Denture Adhesive Reduces Food Entrapment Under Removable Full Dentures

 # 1052

gsk GlaxoSmithKline

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Introduction

Denture adhesives have been identified as products which, when used appropriately, have the capacity to enhance treatment outcomes in the edentulous. Adhesives work by hydrating and increasing in volume to fill voids between the dentures and mucosal tissues. It forms a barrier that prevents food from entering the area between dentures and the edentulous ridge. In addition, they increase in viscosity to help optimize interfacial forces that aid in retention.

Bothersome entrapment of food beneath dentures is a common occurrence among wearers of complete dentures. This can lead to discomfort and may also compromise oral hygiene. Use of denture adhesives is reported to improve denture comfort and stability, and to qualitatively reduce food entrapment during eating[1]. However, the literature does not provide abundant support in this area to show that denture adhesives can quantitatively decrease food entrapment beneath complete removable dentures. The current study was conducted to quantitatively assess the ability of adhesives to reduce food from becoming lodged beneath full dentures during eating and to improve objective and subjective measures of denture retention and stability.

Objectives

The aim of this study was to quantitatively assess the ability of adhesives to reduce food entrapment beneath well-fit complete dentures during eating.

Methods

This was a randomized, single center, examiner blinded, 3- way cross over study to evaluate 2 denture adhesive formulas: Super Poligrip® Free (PGF) denture adhesive and an unmarketed adhesive cream formulation (UMC) by GlaxoSmithKline Consumer Healthcare as compared to No Adhesive use. Fifty four edentulous subjects with well made and well fitting maxillary and mandibular dentures completed the study.

Efficacy was evaluated based on: a) objective measures of food occlusion and Kapur Index and b) subjective measurement of denture wobble during mastication with and without denture adhesive. Food entrapment was quantitatively measured by collecting and weighing residue from beneath the dentures after subjects chewed and swallowed 32 grams of a peanut test meal. Secondary outcomes assessed denture retention and stability (Kapur Index as measured by a Prosthodontist) as well as subject self-perceived denture movement during the peanut test meal.

Mixed models were used in the analysis of food occlusion and Kapur Index with period and treatment as fixed effects and subject as a random effect. Pair-wise Dunnett adjustment of multiple comparisons were performed at a 5% level to compare each of the two denture adhesive formulas to the control (no adhesive). There was no statistical comparison between PGF and UMC.

Results

Demographics

32 males, 22 females; Caucasian 79.6%; mean age was 70 years.

Efficacy

Both denture adhesives significantly reduced entrapment of food particles (figure 1), significantly improved examiner-measured retention and stability (table 1) and significantly improved subject self-perceived denture movement. (figure 2) under both maxillary and mandibular well-fit dentures. Figure 3 Illustrates the potential food occlusion benefit of adhesive use; less residual trapped food is evident.

Figure 1 Food Occlusion (weight in grams of recovered peanut particles):
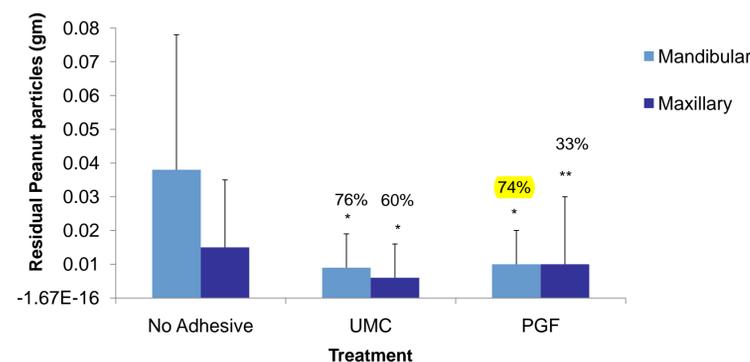
*p<0.0001; **p<0.05
Percent values are the percent reduction in food particles retrieved compared to No Adhesive
Fewer food particles can be beneficial in reducing discomfort

Table 1 Denture Retention And Stability as assessed by examiner using Kapur Index (LS mean ± SD) :

	No Adhesive	UMC	PGF
Maxillary			
Retention	3.78 ± 0.88	4.96 ± 0.19*	4.89 ± 0.32*
Stability	3.00 ± 0.85	3.96 ± 0.19*	3.89 ± 0.37*
Retention + Stability	6.78 ± 1.55	8.93 ± 0.26*	8.78 ± 0.60*
Mandibular			
Retention	3.08 ± 0.95	4.81 ± 0.52*	4.67 ± 0.61*
Stability	2.67 ± 0.82	3.89 ± 0.32*	3.85 ± 0.41*
Retention + Stability	5.74 ± 1.60	8.70 ± 0.79*	8.52 ± 0.93*

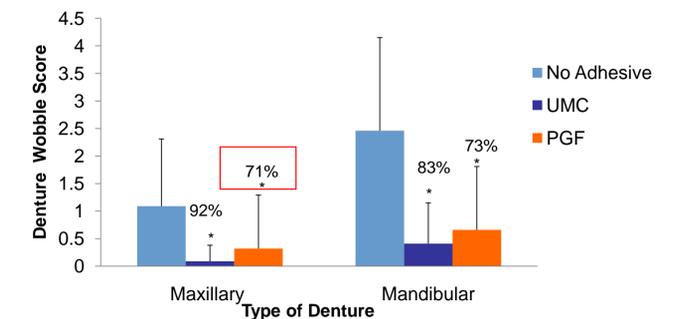•p < 0.0001 compared to the no adhesive group

Retention Scale:
0 = None, 1 = poor, 2 = fair, 3 = good, 4 = very good, 5 = excellent.
Stability Scale:
0 = None, 1 = poor, 2 = fair, 3 = good, 4 = excellent
NOTE: a higher mean indicates better adaptation to supporting tissues

Figure 2 Subjects Self-Reported Evaluation of Denture Movement as perceived during chewing:


*p<0.0001 compared to the no adhesive group
Percent values indicate percent reduction in the denture wobble score compared to the no adhesive group.

Wobble scale:
0 = None, 1 = Barely, 2=mild, 3=moderate, 4 = strong, 5 = very strong, 6 = strongest possible
NOTE: A smaller mean indicates less movement was noted during chewing

Figure 3 residual food post-chewing:
No Adhesive　　　　**with Adhesive**
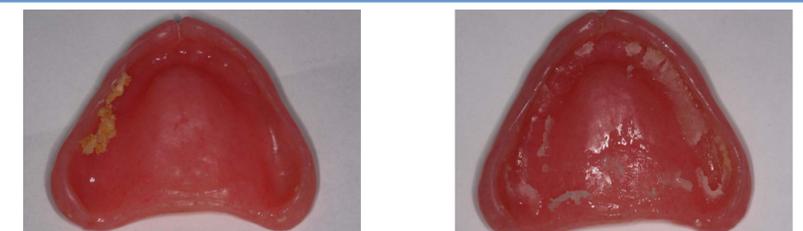
Safety

No treatment related adverse events were reported in subjects for either adhesive.

Conclusions

➤ **Both denture adhesives demonstrated highly significant (p<0.0001) improvements with regard to:**
• prevention of food particles from becoming trapped under both upper and lower full dentures
• examiner rating of denture retention and stability to the edentulous ridge (Kapur Index) in both upper and lower full dentures
• self-perceived subjective ratings of denture stability (denture wobble) in upper and lower full dentures while eating peanuts

Reference
1. Tarbet WJ, Boone M, Schmidt NF. Effect of a denture adhesive on complete denture dislodgement during mastication. J Prosthet Dent 1980; 44: 374 – 378