

## Original Research

### Assessment of denture retention of three different forms of denture adhesives

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#### ABSTRACT:

**Background:** Despite the rising popularity of dental implants, traditional complete dentures are still the most popular method of treating edentulousness. The present study compared denture retention of three different forms of denture adhesives. **Materials & Methods:** 60 completely edentulous patients of both genders were divided into 3 groups of 20 each. In group I, type I powder denture adhesive was used, in group II, type II powder denture adhesive was used, and in group III, cushion denture adhesive was used. Retention strength (grams) was measured with digital force meter. **Results:** Group I had 11 males and 9 females, group II had 8 males and 12 females and group III had 10 males and 10 females. The mean retention value in group I was 2580.4 grams, in group II was 3426.2 grams and in group III was 1475.2 grams. The difference was significant ( $P < 0.05$ ). The mean retention value in group I was 1578.2 grams, in group II was 2132.6 grams and in group III was 768.4 grams. The difference was significant ( $P < 0.05$ ). **Conclusion:** Type II powder denture adhesive, type I powder denture adhesive, and cushion denture adhesive all had the highest retention values.

**Key words:** Denture adhesive, retention value, mandibular complete dentures

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#### INTRODUCTION

One of the biggest issues in dentistry is the rehabilitation of patients who have no teeth at all. Despite the rising popularity of dental implants, traditional complete dentures are still the most popular method of treating edentulousness.<sup>1</sup> Unfortunately, it has been demonstrated that edentulism and traditional complete denture treatment have a detrimental effect on oral health quality of life. Poor fit dentures are among the most inconvenient issues that complete dentures can cause. Patients with compromised physiological and/or anatomical variables of retention still provide a barrier to conventional complete denture therapy, despite the fact that highly advanced prosthodontics techniques have been proposed to address this issue.<sup>2</sup>

In the 18th century, dental adhesives were first used. To create a substance that could absorb salivary moisture and expand to form a mucilaginous layer adhering to the oral mucosa and dentures, pharmacists

combined plant gums. In prosthodontics, dental adhesives are used to create a binding layer on the removable complete dentures' surface, enabling the latter to cling to the patient's supporting tissues.<sup>3</sup>

Three sizable groupings of materials make up dental adhesives. The first category is made up of the actual adhesives, which include a variety of traditional items like plant gums (karaya, tragacanth, acacia), as well as more modern components made of synthetic and natural polymers (polyethylene oxide, acrylamides, and polyvinyl acetate).<sup>4</sup> Antimicrobial substances including sodium borate, sodium tetraborate, hexachlorophene, propylhydroxybenzoate, and ethanol make form a second class of materials.<sup>5</sup> The present study compared denture retention of three different forms of denture adhesives.

#### MATERIALS & METHODS

The present study consisted of 60 completely edentulous patients of both genders. All were

informed regarding the study and their written consent was obtained.

Data such as name, age, gender etc. was recorded. All subjects received conventional maxillary and mandibular complete dentures with a standard thickness (0.01mm) tinfoil spacer adapted on the master casts before processing into heat cured acrylic resin. All patients were divided into 3 groups of 20

each. Ingroup I, type I powder denture adhesive was used, in group II, type II powder denture adhesive was used, and group III, cushion denture adhesive was used. Retention strength (grams) was measured with digital force meter. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

**RESULTS**

**Table I Distribution of patients**

Groups	Group I	Group II	Group III
Status	Type I powder denture adhesive	Type II powder denture adhesive	Cushion denture adhesive
M:F	11:9	8:12	10:10

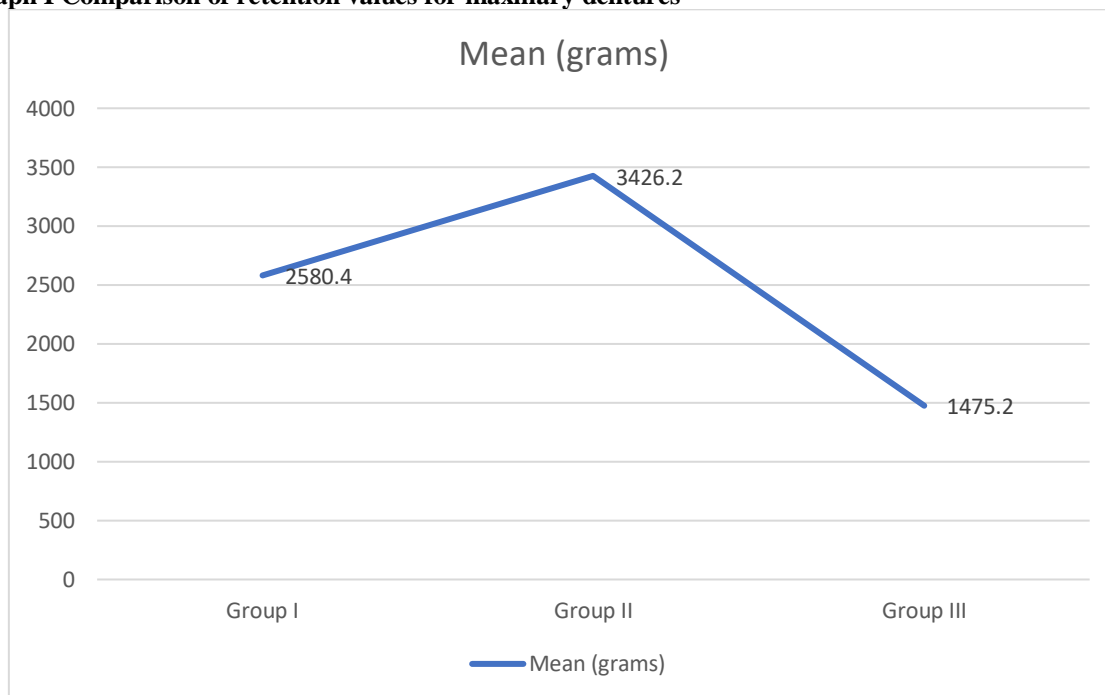
Table I shows that group I had 11 males and 9 females, group II had 8 males and 12 females and group III had 10 males and 10 females.

**Table II Comparison of retention values for maxillary dentures**

Groups	Mean (grams)	P value
Group I	2580.4	0.01
Group II	3426.2	
Group III	1475.2	

Table II, graph I shows that mean retention value in group I was 2580.4 grams, in group II was 3426.2 grams and in group III was 1475.2 grams. The difference was significant (P< 0.05).

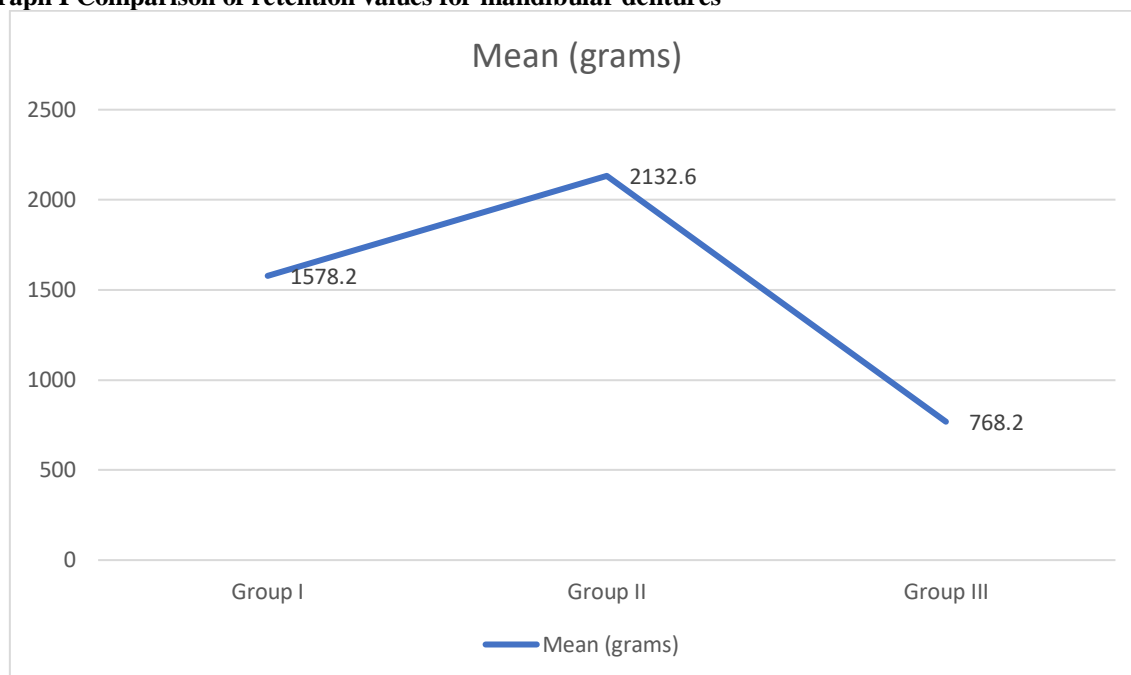
**Graph I Comparison of retention values for maxillary dentures**



**Table III Comparison of retention values for mandibular dentures**

Groups	Mean (grams)	P value
Group I	1578.2	0.01
Group II	2132.6	
Group III	768.2	

Table III, graph II shows that mean retention value in group I was 1578.2 grams, in group II was 2132.6 grams and in group III was 768.4 grams. The difference was significant (P< 0.05).

**Graph I Comparison of retention values for mandibular dentures**

## DISCUSSION

Retention and stability of the mandibular dentures are two of the key issues brought on by full dentures.<sup>6</sup> Dentists and the dentistry industry have long worked to improve denture adherence by creating a variety of "glues" with wildly different compositions and levels of effectiveness.<sup>7</sup> By creating an interface between the oral mucosa and the denture fitting surface, the denture adhesives enable the transmission of retentive forces from the mucosa to the denture through a salivary film. Thus, it uses chemical and physical processes to bind the denture to the underlying oral tissues.<sup>8</sup> Ingredients that expand by absorbing water and becoming viscous and sticky are the main components of adhesive goods. They are offered in a variety of forms, such as powder and paste.<sup>9,10</sup> The present study compared denture retention of three different forms of denture adhesives.

We found that group I had 11 males and 9 females, group II had 8 males and 12 females and group III had 10 males and 10 females. Neill and Roberts<sup>11</sup> reported that the use of denture adhesives provided significant improvement in mastication performance in subjects with poor- and fair-fitting dentures. This improvement of the chewing ability may be related to an increased sense of security and added comfort, even though an adhesive is not required for proper denture retention.

We found that mean retention value in group I was 2580.4 grams, in group II was 3426.2 grams and in group III was 1475.2 grams. Psillakis et al<sup>12</sup> conducted a mixed study involving the use of a gnathometer to measure the force needed to detach the dentures, and the administration of a subjective patient questionnaire to assess chewing, comfort and confidence. A 64% increase in dentures retention was observed when using dental adhesive, and 74% of the

patients reported improved denture function with adhesive. In comparison, a few minutes after placing the adhesive, we recorded an over 10- fold increase in retention strength.

We found that mean retention value in group I was 1578.2 grams, in group II was 2132.6 grams and in group III was 768.4 grams. El N et al<sup>13</sup> did a research on 50 patients with no teeth at all. A questionnaire was used to gauge how patients felt about five commercial complete denture adhesive types (Supercorega paste, Supercorega Powder, Protefix paste, Protefix Powder, and Protefix Cushion) in terms of how well they held their dentures (maxillary and mandibular), how well they could chew, how long they stayed in their mouths, and how simple it was to remove them from the oral mucosa after use. Patient satisfaction revealed a substantial difference in denture retention (maxillary and mandibular), the time the adhesive remained in the patient's mouth, the flavor, and the ease with which it was removed. The direct measurement of dentures retention showed that a significant improvement in dentures retention was observed when the paste type, powder type, or cushion type denture adhesive was used. And that Protefix paste and Protefix powder offers the best retention performance, followed by Supercorega paste and Supercorega powder, and finally Protefix cushion offers the lowest retention performance.

Manes et al<sup>14</sup> evaluated whether the adhesives used to improve complete denture retention are truly effective and able to increase denture adhesion to the mucosa covering the edentulous alveolar ridge of the mandibular dentures. An in vivo clinical study is made of 30 patients with complete mandibular dentures to evaluate the retention afforded by three commercial complete denture adhesives (Benfix®,

Fittydent® and Supercorega®). A spring scale was used to measure retention strength (in grams). The purpose was to determine whether the use of complete denture adhesives is effective, and to establish which commercial brands offer the highest retention strengths. The results obtained indicate that retention is enhanced by the use of such adhesives, and that Fittydent® offers the best retention performance, followed by Benfix® and Supercorega®.

### CONCLUSION

Authors found that type II powder denture adhesive, type I powder denture adhesive, and cushion denture adhesive all had the highest retention values.

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