

DENTURE ADHESIVE - A SOLUTION TO COMPLICATED CASES IN DENTURE: A REVIEW

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Abstract

An endless number of denture wearers and the dentists who fabricate them are using the denture adhesives, just to improve the patient acceptance of comfort with dentures. Then to prosthodontists have a negative attitude towards denture adhesives and assume that to advocate their use is a means of compensating deficiencies in clinical and technical procedures. Adhesives increase denture retention and hence lead to improve chewing ability, reduces denture wobble, improves comfort and reduces amount of food particles collecting under the dentures. Therefore, denture patients should use adhesives on the advice of their dentists and should be instructed in its proper use and cautioned against misuse. All denture patients should be advised to consult their dentists for periodic examinations of their dentures and the health of the oral cavity

Introduction

Earlier adhesives were formulated by mixing vegetable gums which absorbed moisture from the saliva and swelled to a mucilaginous substrate that adhered to the mucosa of the mouth and the denture¹. The main aim in complete denture prosthodontics is to provide dentures that are retentive, stable and comfortable.

In 1967, Kapur conducted a study on twenty six denture wearers and devised a method for scoring denture retention and stability. He concluded that denture adhesives increased denture retention, thereby improving denture wearer's incisive ability.

The denture profession has a very negative attitude towards denture adhesives but contrary to this negative outlook towards these denture adhesives, their use can be a legitimates, therapeutic, effective, augmentative procedure in denture fabrication and treatment.

It is therefore necessary that the dentists know about the denture adhesives for two reasons:

1. To be able to educate all the denture patients about the advantages, disadvantages and the uses of the product, as adhesives are a widely used material and the patients rightfully expect their dentists to be accurately informed about over the counter oral care products.
2. To identify those patients for whom such a product is advisable and /or necessary for a satisfactory denture wearing experience.

History

The use of denture adhesives, fixatives, adherents began about the same time as the age of modern dentistry in the late 18th century. The earliest patent pertaining to

denture adhesives was issued in 1913². The first reference by the American dental association to denture adhesives came from the Accepted Dental Remedies of 1935 in which the council of dental materials, instruments and equipments admitted that these products were non medical³.

Chew and colleagues (1984)⁴ used a kinseographic technique to determine the effectiveness of denture adhesives in improving the retention and stability of complete dentures in vivo.

Composition

The major constituents of denture adhesives are divided in to 3 groups⁵.

Group-1: Materials responsible for the adhesive properties, such as karaya gum, tragacanth acacia, pectin, gelatin, methyl cellulose, sodium carboxy- methyl cellulose and the synthetic polymers. (Polyethylene oxide, acryl amides, acetic polyvinyl)

Group-2: Antimicrobial agents like hexachlorophene, sodium tetra borate, sodium borate and ethanol.

Group-3: Additives, plasticizer, wetting agents and flavouring agent like methanol, oil of wintergreen, and oil of peppermint³. Red dye is used as a coloring agent. Methyl paraben, sodium borate or polyparaben are used as preservatives. To minimize clumping silicone dioxide is used.

Mechanism of Action

Denture adhesives are marketed as pastes, powder or cream. Adhesive powder includes vegetable gums such as acacia, tragacanth or karaya etc. which swells to many times of their original volume by the addition of water and acquires viscous and retentive properties. As water is absorbed by these agents, the resulting anions are attracted to cations in the mucous membrane proteins, producing the stickiness. Saliva increases the viscosity of the adhesive thereby increasing the force required to separate the prosthesis from the oral mucosa.

So Denture adhesives enhance the retentive mechanism through optimizing interfacial forces by:

1. Increasing the viscosity of the medium lying between the basal seat & the denture and also by increasing the adhesive and the cohesive properties^{6,7}.
2. Eliminating the voids between the denture base and the basal seat⁸.

Modern adhesives increase their force by using materials that provide strong bio-adhesive and cohesive forces. Adhesives provide bio-adhesion via carboxyl

groups. However, the cream adhesives when applied spread laterally excluding air and saliva from the tissue surface of the denture.

Biological Response To Denture Bases

With the exception of uncommon allergic reaction to either karaya or paraben, there have been no reports of tissue reaction to denture adhesive products.

The use of denture adhesives provides a cushioning effect, which reduces the amount of food particles collecting under the denture, inhibits growth of candida albicans and assists in the distribution of forces of occlusion over the denture bearing regions, hence minimizing local pressure points⁹.

In addition denture adhesives provide a mucosal protective effect and serve as a bio-bandage and enhance the proprioceptive stimulus of the denture during function. Proper use of denture adhesives will not contribute to bone resorption, changes in vertical dimension, or altered muscle activity during mastication¹⁰.

Characteristics Of An Ideal Denture adhesives

1. It should be odorless and tasteless.
2. It should be easy to apply and to remove from the tissue surface of the dentures.
3. It should be in a powder, cream or gel form.
4. It should be non toxic, non irritant and biocompatible with the oral mucosa.
5. It should provide comfort, retention and stability to the denture, ensuring the patients ability to functional security and effectiveness during speech, mastication and other function.
6. It should retain its adhesive properties for 12-16 hrs.
7. It should not promote microbial growth.

How To Use Denture Adhesives

The correct application of denture adhesives is as follows:

- The denture bearing tissues are wiped and clean of any saliva or food debris.
- Apply small quantities of denture adhesive to the tissue bearing surface of the dentures.
- Wet the denture before application.
- Apply adhesive to the anterior alveolar ridge, in the centre of the hard palate and the posterior palatal area of maxillary denture. For mandibular dentures apply adhesive to the sulcus of denture over the crest of the ridge extending from the anterior region sulcus to the distal extension.
- Seat the denture and hold it firmly by hand pressure for 5-10 seconds.
- Remove the excessive adhesive extending from the denture by gauge.
- Instruct the patient to close the jaw in to centric occlusion several times to distribute the adhesive in an even thin layer between the mucosa and the denture

base.

Indications of the Denture Adhesives

A. At the time of clinical procedures being done

B. Indenture after care

A. At the time of clinical procedures being done:

a. **Stabilization of the trial denture bases while making the jaw relation records:** The jaw relation records essentially require stabilized trial denture bases. Trial denture bases fabricated from base plate, autopolymerizing acrylic resin etc does not demonstrate adequate retention and stability. So the discrete use of denture adhesive will stabilize the denture base for accurate evaluation of jaw relation records.

b. **At the time of final try in :** Final trial with unstable and unretentive denture base makes the verification of jaw relation records difficult or inaccurate. Aesthetic and functional assessment such as teeth arrangement with respect to arch form, high lip line and smile line, occlusion plane etc will be compromised if the trial denture is unstable. So the judicious use of denture adhesive will do a remarkable job in reducing patients apprehension and improving the accuracy of the trial denture.

c. **Insertion of the dentures :** Although the denture adhesives should not be relied to correct deficiencies in denture fabrication. Patient with compromised denture bearing areas can be benefited with the use of denture adhesives as it helps in overcoming anxiety to new denture and increases their ability to adopt to new denture particularly during immediate post insertion adjustment phase.

d. **Immediate dentures :** Due to the soft tissue healing and bone resorption, the immediate dentures soon become loose, advocating to its relining and rebasing or a new denture fabrication. During this interim period denture adhesive or soft tissue liner can augment the retention, comfort and function of immediate denture.

B. Use of denture Adhesives in Aftercare

a. **Reduction of tissue irritation:** It reduces clinical findings of tissue irritation, compression ulcers, and inflammation of oral mucosa of denture wearers. Therefore denture adhesives are indicated in patients with sensitive oral mucosa as they help to alleviate the discomfort of tissue irritation.

b. **In patients with systemic diseases :** Patients suffering from xerostomia either due to drug or radiotherapy can be benefited with the use of denture adhesives and also in disorders in which muscle control is affected like Parkinson's disease, Alzheimer's disease & myasthenia gravis etc. Patients may stabilize their dentures with the denture adhesives.

c. **Maxillofacial surgery patients :** Denture adhesives are used to retain large prosthesis in edentulous patients with the gross jaw defect and also beneficial to

those edentulous patients treated with an immediate prosthesis at the time of surgical resection.

- d. Administration of drug therapy :** Denture adhesives are a valuable adjunct for retention of prosthesis designed for administration of drug therapy to oral tissues designed as radiation carriers or radiation protective prosthesis.

Contraindications

1. Patients allergic to denture adhesives or components of adhesives preclude its use.
2. Denture that is grossly inadequate in dimension and function.
3. Denture that demonstrates excessive loss of vertical dimension because of the bone resorption and soft tissue shrinkage.
4. Patients with the broken dentures with missing flange or with sectional fractures should not use denture adhesives to retain their dentures.
5. Patients who use denture adhesives without thoroughly cleaning of the previously used adhesive resulting in a lining of a layered caked deposit of hardened adhesive should be discouraged from the further use of denture adhesive.

Conclusion

Denture adhesives when used in a proper way are beneficial and safer to the patients in improving retention and stability, incisive ability, comfort and function and provides psychological security. Increasing incidences of chronic residual ridge resorption and a consequent increase in unstable denture because of variables beyond the control of dentist and patient warrants a new perspective on the use of denture adhesives as an adjunct to denture treatment and aftercare. Patients should be instructed to its proper use and cautioned against its misuse

References

1. Kapur K.A Clinical Evaluation of denture adhesives. J. Prosthet Dent. 1967; 18 (6), 550-8.
2. Yankell S.L Overview of Research and literature on denture adhesives. compend. contin educ Dent 1984, (supple 4): 518-21.
3. American Dental Association . Accepted Dental Remedies . Chicago : American Dental association 1985 , 172
4. Chew CI , Phillips RW ,Boone ME ,Swartz ML , Denture stabilization with adhesives A Kinesiographic study. Dental education 1984; 4 (suppl) , 532-8 .
5. Polytoxis GL . An update on denture fixatives .Dent update 1983; 579 .
6. Barbenel JC : Physical retention of Complete Dentures. JPD 1971 ; 76: 592-600 .
7. Lindstrom RE . Pawelchak J.,Heyd A. Tarbert WJ . Physical chemical aspects of denture retention and stability : A review of the literature JPD 1979 ; 29 : 17-19 .
8. Stafford GD Denture Adhesive- A review of their uses and composition Dental Practit 1979 ; 21 : 17-9
9. Tarbett WJ , Boone M, Schmidt NF . Effect of a denture adhesive on complete denture dislodgement during mastication. JPD 1980 ; 44 : 374-8 .
10. Boone M . Analysis of soluble and insoluble denture adhesive and their relationship to tissue irritation and bone resorption . compend . Contin Educ Dent 1984 ; Suppl 4: 522-5

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