

Denture Adhesives in Complete Denture Care: Benefits, Limitations and Safe Use - A Narrative Review

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Abstract: Denture adhesives can help patients who need additional retention and confidence while wearing complete dentures. However, their role is sometimes misunderstood. Some patients use them without professional advice, while some dentists consider their use a sign of poor denture treatment. This narrative review discusses how denture adhesives work, their effects on denture function, their limitations and their safe use. Published clinical studies generally support improvements in retention and resistance to denture movement. Findings for chewing performance, overall satisfaction and oral health-related quality of life are less consistent. The benefit depends on the outcome measured, the condition of the dentures and the individual patient. Creams, powders and strips have different handling characteristics, and no single form is best for every patient. Safety concerns include difficulty removing the material, local irritation and excessive exposure to zinc from zinc-containing products. New formulations with antimicrobial properties are being studied, but laboratory findings need clinical confirmation. Denture adhesives should be considered an additional part of complete denture care after examination of the dentures and supporting tissues. Their use should include clear instructions, daily cleaning and follow-up. Increasing dependence on an adhesive should lead to reassessment of the denture rather than repeated increases in the amount applied.

Keywords: Complete denture; denture adhesives; denture retention; patient satisfaction; oral hygiene

1. Introduction

Retention and stability are important for the successful use of complete dentures. Clinical studies show that denture adhesives can improve resistance to dislodgement, including in well-fitting dentures [6]. Their place in treatment has been discussed for many years, partly because patients may use them both with well-fitting dentures and to manage dentures that need correction. [1,2]

The use of an adhesive should therefore be judged in its clinical setting. A patient who obtains greater confidence from a small amount is different from a patient who repeatedly fills a large gap beneath an unstable denture. The first situation may represent a useful addition to treatment. The second requires examination of the cause of instability. Professional guidance on denture maintenance places adhesive use within continuing care, including cleaning and assessment of the prosthesis.[3]

This review examines the evidence in practical terms: what adhesives can improve, what they cannot correct and how they can be used responsibly.

2. Scope of the Review

This is a narrative review based on targeted online searches undertaken in September 2026. Searches located PubMed-indexed records and accessible journal articles using combinations of “denture adhesives”, “retention”, “masticatory performance”, “patient satisfaction”, “oral moisture”, “zinc” and “biocompatibility”. Clinical trials, evidence reviews, material studies and safety reports were selected for their relevance to complete denture care.

Some publications were assessed through their indexed abstracts, while accessible full texts were consulted where available. No independent duplicate screening, formal risk-of-bias assessment or new statistical analysis was undertaken.

The article should therefore be read as a focused clinical discussion rather than a systematic review.

How Denture Adhesives Work

Denture adhesives act at the contact surface between the denture base and oral tissues. Many formulations contain polymers that absorb water and form a sticky layer. Common ingredients include carboxymethyl cellulose and methyl vinyl ether-maleic acid polymers. Some cream formulations also contain oily components that help control the material's behaviour in moisture.[4]

The resulting layer increases resistance to separation and sliding. Its performance depends on hydration and the properties of the formulation. Laboratory work shows that changes in moisture and other oral conditions can alter adhesion. This helps explain why the same product may perform differently between patients.[4]

An adhesive does not permanently attach a denture to the mouth. It also does not correct the shape of the denture base, border extension or occlusion. Its effect should be considered alongside the mechanical and biological conditions already present.

Available Forms

Denture adhesives are commonly supplied as creams or pastes, powders and strips or pads. Creams allow application to selected areas. Powders can form a thin layer, while strips provide a preformed material. Each form has its own application and removal requirements. [1,2]

Choice should take account of more than initial holding strength. A product that is difficult to apply or remove may be unsuitable for a patient with limited hand movement. Taste, texture and the ability to maintain cleanliness also affect whether the patient will continue using it. These practical concerns deserve discussion when a product is recommended.

Effects on Denture Retention and Stability

Retention is the denture's resistance to being displaced away from the supporting tissues. Stability concerns its resistance to movement during function. Early clinical research by Grasso and colleagues demonstrated improvements in maxillary denture retention and stability with an adhesive.[5] Pradies and colleagues later reported improved retention and stability in patients with well-fitting complete dentures.[6] These findings show that benefit is not restricted to obviously loose dentures.

Indian research has also examined this question. Pachore and colleagues compared three adhesive forms by measuring the retention of maxillary denture bases.[7] Such studies provide useful mechanical evidence, although a force needed to remove a denture base does not fully describe how a patient manages meals, speech or daily wear.

A systematic review by Shu and colleagues included 39 studies and found overall improvements in retention, bite force and masticatory performance.[8] A later network meta-analysis supported benefits of cream and powder adhesives for selected retention and bite-force outcomes, with moderate certainty for those findings.[9]

The response is nevertheless not uniform. In a multicentre trial, Kurogi and colleagues reported improvements in retentive and occlusal forces with a cream adhesive, with the response varying according to treatment difficulty.[10] These results favour an individual trial of use after examination rather than an assumption that every patient will obtain the same benefit.

Chewing Performance

A denture that moves less may allow a patient to bite more confidently. However, greater resistance to displacement and better food breakdown are different outcomes.

This distinction is clear in the multicentre trial reported by Kimoto and colleagues. Chewing performance improved after intervention in the cream, powder and saline control groups, but there was no significant difference between the groups.[11] Improvement from baseline alone therefore did not establish a specific advantage of the adhesive.

Comparisons between adhesive forms are also less conclusive than advertising may suggest. A systematic review found no clear difference between cream and powder for the pooled masticatory performance outcome. Other comparisons were affected by limited studies and differences in methods.[12]

Patients should consequently be given a realistic expectation: an adhesive may help the denture feel more secure, but it may not remove every difficulty with chewing. Persistent difficulty still warrants assessment of the dentures, oral tissues and the patient's functional ability.

Patient Satisfaction and Food Collection

Patient satisfaction is central to complete denture treatment. A change that appears small during force testing may matter greatly to someone worried about denture movement in company.

Torres-Sánchez and colleagues reported improved satisfaction with retention, stability and food-particle accumulation when participants used adhesives.[13] However, a larger multi-centre trial by Ohwada and colleagues found no significant between-group improvement in general satisfaction or oral health-related quality of life over its short intervention period.[14] These findings suggest that improvements in particular functions do not always translate into a broad improvement in the patient's experience.

Food collection beneath a denture is another relevant outcome. Patel and colleagues found that a tested adhesive reduced peanut-particle infiltration and reported denture dislodgements in a controlled chewing model.[15] The finding is useful, but its size should not be assumed to apply to every food, denture or application technique.

A clinical review should therefore ask specific questions. Can the patient finish a meal more comfortably? Does the denture move less during speech? Is cleaning manageable? These questions may reveal a useful benefit even when general satisfaction changes little.

Denture Adhesives and Dry Mouth

Moisture affects the behaviour of denture adhesives, but using an adhesive does not necessarily increase oral moisture.

Nishi and colleagues found no significant change in measured oral moisture after adhesive use. Some functional and satisfaction outcomes improved among participants with oral dryness.[16] Severe oral dryness was excluded, so the findings should not be extended to that group without caution.

An adhesive may therefore assist selected patients with dryness, but it should not be presented as treatment for reduced salivary function. The cause of dryness and any associated soreness require separate assessment.

Safety and Biological Effects

The clearest reported systemic concern relates to excessive use of zinc-containing denture creams. Nations and colleagues described patients with high zinc levels, copper deficiency and neurological abnormalities who had used very large amounts of these products over a prolonged period.[17]

These reports should be interpreted accurately. They concern excessive exposure to zinc-containing formulations; they do not establish that all adhesives, or all patterns of use, carry the same risk. Product composition and the quantity used matter. A history of unusually high consumption should prompt examination of denture fit and consideration of medical assessment where symptoms suggest systemic involvement.

Local safety also requires attention. A recent review described variation in the effects of different formulations on oral cells, inflammation and microbial behaviour.[18] Laboratory toxicity results identify possible concerns but cannot directly establish the frequency of injury in patients.

Persistent burning, redness or discomfort during use should be investigated. The clinician should consider the adhesive alongside mechanical trauma, hygiene, infection and other

possible causes. Simply changing products may leave the actual problem untreated.

Antimicrobial Formulations

Researchers are investigating whether adhesives can provide retention while also reducing microbial activity. A scoping review examined the antimicrobial properties of these materials and the potential value of modified formulations.[19]

Recent laboratory work on adhesives containing surface pre-reacted glass-ionomer filler illustrates both the promise and the difficulty. The formulations reduced the expression of several *Candida albicans* genes associated with harmful behaviour, but increasing filler content also reduced fibroblast viability.[20]

This balance is clinically relevant. A stronger antimicrobial effect is not sufficient if tissue compatibility becomes worse. Clinical studies must establish safe concentrations, patient tolerance and actual effects on denture-related disease before these materials can be recommended for that purpose.

A Practical Approach to Clinical Use

Adhesive advice should begin with examination. The clinician should assess denture fit, stability, occlusion and the supporting tissues. Pain, ulceration or a clear mechanical defect should be addressed before relying on an adhesive.

Where use is appropriate, the patient should receive a demonstration that follows the particular product's instructions. The recommended quantity, removal method and cleaning routine should be explained. Residual material should be removed daily from the dentures and oral tissues, and regular denture review should continue.[3]

Follow-up should assess benefit and burden together. Useful outcomes include comfortable eating, confidence and manageable cleaning. Increasing consumption, repeated reapplication or continuing instability should trigger reassessment.

3. Limitations of the Evidence and Research Needs

The literature measures several different outcomes. Removal force, bite force, food breakdown and satisfaction each describe a different part of denture function. They should not be treated as interchangeable measures of success.

Short intervention periods are another limitation. Several multicentre reports examined outcomes after only four days. [10,11,14,16] Such studies can demonstrate an early response, but they provide limited information about long-term cleaning, continued use and tissue health. Reports from the same research programme should also not automatically be counted as independent groups of patients.

Future studies should compare adhesives using clearly described denture conditions and consistent outcomes. Follow-up should be long enough to assess continued benefit, adverse effects and the effort required for removal. Research should also include patients who need caregiver assistance,

since an effective product may still be difficult to use in daily life.

For Indian clinical practice, useful questions include the continuing cost of use, understanding of instructions and access to denture review. These are proposed research priorities, not findings established by this review. Trials across different care settings could help identify whether gains in retention remain worthwhile when these practical factors are considered.

4. Conclusion

Denture adhesives can improve retention and reduce movement in complete dentures. Benefits for chewing and overall satisfaction are more variable. Selection should depend on the patient's needs, the condition of the dentures and the ability to apply and remove the material correctly. Adhesives are most useful when their effect is reviewed as part of continuing denture care. Persistent problems or increasing dependence should lead to reassessment of the prosthesis.

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