

## Comparing the Effects of Denture Base Materials on Hygiene of Mucosal Denture Bearing Area

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### Key words

flexible denture, denture hygiene, masticatory function.

### Abstract

This study attempted to evaluate the effects of using partial denture on the oral mucous membrane of the denture bearing area between 48 patients attended the private clinic seeking RPD treatment, two types of denture material were used (Hard or heat cured acrylic partial denture and flexible(Nylon) partial denture). Flexible dentures exhibited viscoelastic behaviour that lead to improvement in masticatory function and patients comfort compared with hard dentures. Flexible dentures showed little effects on the mucosa of denture bearing area and little changes on the mucosa, but there were high influences on the soft tissues properties with using hard acrylic denture type. Denture hygiene found mainly fair in both hard and flexible(nylon) denture base materials.

### Introduction

Most of people can see the benefits of partial dentures. After all, they enable to chew and eat more comfortably, pronounce the words more easily and, if missing a tooth or two, they help feel more confident in public. They also help to maintain oral health, as missing teeth can cause longer-term aches and pains by putting extra stress on jaw joints<sup>(1)</sup>. However, even though dentures are a good idea in theory, most people who have them wish they did not have, because in practice, traditional dentures can be uncomfortable and ill-fitting. Over time, as the shape of face and jaw changes dentures become even less comfortable and less suited to the shape of mouth<sup>(2)</sup>. One of the reasons for this was because partial dentures have traditionally been made from very rigid materials. The design of traditional dentures was always aimed at making sure

that they did not change shape or move, because they were tailor-made to fit around existing teeth. They were usually made of metal too, as it was durable, hard-wearing and unlikely to bend or buckle<sup>(3)</sup>. The nylon resin material means that flexible removable partial dentures are much more flexible than traditional metal dentures. They can adapt to the shape and movement of mouth and for this reason, they are far more comfortable to wear. They are also more aesthetic too – nobody will notice that you are missing a tooth as the materials used will suit the natural colours of your teeth and gums. Plus, there are no metal clasps, which can often be visible in traditional dentures<sup>(4)</sup>.

### Materials and Methods

Forty eight patients their age range between (50-70) years old, were participated in this study, they attended the private dental clinics for construction of removable partial dentures. They were divided into 2 groups:

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- Group A: 24 patients with (Hard or heat cured acrylic partial denture).
- Group B: 24 Patients with (Flexible partial denture).
- All patients were examined and evaluated for three months after receiving the dentures.

### Methods of Examination

**1-Clinical examination:** Intra-oral examination of the mucosa of denture bearing area including (color, appearance, sensitivity, bad odor)

**2-Denture hygiene:** Denture examination was done by probe according to Paulo et al. (2002).

**-Good:** Absence of plaque.

**-Fair:** Presence of removable plaque on the inner and/or outer denture surface.

**-Poor:** Presence of non-removable plaque on the inner and/or outer denture surface.

**3-Denture state:** By checking the comfort and patients satisfaction.

**4-Statistical analysis:** Statistical methods, which are used in order to analyses and assess the results of the present study are:

A-Descriptive statistics which include: Tables.

B-Non parametric which includes:

1- Chi – square test. 2- Friedman test.

### Results

Table (1) reveals the effects of two types of dentures on the mucosal changes of denture bearing area, it appeared that significant effects on the oral mucosal changes in case of hard denture, but highly significant in flexible denture. Table (1) showed high percents of denture bearing areas tissues changes in the hard and in flexible dentures were less percents of these changes, normal oral mucosa was detected in flexible denture wearers more than patients with hard denture. Table (2) indicated the relationship between the 2 types of dentures with denture hygiene, no statistically significance was shown in the 2 types of dentures.

### Discussion

From the results of this study it was shown that the use of flexible denture gave a dramatic improvement in masticatory function, comfort and satisfaction compared with hard denture. Denture bearing area mucosa of flexible denture were more healthy with less tissue changes compared with traditional hard one<sup>(4,6)</sup>. Flexible partial denture showed high percent 83.4% with normal appearance, but 8.3% bad odor and 8.3% tissue sensitivity, no signs of tissue color changes or abnormality in the mucosa of denture bearing areas. The nylon resin material means that flexible removable partial dentures are much more flexible than traditional dentures<sup>(5)</sup>. They can adapt to the shape and movement of mouth and for this reason, they are far more comfortable to wear (as well as being much more comfortable to take out and put in). They are also more aesthetic too – nobody will notice that missing a tooth as the materials used will suit the natural colors of teeth and gums. Plus, there are no metal clasps, which can often be visible in traditional dentures<sup>(5)</sup>. Traditional partial dentures showed 58.4% normal appearance (8.3% for each tissue abnormality, tissue color changes and bad odor). Tissue sensitivity was seen 16.7% in this study<sup>(6)</sup>. A partial denture, when properly designed, carefully made, and serviced when needed, can be an entirely satisfactory restoration and serve as a means of preserving the remaining oral structures as well as restoring missing dentition, good periodontal health to the remaining structure<sup>(7,8)</sup>. The presence of a partial denture may increase plaque formation around the remaining teeth, so oral hygiene must receive great emphasis in these patients. It is reasonably fair to assume that the patient will do little better in the long term future than he has done in the past<sup>(9,10)</sup>. Therefore, before and after constructing a partial removable prosthesis, patient must be motivated and maintained his remaining dentition with good oral hygiene to preserve the integrity of the periodontal health<sup>(11,12)</sup>. In short, the authors suggest that people with less than

adequate plaque control should not have partial dentures. However, if a prosthesis must be made, the marginal gingiva should be relieved<sup>(13,14)</sup>. In summary, removable partial denture is an invaluable restorative option to the patient providing the careful diagnosis and treatment planing concerning establishing periodontal health, achieving and maintaining excellent oral hygiene, optimal design and construction of the prosthesis regarding various components and occlusal scheme<sup>(15,16)</sup>. The success of the therapy lies in the hands of the clinician who must be totally competent to render a comprehensive diagnosis of the partially edentulous

mouth and must plan every detail of treatment. Nor can it meet all the requirements of a challenged mouth. The key is to solve and address as many problems and needs as possible in a simple way that is affordable for the patient. An effort has been made to focus on improvements over conventional partials in aesthetics, function, durability, and longevity of a Partial denture made from a flexible denture material. With further improvisations in the working techniques, adjustments and repair potential of the material, Flexible partials y become a simpler answer to complex partially edentulous oral conditions.



- Flexible partial denture



- Mucosa-after treatment

Fig. (1):-A- After treatment, Flexible partial denture-B After treatment, oral mucosa normal.



A- Old Partial



B- New Partial Without Visible Wires

Fig. (2): A-Old Partial denture , B-Flexible(nylon) Partial denture.

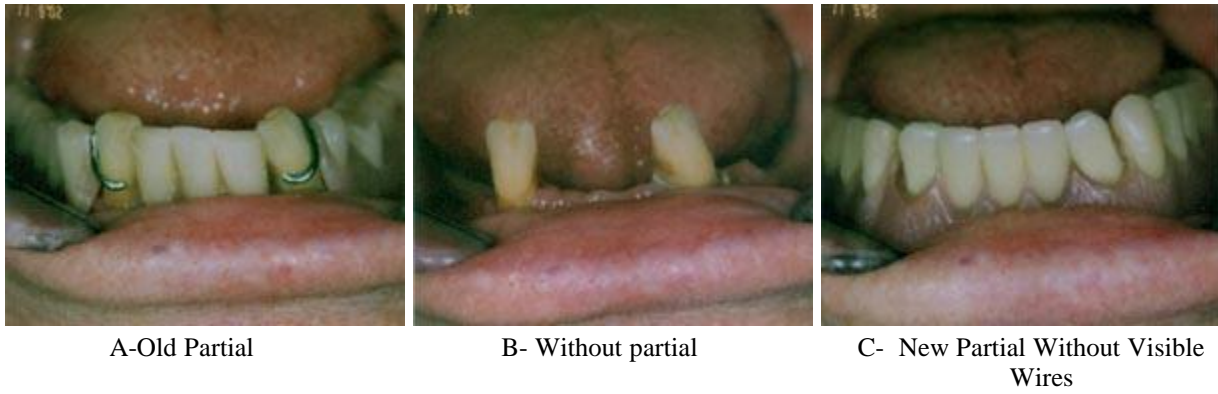


Fig. (3): A-Old acrylic Partial denture B- Without partial C-Nylon partial denture.



Fig.(4): -A-Before and B-After treatment, Flexible partial denture.

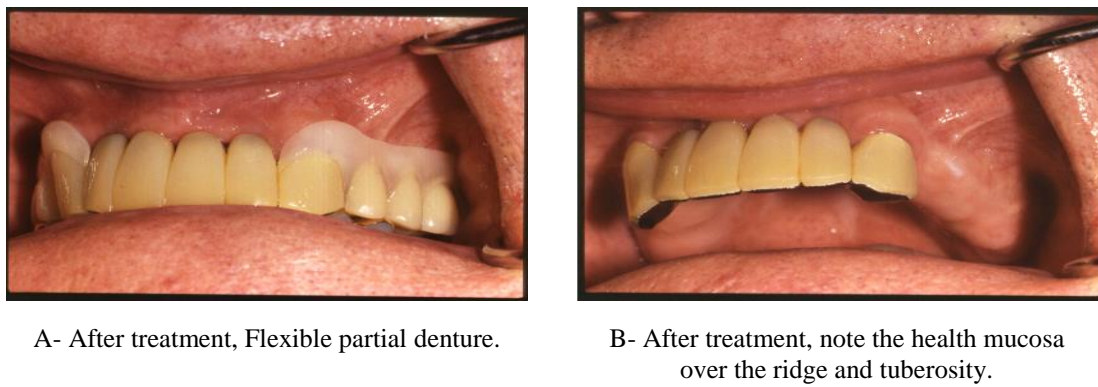


Fig.(5): -A -After treatment- Flexible partial denture B-After treatment, oral mucosa.

Table (1):- The effects of the 2 types of dentures on the oral mucosa

	Groups	No.	Percentage %	Chi-square	Sign.
<b>Hard dentures</b>	<b>Normal</b>	<b>14</b>	<b>58.4</b>	<b>11.33</b>	<b>S 0.023</b>
	<b>Abnormal appearance</b>	<b>2</b>	<b>8.3</b>		
	<b>Tissue color changes</b>	<b>2</b>	<b>8.3</b>		
	<b>Tissue sensitivity</b>	<b>4</b>	<b>16.7</b>		
	<b>Bad Odor</b>	<b>2</b>	<b>8.3</b>		
<b>Flexible dentures</b>	<b>Normal</b>	<b>20</b>	<b>83.4</b>	<b>13.5</b>	<b>H.S 0.001</b>
	<b>Abnormal appearance</b>	<b>0</b>	<b>0</b>		
	<b>Tissue color changes</b>	<b>0</b>	<b>0</b>		
	<b>Tissue sensitivity</b>	<b>2</b>	<b>8.3</b>		
	<b>Bad Odor</b>	<b>2</b>	<b>8.3</b>		

Table ( 2 ):- Relationship between the- 2- types of dentures with denture hygiene .

	Groups	No.	Percentage %	Chi-square	Sign.
<b>Hard dentures</b>	<b>Poor</b>	<b>6</b>	<b>25</b>	<b>1.5</b>	<b>N.S 0.472</b>
	<b>Fair</b>	<b>12</b>	<b>50</b>		
	<b>Good</b>	<b>6</b>	<b>25</b>		
<b>Flexible dentures</b>	<b>Poor</b>	<b>4</b>	<b>16.7</b>	<b>3.5</b>	<b>N.S 0.174</b>
	<b>Fair</b>	<b>14</b>	<b>58.3</b>		
	<b>Good</b>	<b>6</b>	<b>25</b>		

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