



Review article

Denture Adhesives Revisited

Yeshwante Babita¹, Choudhary Neha^{2*}, Baig Nazish³, Gaurav Tated⁴, Kadam Pranit⁵

¹ Professor & HOD, Department of Prosthodontics, CSMSS Dental college, Aurangabad, Maharashtra, India

² MDS 2nd Years Student, Department of Prosthodontics, CSMSS Dental college, Aurangabad, Maharashtra, India

³ Professor, Department of Prosthodontics, CSMSS Dental college, Aurangabad, Maharashtra, India

⁴ MDS 2nd Years Student, Department of Orthodontics, CSMSS Dental college, Aurangabad, Maharashtra, India

⁵ MDS 3rd Years Student, Department of Prosthodontics, CSMSS Dental college, Aurangabad, Maharashtra, India.

ABSTRACT

Denture Adhesives are material used to adhere a denture to the oral mucosa. It is available either in soluble (powder, cream, liquid) or insoluble form (home relines kits, denture pads (synthetic wafers), paper or cloth pads, and moistened tissue paper). The present review relates to a denture adhesive their composition, mechanism of action and describe the newer agents used along with the advantage and disadvantage according to the literature

KEY WORDS: Denture Adhesives, composition, mechanism of action.

INTRODUCTION

Denture Adhesives are material used to adhere a denture to the oral mucosa.[1] It is available either in soluble (powder, cream, liquid) or insoluble form (home relines kits, denture pads (synthetic wafers), paper or cloth pads,

and moistened tissue paper. In 1960s the adhesives used were mainly vegetable gums like karaya, tragacanth, xanthan and acacia. The problems with them were High water solubility especially when hot stuffs were consumed, also it was short lived and act as allergen

Table 1: Composition of Denture Adhesives

S No	CONTENT	EXAMPLE
1.	Adhesive	<ul style="list-style-type: none">• Sodium carboxymethyl cellulose (CMC) - short acting.• Polymethyl vinyl ether-maleic anhydride (PVM-MA/Gangtrez)-long acting – PVM-MA with divalent salts of sodium, calcium & zinc.• Combination of CMC & divalent salts of PVM-MA.• Polyvinylpyrrolidone (povidone).
2.	Binders	Petrolatum, mineral oil, polyethylene
3.	Anticlumping agents	silicone dioxide, calcium stearate
4.	Flavouring agents	menthol, peppermint oils.
5.	Colouring agents	red dye
6.	Preservatives	methyl paraben, poly paraben

Mechanism of action of denture adhesives

Water is adsorbed by the adhesive agents the material swells up to 50 to 150 percent by volume, filling in spaces between the prosthesis and the tissues. In the presence of water anions are formed, the resulting anions are attracted to cations in mucus membrane proteins, producing the stickiness. The properties of current adhesives depend on a combination of both physical and chemical forces.

Physical force – the cohesive force is responsible for adhesion. Most adhesives use ingredients that provide bioadhesion (chemical forces) via carboxyl groups. As the adhesive hydrates, free carboxyl groups form electrovalent bonds that produce the stickiness[2].

NEWER PVM-MA ADHESIVES

1. Combined divalent salts of PVM-MA, specifically calcium salts, with CMC to make denture adhesives. CMC produced immediate effect and divalent salts increased the effect by (i) reducing the rate of dissolution, (ii) increased the cohesive force by cross linking matrix of CMC.
2. Combined PVM-MA zinc and calcium salts with CMC. These materials provided even greater cohesive strength for longer durations because of the stronger covalent bond that develops via the divalent zinc cation[3].

Patient education

It is important to tell the patient the proper usage and the time when it is not to be used, and proper cleaning instructions. Discomfort, Pain, soreness cannot be corrected by using the adhesive.

Table 2: Comparison of different forms of Denture Adhesives.

S.No	ACTIONS	POWDER	CREAM
1.	Effect	Immediat, short lasting	long lasting effect, more effective than the powder
2.	Applications	applied on a wet denture	applied on dry denture surface

Table 3: Properties along with advantages and disadvantages of Denture Adhesives from review of literature

SOURCES/YEAR	Advantage	Disadvantage
Tarbet,Grossman,1980[4]	Reduce likelihood of irritation,increase retention,provide psychological benefits	Not listed
Tarbet et al,1981[5]	Increases retention, stability, biting force	Not listed
Polyzois 1983[6]	Secure immediate or new dentures Apply medicine to oral mucosa Simplify placement for specific patients Patients with xerostomia Geriatric patient Patient with poor muscle tone	Not for patient who have ill fitting dentures or those who tend to overuse it
Adisman 1989[7]	Stablize deture in older patient Stabilize trial bases during try in Enhance denture service Improve stability and function in well experienced person Improve function Provide cushioning Provide comfort	Ill fitting Allergic unhygienic

Shay 1991[8]	Improves retention, stability Improves denture bearing surface Improves chewing stability Improves oral anatomy of patients who are not surgical candidate Simplify placement for patient with movement deficits	Ill fitting Immediate dentures
Grasso et al 1994[9]	Reduces vertical or mediolateral movement Improves retention, stability and chewing ability Provides better incisal biting forces	Ill fitting dentures

CONCLUSION

Denture adhesive their composition, mechanism of action and the newer agents used along with the advantage and disadvantage according to the literature should be kept in mind while using the adhesives for the judicious use.

REFERENCES

1. Kenneth Shay, Denture Hygiene A Review and Update, The Journal of Contemporary Dental Practice, 2003; 2:187-196.
2. George A. Zarb, Charles L. Bolender, Judson C. Hickey, Gunnar E. Carlsson: Boucher's prosthodontic treatment for edentulous patients, ed 12, B.I Publications Pvt Ltd.
3. Sheldon Winkler: Essentials of complete Denture Prosthodontics ed 2, Ishiyaku Euro America Inc 1945, pp 345-347
4. Tarbet WJ, Grossman E. . Observations of denture-supporting tissue during six months of denture adhesive wearing J Am Dent Assoc. 1980 ;101(5):789-91.
5. Tarbet WJ, Silverman G, Schmidt NF. ,wearers as influenced by adequacy of denture-bearing tissues and the use of an adhesive. 1981 ;60(2):115-9.
6. POLYZOIS, G. L Journal of Oral Rehabilitation, The wearing of complete dentures: guidance to patients 10: 229-235. doi: 10.1111/j.1365-2842
7. Adisman, IK. The use of denture adhesives as an aid to denture treatment. J Prosthet Dent. 1989;62:711-715.
8. Shay, K. Denture adhesives: choosing the right powders and pastes. JADA. 1991;122:70-76
9. Grasso, JE. Denture adhesives: changing attitudes. JADA. 1996;127:90-96.

*Corresponding author: Dr.Choudhary Neha
Email: drnehacul@gmail.com