



Management of Loose Dentures by Chemical Retention

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ABSTRACT

Denture Adhesive is a material used to adhere a denture to the oral mucosa. The use of denture adhesives has increased in today's world.

Denture Adhesives are used by denture wearers to improve chewing ability, provide comfort and eliminate the accumulation of food debris beneath the dentures.

However, it must not be used as an aid to compensate for deficiencies in denture fabrication. With proper use and maintenance of both oral and denture hygiene, denture adhesives can bring about great satisfaction to the patients. This article describes denture adhesives and its uses in dentistry.

INTRODUCTION

Edentulism is the condition of being toothless to a certain degree. Dentures are removable dental prostheses that replace partial or entire dentition and associated structures of maxilla and mandible. With the loss of teeth, there is a decrease in vertical dimension as the mouth is allowed to over close when there are no teeth present to block further upward movement of mandible towards maxilla. Due to this, the dentures can become loose over time with changes in the bone and supporting gum tissue. As a remedy for this, denture adhesives come into play. "Denture adhesive" is a commercially available, non toxic, soluble material of sticky nature that can be applied over tissue surface of the denture in order to enhance the quality of denture retention and

thereby improving quality of denture stability too. Denture adhesives increase the retention^{1,2}, comfort and improve function.

They also provide satisfaction and psychological confidence to the patients regarding their dentures³. The following is a description of denture adhesives and its uses in dentistry.

COMPOSITION

The ingredients present in a denture adhesive falls under either of the three following groups:

1.ADHESIVE AGENTS

Tragacanth, gelatine, methyl cellulose, acacia, hydroxyl methyl cellulose, karaya gum, pectin, sodium carboxyl methyl and synthetic polymers like acrylamides, acetic polyvinyl and polyethylene oxide.

2.ANTI-MICROBIAL AGENTS

Sodium tetra borate, ethanol, hexachlorophene and sodium borate.

3. OTHER AGENTS

Plasticizing agents, flavouring agents like oil of peppermint, oil of wintergreen and wetting agents, etc.

MODE OF SUPPLY

The usage of denture adhesives dates back to late 18th century. Initially, denture adhesives were formulated by mixing vegetables. The mixed vegetables form a substratum which sticks both to the tissues and to the prosthesis. In today's world, denture adhesives are available as

- Paste
- Powder
- Cream
- Strips
- Wafers

MODE OF ACTION**1 ACTION OF POWDER**

Adhesive powders absorb water and swell up several times to their original size/volume and form anions which interact with cations present in proteins of oral mucous membrane.

2 ACTION OF PASTE

These materials provide stronger bio adhesive and cohesive forces. On hydration, they form free carboxyl groups which form electrovalent bonds with the tissue.

3 ACTION OF CREAM

The increased viscosity results in lateral spread excluding air and saliva thereby increasing the retention.

The action of strips and wafers are analogous to that of a double sided tape.

REQUIREMENTS⁴

- i. The material should be biocompatible, non-toxic and non-irritant.
- ii. The material should have neutral odour and taste.

- iii. The application and removal of material from the tissue surface of the denture must be easy.
- iv. The material should discourage microbial growth.
- v. The adhesiveness of the material should be retained for 12-16 hours.
- vi. It must fulfil its primary purpose-to increase the comfort, retention and stability of the denture.

MODE OF APPLICATION

The steps involved in applying a denture adhesive is as follows:

- i. Food debris on the tissue surface of the denture is wiped off.
- ii. Wet the denture before application.
- iii. Adhesive is applied in small amounts over the tissue bearing surface of the denture. In maxillary denture-anterior alveolar ridge, centre of palate and posterior palatal seal region. In mandibular denture-over the entire sulcus.
- iv. Denture should be seated and held in place firmly by hand pressure for 5-10 seconds.
- v. Excess adhesive is removed by gauze; patient is advised to close in centric occlusion several times to spread the adhesive as thin even layer.

INDICATION⁵

- Severely atrophied edentulous ridges
- Used to stabilize the trial denture bases which show inadequate retention and stability.
- Denture adhesive increases denture try-in accuracy and decrease the patient apprehension about the fit of the final prosthesis.
- It provides comfort and function during the interim period.
- It is used to stabilize dentures in patients with neuromuscular disorders.
- It is used to rehabilitate gross maxillofacial defects for retention.
- Used by high profile patient for psychological security in social situations.

CONTRAINDICATION

- It is not used in case of allergies to adhesives or any of its components.
- Must not be used in excessive bone resorption and soft tissue shrinkage leading to loss of vertical dimension.
- Should not be used to retain fractured denture or dentures with lost flanges.
- Patients with poor oral or denture hygiene must avoid the use of denture adhesive.
- Must not be used in case of gross inadequacies in retention and function.

ASSOCIATED PROBLEMS

In some patients, there is reported problem of xerostomia due to over usage of denture adhesives. Some patients find it difficult to maintain proper oral and denture hygiene. Another adverse effect linked to usage of denture adhesive is zinc toxicity.

Zinc is a mineral that is essential for good health of the body. But excess of zinc in the body can lead to health problems such as nerve damage especially in hands and feet. This damage appears slowly over a long period of time.

ADVICE FOR PATIENTS

- Strictly follow the instructions provided with the adhesive.
- Do not use more adhesive than recommended. Start with the small amount of adhesive initially.
- If the patient experiences numbness or tingling sensations, stop the use and consult the dentist.
- Speak to the dentist regularly intervals regarding the fitting of the dentures.

CONCLUSION

In India, conventional denture prosthesis is still a treatment of choice for the majority of people in rural areas. The use of denture adhesives in providing adequate retention in those patients facing problem of denture retention will be a viable solution. However the patients must be

warned about the ‘use and misuse’, and ‘do’s and don’ts’ related with the applications of denture adhesives to enjoy best possible results without threatening the health of oral tissues. The patient should be informed about the importance of frequent “Recall appointments”⁶, and reason for the evaluation of the condition of denture and foundation, for assuring best quality services by complete denture to mankind.

With proper guidance and use, denture adhesives can be beneficial to the patient in increasing retention and stability, enhanced comfort, improved function and in providing psychological satisfaction. However only properly fabricated dentures should be used and the adhesives are not a way to compensate for denture deficiencies.

REFERENCES

1. Kapur KK. A clinical evaluation of denture adhesives. *J Prosthet Dent.* 1967;18:550–8.
2. Figueiral MH, Fonseca PA, Pereira-Leite C, Scully C. The effect of different adhesive materials on retention of maxillary complete dentures. *Int J Prosthodont.* 2011;24(2):175–7.
3. Slaughter A, Katz RV, Grasso JE. Professional attitudes toward denture adhesives: A Delphi technique survey of academic prosthodontists. *J Prosthet Dent.* 1999;82(1):80–9.
4. Adisman IK. The use of denture adhesives as an aid to denture treatment. *J Prosthet Dent.* 1989;62(6):711–5.
5. Jagger DC, Harrison A. Denture fixatives—an update for general dental practice. *Br Dent J.* 1996;180(8):311. doi: 10.1038/sj.bdj.4809071.
6. Woelfel JB, Winter CM, Curry RL, Columbus BA. Additives sold over the counter dangerously prolong wearing period of ill-fitting dentures. *J Am Dent Assoc.* 1965;71:603–613.