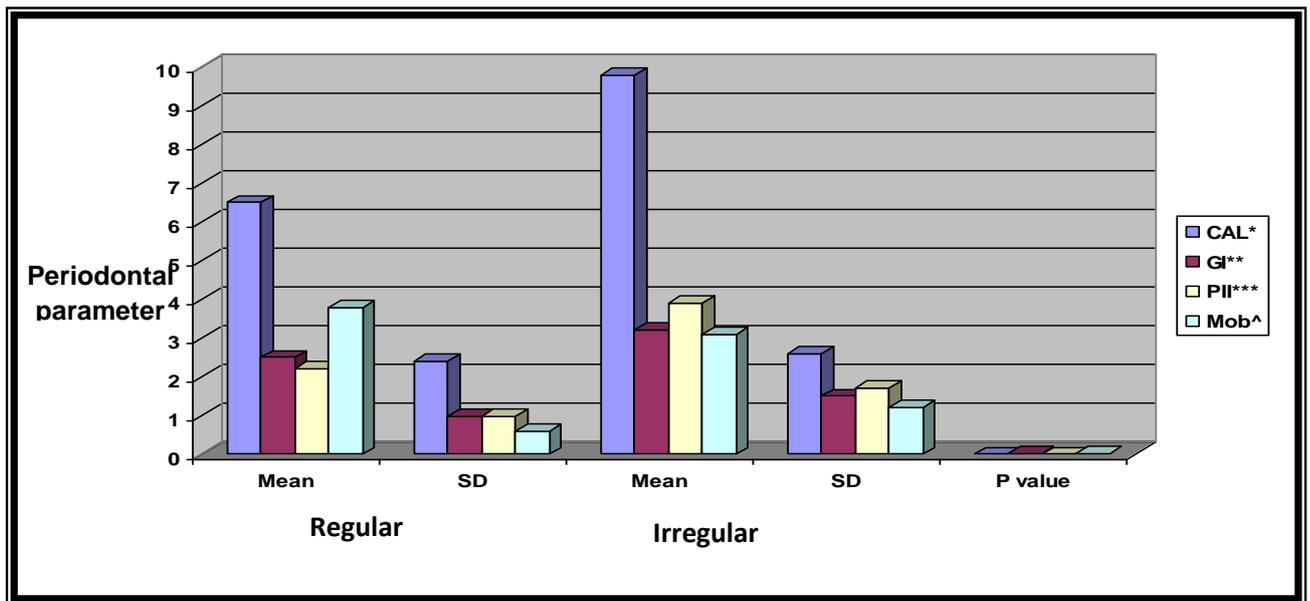


Figure 2. Comparison of Periodontal Parameter between regular and irregular attendants to dental clinic

*CAL: Clinical attachment level

**GI: Gingival index

***PII: Plaque index

[^]Mob: Mobility

The authors concluded that oral hygiene was of primary importance for maintaining oral health when a removable partial denture was present, and was the most important factor for successful removable partial denture treatment. The patient must take care of partial denture for it to last.

Patients also must take care of the remaining teeth so the partial denture can maintain its support⁽¹⁰⁾. It has been reported that the presence of prosthesis in the oral cavity promotes the conditions for establishment and accumulation of microorganisms, as is seen for natural teeth⁽¹¹⁾.

Moreover, the presence of prosthesis in the oral cavity increases the retention sites for microorganisms; this is particularly the case with a removable partial denture, which has a design that favors food retention, biofilm accumulation,⁽¹²⁻¹⁴⁾ either the artificial tooth or the resin base, or even below the clasp arms and the minor connectors. The proximal surfaces adjacent to an edentulous space are lower^(12-13, 15-20).

In this study, clinical attachment level was used because it is a more representative measurement of periodontal ligament destruction than clinical pocket depth. Comparing our results with others showed that our mean CAL, G I, PII, and Mobility (mob) were higher than that reported

by Bergman and Erricson⁽²¹⁾. This difference can be partly explained by the fact that the prevalence of gingival disease in our study population was high. Education, awareness, and motivation during the stage of removable partial denture construction were not assessed in our study. Due to this fact, it is important to stress the point of increase awareness, level of education and motivation in a similar condition. Also, 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 comparing our results with that of Bergmen and Erricson⁽²¹⁾ or Bergmen *et al*⁽²²⁾ must be made with great caution.

Regarding the reaction of the periodontium to removable partial dentures, several studies⁽²²⁻²⁴⁾ reported a variation between extensive to moderate periodontal changes after construction of removable partial dentures. But most of the longitudinal studies have shown that wearing removable partial dentures is a threat to periodontal tissues and lead to increased mobility of abutment teeth^(25,27). If the prosthesis is regularly checked and indicated procedure is performed, the forces transmitted to teeth do not seem to induce periodontal breakdown. The pocket depth was also affected by the placement of removable partial denture since many studies reported an increase in the probing pocket depth following the

use of these prostheses ⁽²¹⁻²²⁾. 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.

Esthetics can be the most important reason motivating patients to seek treatment for replacement of their missing teeth. It has also been found to contribute significantly to their general satisfaction with prostheses ⁽²⁷⁾.

Recommendations:

1. Remove your partial to clean it using a denture brush and tooth paste.
2. Take your partial out when you sleep and place it in water. This lets your gums and teeth rest from the pressure of partial.
3. Maintain your recall visits so we can check your partial and supporting teeth for any problems. Also, call us for an appointment as soon as you develop any problem with your denture.

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