Optimal outcome of complete denture treatment depends on the successful integration of the prosthesis with the patient's oral functions plus psychological acceptance of the dentures by the patient. These parameters require that patients perceive their dentures as stationary or well retained during function, and that the prostheses and their effects on the face meet the esthetic and psychodynamic requirements of the patient. In this chapter, the factors involved in achieving denture retention (the resistance to removal in a direction opposite that of insertion) are reviewed, and the role that a denture adhesive agent may play in the context of the patient's adjustment to, and acceptance of, the dentures is discussed.

FACTORS INVOLVED IN THE RETENTION OF DENTURES

Interfacial force

Interfacial force is the resistance to separation of two parallel surfaces that is imparted by a film of liquid between them. A discussion of interfacial forces is best broken into separate comments on interfacial surface tension and viscous tension.

Interfacial surface tension results from a thin layer of fluid that is present between two parallel planes of rigid material. It is dependent on the ability of the fluid to “wet” the rigid surrounding material. If the surrounding material has low surface tension, as oral mucosa does, fluid will maximize its contact with the material, thereby wetting it readily and spreading out in a thin film. If the material has high surface tension, fluid will minimize its contact with the material, with the result that it will form beads on the material's surface. Most denture base materials have higher surface tension than oral mucosa, but once coated by salivary pellicle they display low surface tension that promotes maximizing the surface area between liquid and base. The thin fluid film between denture base and the mucosa of the basal seat therefore furnishes a retentive force by virtue of the tendency of the fluid to maximize its contact with both surfaces.

Another way to understand the role of surface tension in denture retention is by describing capillary attraction, or capillarity. Capillarity is what causes a liquid to rise in a capillary tube, because in this physical setting the liquid will maximize its contact with the walls of the capillary tube, thereby rising along the tube wall at the interface between liquid and air. When the adaptation of the denture base to the mucosa on which it rests is sufficiently close, the space filled with a thin film of saliva acts like a capillary tube in that the liquid seeks to increase its contact with both the denture and the mucosal surface. In this way, capillarity will help to retain the denture.

Interfacial surface tension may not play as important a role in retaining the mandibular denture as it does for the maxillary one. Interfacial surface tension is dependent on the existence of a liquid/air interface at the terminus of the liquid/solid contact: if the two plates with interposed fluid are immersed in the same fluid, there will be no resistance to pulling them apart. In many patients, there is sufficient saliva to keep the external borders of the mandibular denture awash in saliva,
The retention of complete dentures

achieved through ionic forces between charged salivary glycoproteins and surface epithelium or acrylic resin. By promoting the contact of saliva to both oral tissue and denture base, adhesion works to enhance further the retentive force of interfacial surface tension.

Another version of adhesion is observed between denture bases and the mucous membranes themselves, which is the situation in patients with xerostomia (sparse or absent saliva). The denture base materials seem to stick to the dry mucous membrane of the basal seat and other oral surfaces. Such adhesion is not very effective for retaining dentures, and predisposes to mucosal abrasions and ulcerations due to the lack of salivary lubrication. It is annoying to patients to have denture bases stick to the lips, cheeks, and tongue. An ethanol-free rinse containing aloe or lanolin, or a water-soluble lubricating jelly, can be helpful in this situation. For patients whose mouths are dry due to irradiation or an autoimmune disorder such as Sjögren's syndrome, salivary stimulation through a prescription of 5 to 10 mg of oral pilocarpine three times daily can be very beneficial if the patient can tolerate the likely side effects of increased perspiration and (occasionally) excess lacrimation.

The amount of retention provided by adhesion is proportionate to the area covered by the denture. Mandibular dentures cover less surface area than maxillary prostheses and, therefore, are subject to a lower magnitude of adhesive (and other) retentive forces. Similarly, patients with small jaws or very flat alveolar ridges (small basal seats) cannot expect retention to be as great as can patients with large jaws or prominent alveoli. Thus, the dentures (and hence the impressions that serve as the patient analogue for their fabrication) should be extended to the limits of the health and function of the oral tissues, and efforts should at all times be made to preserve the alveolar height to maximize retention.

In application, interfacial forces are further enhanced through ionic forces developed between the fluid and the surrounding surfaces (adhesion) and the forces holding the fluid molecules to each other (cohesion).

**Adhesion**

Adhesion is the physical attraction of unlike molecules for each other. Adhesion of saliva to the mucous membrane and the denture base is thereby eliminating the effect of interfacial surface tension. This is not so in the maxilla.

Interfacial viscous tension refers to the force holding two parallel plates together that is due to the viscosity of the interposed liquid. Viscous tension is described by Stefan's law.* For two parallel, circular plates of radius \( r \) that are separated by a Newtonian (incompressible) liquid of viscosity \( k \) and thickness \( h \), this principle states that the force \( F \) necessary to pull the plates apart at a velocity \( V \) in a direction perpendicular to the radius will be

\[
F = \frac{(3/2)\pi kr^4}{h^3} V
\]

The relationship expressed by Stefan's law makes it clear that the viscous force increases proportionally to increases in the viscosity of the interposed fluid. The viscous force drops off readily as the distance between the plates (i.e., the thickness of the interposed medium) increases. The force increases proportionally to the square of the area of the opposing surfaces. When applied to denture retention, the equation demonstrates the essential importance of an optimal adaptation between denture and basal seat (a minimal \( h \)), the advantage of maximizing the surface area covered by the denture (a maximum \( r \)), and the theoretical improvement in retention made possible by increasing the viscosity of the medium between the denture and its seat. It also explains why a slow, steady displacing action (small \( V \)) may encounter less resistance and, therefore, be more effective at removing a denture than is a sharp attempt at displacement (large \( V \)).

In application, interfacial forces are further enhanced through ionic forces developed between the fluid and the surrounding surfaces (adhesion) and the forces holding the fluid molecules to each other (cohesion).

**Cohesion**

Cohesion is the physical attraction of like molecules for each other. It is a retentive force because

---

Rehabilitation of the edentulous patient: fabrication of complete dentures

It occurs within the layer of fluid (usually saliva) that is present between the denture base and the mucosa, and works to maintain the integrity of the interposed fluid. Normal saliva is not very cohesive, so that most of the retentive force of the denture-mucosa interface comes from adhesive and interfacial factors unless the interposed saliva is modified (as it can be with the use of denture adhesive).

Thick, high-mucin saliva is more viscous than thin, watery saliva—yet thick secretions usually do not result in increased retention for the following reason. Watery, serous saliva can be interposed in a thinner film than the more cohesive mucin secretions. Stefan's law makes it clear, all other factors being equal, that increase in fluid viscosity cannot be accompanied by an equal increase in film thickness if displacement force is to be kept the same.

Oral and facial musculature

The oral and facial musculature supply supplementary retentive forces, provided (1) the teeth are positioned in the “neutral zone” between the cheeks and tongue and (2) the polished surfaces of the dentures are properly shaped (see Chapter 9). This is not to say that patients must hold their prosthetic teeth in place by conscious effort, only that the shape of the buccal and lingual flanges must make it possible for the musculature to fit automatically against the denture and thereby to reinforce the border seal (Figs. 21-1 and 21-2). One of the objectives in impression making and arch form design is the harnessing of a patient’s unconscious tissue behavior to enhance both retention and stability of the prostheses. If the buccal flanges of the maxillary denture slope up and out from the occlusal surfaces of the teeth and the buccal flanges of the mandibular denture slope down and out from the occlusal plane, the contraction of the buccinators will tend to seat both dentures on their basal seats.

The lingual surfaces of the lingual flanges should slope toward the center of the mouth so the tongue can fit against them and perfect the border seal on the lingual side of the denture. The base of the tongue is guided on top of the lingual flange by the lingual side of the distal end of the flange, which turns laterally toward the ramus. This part of the denture also helps ensure the border seal at the back end of the mandibular denture.

The base of the tongue also may serve as an emergency retentive force for some patients. It rises up at the back and presses against the distal border of the maxillary denture during incision of food by the anterior teeth. This is done without conscious effort when the experienced denture wearer bites into an apple or sandwich or other food. It is seldom that a patient needs to be taught how to do this. For the oral and facial musculature to be most effective in providing retention for complete dentures, the following conditions must be met: (1) the denture bases must be properly extended to cover the maximum area possible, without interfering in the health and function of the structures that surround the denture; (2) the occlusal plane must be at the correct level; and (3) the arch form of the teeth must be in the “neutral zone” between the tongue and the cheeks.

Atmospheric pressure

Atmospheric pressure can act to resist dislodging forces applied to dentures, if the dentures have an effective seal around their borders. This resistance force has been called “suction” because it is a resistance to the removal of dentures from their basal seat; but there is no suction, or negative pressure, except when another force is applied (suction alone applied to the soft tissues of the oral cavity for even a short time would cause serious damage to the health of the soft tissues under negative pressure).

A suction cup pressed against a pane of glass stays in place because the rubber of the squeezed cup elastically seeks to return to a larger shape, thereby causing air pressure within the cup to be less than the pressure outside the cup. A denture cannot be distorted like a suction cup, but oral mucosa can be. When a force is exerted perpendicular to and away from the basal seat of a prop-
Fig. 21-1 Complete dentures have three Surfaces that must harmonize with the oral biological environment. A, The dentures' polished surfaces are so contoured as to support and contact the cheeks, lips, and tongue. B and C, The impression or basal surfaces are fitted to the basal seats. D and E, The occlusal surfaces of one Denture must fit those of the opposing denture.
Fig. 21-2 Frontal section showing dentures properly filling the available space. A, The buccinator. B, The lingual flange and border are placed under the tongue. C, The mylohyoid. Notice that both upper and lower dentures are so shaped that the action of the tongue and cheeks tends to seat rather than unseat them. If posterior artificial teeth are too wide buccolingually, the form of the dentures will be changed and the tongue and cheeks will tend to unseat them.

erly extended and fully seated denture, pressure between the prosthesis and the basal tissues drops below the ambient pressure, resisting displacement.

Retention due to atmospheric pressure is directly proportionate to the area covered by the denture base. For atmospheric pressure to be effective, the denture must have a perfect seal around its entire border. Proper border molding with physiological, selective pressure techniques is essential for taking advantage of this retentive mechanism.

Undercuts, rotational insertion paths, and parallel walls

The resiliency of the mucosa and submucosa overlying basal bone allows for the existence of modest undercuts that can enhance retention. Although exaggerated bony undercuts or less overt ones covered by thin epithelium may compromise denture retention by necessitating extensive internal adjustment of the denture, less severe undercuts of the lateral tuberosities, maxillary premolar areas, distolingual areas, and lingual mandibular midbody areas can be extremely helpful to the retention of the prosthesis.

Some “undercuts” are only undercut in relationship to a linear path of insertion or relative to a presumed vertical path of insertion. But if the undercut area is seated first (usually in a direction that deviates from the vertical), and the remainder of the denture base can be brought into proximity with the basal seat on rotation of the prosthesis around the undercut part that is already seated, this “rotational path” will provide resistance to vertical displacement. One common example of this is to be found in the area inferior to the retromolar pad, into which the distolingual extensions of the mandibular base can be introduced from the superior and posterior prior to rotating the anterior segment of the denture down over the alveolar process. The opposite sequence
is common in the maxilla, where a prominent or even undercut anterior alveolus may dictate an insertion path that begins with seating the anterior in a posterior and superior direction and ends with rotation of the posterior border over the backs of the tuberosities. This concept increases in importance as other retentive mechanisms decline in strength. For instance, in a patient who has undergone loss of normal anatomic contours due to tumor resection or trauma, surgically created relative undercuts may mean the difference between prosthetic success and failure.

Prominent alveolar ridges with parallel buccal and lingual walls may also provide significant retention by increasing the surface area between denture and mucosa and thereby maximizing interfacial and atmospheric forces. Prominent ridges also resist denture movement by limiting the range of displacive force directions possible. Very flat ridges may bear dentures that display strong resistance to displacement perpendicular to the basal seat, due to interfacial and atmospheric forces. Yet these same prostheses are very susceptible to movement parallel to the basal seat, analogous to sliding a suction cup along a pane of glass, or sliding apart two glass pieces separated by intervening fluid.

Gravity

When a person is in an upright posture, gravity acts as a retentive force for the mandibular denture and a displacive force for the maxillary denture. In most cases, the weight of the prosthesis constitutes a gravitational force that is insignificant in comparison with the other forces acting on the denture. But if a maxillary denture is fabricated wholly or partially of a material that increases its weight appreciably (e.g., a metal base or precious metal posterior occlusal surfaces), the weight of the prosthesis may work to unseat it if the other retentive forces are themselves suboptimal. Increasing the weight of a mandibular denture (through the addition of a metallic base, insert, or occlusal surfaces) may seem theoretically capable of taking advantage of gravity. Anecdotal evidence suggests that this may indeed prove beneficial in cases where the other retentive forces and factors are marginal.

ADJUNCTIVE RETENTION THROUGH THE USE OF DENTURE ADHESIVES

Complete denture treatment needs to be customized for each patient’s particular needs. Successful treatment combines exemplary technique, effective patient rapport and education, and familiarity with all possible management options in order to provide the highest degree of patient satisfaction. Commercially available denture adhesives are products that have the capacity to enhance treatment outcome. This reality is compellingly underscored by two facts: (1) consumer surveys reveal that approximately 33% of denture patients purchase and use one or more denture adhesive products in a given year; and (2) denture adhesive sales in the United States exceeded $200 million in 1994 (12% more than for denture cleaners, and nearly twice the spending on dental floss). Dentists need to know about denture adhesives for two reasons: (1) to be able to educate all denture patients about the advantages, disadvantages, and uses of the product, because adhesives are a widely used dental material and patients rightfully expect their dentists to be accurately informed about over-the-counter oral care products and (2) to identify those patients for whom such a product is advisable and/or necessary for a satisfactory denture-wearing experience.

In this chapter, “denture adhesive” is used to refer to a commercially available, nontoxic, soluble material (powder, cream, or liquid) that is applied to the tissue surface of the denture to enhance denture retention, stability, and performance. It does not refer to insoluble patient-directed efforts at improving denture fit and comfort such as home reliner kits, home repair kits, paper or cloth pads, or other self-applied “cushions”—many of which have been anecdotally linked with incidents of serious soft tissue damage, alterations in occlusal relations and vertical dimension of occlusion, and exacerbated alveolar bone destruction. Included in this second category are thin wafers of water-soluble material
Rehabilitation of the edentulous patient: fabrication of complete dentures

that are adherent to both basal tissue and denture base and that lack the ability to flow—and, therefore, do not have the capacity to direct uneven and point pressures against the bearing tissues.

Components and mechanism(s) of action

Denture adhesives augment the same retentive mechanisms already operating when a denture is worn. They enhance retention through optimizing interfacial forces by (1) increasing the adhesive and cohesive properties and viscosity of the medium lying between the denture and its basal seat and (2) eliminating voids between the denture base and its basal seat. Adhesives (or, more accurately, the hydrated material that is formed when an adhesive comes into contact with saliva or water) are agents that stick readily both to the tissue surface of the denture and the mucosal surface of the basal seat. Furthermore, because hydrated adhesives are more cohesive than saliva, physical forces intrinsic to the interposed adhesive medium resist the pull more successfully than would similar forces within saliva. The material increases the viscosity of the saliva with which it mixes, and the hydrated material swells in the presence of saliva/water and flows under pressure. Voids between the denture base and bearing tissues are therefore obliterated.

Denture adhesive materials in use prior to the early 1960s were based on vegetable gums—such as karaya, tragacanth, xanthan, and acacia—that display modest, nonionic adhesion to both denture and mucosa, and possessed very little cohesive strength. Gum-based adhesives (still commercially available) are highly water soluble, particularly in hot liquids such as coffee, tea, and soups, and therefore wash out readily from beneath dentures. Allergic reactions have been reported to karaya (and to the paraben preservative that the vegetable derivatives require), and formulations with karaya impart a marked odor reminiscent of acetic acid. Overall, the adhesive performance of the vegetable gum–based materials is short lived and relatively unsatisfactory.

Synthetic materials presently dominate the denture adhesive market. The most popular and successful products consist of mixtures of the salts of short-acting (carboxymethylcellulose, or CMC) and long-acting (poly[vinyl methyl ether maleate], or “gantrez”) polymers. In the presence of water, CMC hydrates and displays quick-onset ionic adherence to both dentures and mucous epithelium. The original fluid increases its viscosity and CMC increases in volume, thereby eliminating voids between prosthesis and basal seat. These two actions markedly enhance the interfacial forces acting on the denture. Polyvinylpyrrolidone (“povidone”) is another, less commonly used agent that behaves like CMC. Over a more protracted time course than necessary for the onset of hydration of CMC, gantrez salts hydrate and increase adherence and viscosity. The “long-acting” (i.e., less soluble) gantrez salts also display molecular cross-linking, resulting in a measurable increase in cohesive behavior. This effect is significantly more pronounced and longer lived in calcium-zinc gantrez formulations than in calcium-sodium gantrez. Eventually, all the polymers become fully solubilized and washed out by saliva; this elimination is hastened by the presence of hot liquid.

Other components of denture adhesive products impart particular physical attributes to the formulations. Petrolatum, mineral oil, and polyethylene oxide are included in creams to bind the materials and to make their placement easier. Silicone dioxide and calcium stearate are used in powders to minimize clumping. Menthol and peppermint oils are used for flavoring, red dye for color, and sodium borate and methylparaben or polyparaben as preservatives.

Some objective and subjective responses to denture adhesive

With the exception of uncommon allergic reactions to either karaya or paraben, as just mentioned, there have been no reports of tissue reactions to denture adhesive products. For example, prior to 1990, a few of the commercially available denture adhesives contained very low levels of benzene, which is regarded as a carcinogen. These products were recalled by the Food and Drug Administration. Today’s adhesives are either
free of benzene or contain trace amounts believed to be harmless. Commercially available formulations in the United States must pass laboratory animal tests of skin and eye sensitivity and oral toxicity before they are acceptable for sale to the public. Clinical studies of mucosal tissues underlying adhesive-bearing dentures reveal lessened inflammation in patients who perform adequate denture hygiene daily. Dentists must ensure that they are cognizant of any sequelae that may be associated with the prescription of all materials used in routine dental practice.

Incisal bite force exerted by well-fitting dentures overlying well-keratinized ridges with favorable anatomical features (square arch form; broad, prominent alveoli without undercuts; mild or absent frena) is improved significantly with the use of an adhesive. More interestingly, incisal bite force of well-fitting dentures overlying inferior basal tissues (tapering arch form, little or no keratinization, spiny or absent alveolar ridges, frena extending to ridge crests) can be increased to the range of the adhesive-bearing dentures overlying ideal basal tissues. The frequency of dislodgment of dentures during chewing also is markedly decreased with the use of adhesive. Vertical, anteroposterior, and lateral movements (short of full dislodgment) of new and old maxillary dentures retained on their mucosal seats under chewing and speech function can be decreased by 20% to 50% for up to 8 hours after placement of denture adhesive.

Objective comparison of chewing performance fails to show an improvement after use of adhesive, although subjects report increased confidence and security in chewing with the use of denture adhesive. Not all products are the same, and patients can tell them apart; subjects are able to identify preferred adhesive characteristics and products in comparisons of different formulations. Improvement in chewing efficiency during adjustment to new dentures progresses further in patients who employ a denture adhesive product.

Patient response to the use of these materials is not universally positive. Some patients object to the “grainy” or “gritty” texture of powder, or to the taste or sensation of semidissolved adhesive material that escapes from the posterior and other peripheries (often due to use of excessive quantity or use in an inadequate prosthesis). Others object to the difficulties encountered in removing adhesive from the denture and the oral tissues, as well as to the cost of the material.

**Indications and contraindications**

Scientific evidence favoring the support of routine and safe use of adhesives is lacking. Yet clinical experience indicates that prudent use of adhesives to enhance the retentive qualities of well-made complete dentures is sound clinical judgment. Denture adhesives are indicated when well-made complete dentures do not satisfy a patient's perceived retention and stability expectations. Irrespective of the underlying reasons for a patient's reported dissatisfaction—psychological, occupational, morphological, functional, and so on—the dentist must recognize that a patient's judgment of the treatment outcome is what defines prosthodontic success. Such maladaptive patients are clearly candidates for an implant-supported prosthesis (see Section 8). But health, financial, or other considerations can preclude this, and then a well-organized protocol of functional “do's and don'ts” may be the best palliative measure the professional can offer. Specific patient populations who can benefit from this strategy include patients with salivary dysfunction or neurological disorders, and those who have undergone resective surgical or traumatic modifications of the oral cavity.

Patients who suffer from xerostomia due to medication side effects, a history of head and neck irradiation, systemic disease, or disease of the salivary glands have great difficulty managing complete dentures due to impaired retention and an increased tendency for ulceration of the bearing tissues. The use of denture adhesive can compensate for the retention that is lacking in the absence of healthy saliva, and can mitigate the onset of oral ulcerations that result from frequent dislodgments. Xerostomic patients must be educated, however, that the adhesive-bearing denture will
need to be deliberately moistened (e.g., with water from the tap) before it is seated in the otherwise dry mouth to initiate the actions of the material.

Several neurological diseases can complicate the use of complete dentures, but adhesive may help to overcome the impediments imposed. Cerebrovascular accident (stroke) may render part of the oral cavity insensitive to tactile sensation or partially or wholly paralyze oral musculature. Adhesives can assist in helping these patients accommodate to new dentures or to prostheses that were fabricated prior to the stroke but that the patient is now unable to manage due to lost sensory feedback and neuromuscular control. Orofacial dyskinesia is a prominent side effect of phenothiazine-class tranquilizers (e.g., fluphenazine, trifluoperazine, thioridazine or thiothixene), other neuroleptics (e.g., haloperidol), and even gastrointestinal medications (e.g., prochlorperazine, metoclopramide). This movement disorder, sometimes termed “tardive dyskinesia” because it is often a late-onset side effect of dopamine-blocking drugs, is characterized by exaggerated, uncontrollable muscular actions of the tongue, cheeks, lips, and mandible. In such situations, denture retention, stability, and function may be a virtual impossibility without adjunctive retention, such as that made possible with denture adhesive.

Patients who have undergone resective surgery for removal of oral neoplasia, or those who have lost intraoral structures and integrity due to trauma, may have significant difficulty in functioning with a tissue-borne prosthesis unless denture adhesive is employed, even if rotational undercuts have been surgically created to resist displacement of the prosthesis.

*It must be emphasized that a denture adhesive is not indicated for the retention of improperly fabricated or poorly fitting prostheses.*

**Patient education**

It is mandatory that dentists educate denture patients about denture adhesives—their use, abuse, advantages, disadvantages, and available choices. The major information resource for a patient should be the dentist and not magazine and television advertisements or the testimonials of relatives and acquaintances.

The choice between cream and powder is largely subjective, but certain facts may underscore a patient’s selection. Powder formulations, as a rule, do not confer the same degree of “hold,” nor do their effects last as long, in comparison to comparable cream formulations. However powders can be used in smaller quantities, are generally easier to clean out of dentures and off tissues, and are not perceived as “messy” by patients. Furthermore, the initial “hold” for powders is achieved sooner than it is with cream formulations.

Obtaining the greatest advantage from the use of an adhesive product is dependent on its proper usage (Figs. 21-3 to 21-7) For powder and cream products, the least amount of material that is effective should be used. This is approximately 0.5 to 1.5 g per denture unit (more for larger alveolar ridges, less for smaller ones). For powders, the clean prosthesis should be moistened and then a thin, even coating of the adhesive sprayed onto
The retention of complete dentures

Fig. 21-4 The moistened denture surface is then covered with a slightly excess coating of the powder.

Fig. 21-5 When the excess powder is shaken off, a thin, even coat remains.

Fig. 21-6 Prior to applying cream denture formulations, the denture must be cleaned and then thoroughly dried. Most manufacturers recommend the distribution of product as shown. For the mandibular denture, a series of thin beads at the crest of the ridge is recommended. If adhesive is expressed around the periphery of the denture in function, a lesser quantity should be used.

the tissue surface of the denture. The excess is shaken off, and the prosthesis inserted and seated firmly. If the patient suffers from inadequate or absent saliva, the sprayed denture should be moistened lightly with water before being inserted. For creams, two approaches are possible. Most manufacturers recommend placement of thin beads of the adhesive in the depth of the dried denture in the incisor and molar regions, and, in the maxillary unit, an anteroposterior bead along the midpalate. However, more even distribution of the material can be achieved if small spots of cream are placed at 5-mm intervals throughout the fitting surface of the dried denture. Regardless of the pattern selected, the denture is then inserted and seated firmly. As with powders, use of denture adhesive cream by the xerostomia patient requires that the adhesive material be moistened with water prior to inserting the denture.

Patients must be instructed that daily removal of adhesive product from the tissue surfaces of the denture is an essential requirement for the use of the material (Fig. 21-8). Removal is facilitated by letting the prosthesis soak in water or
soaking solution overnight, during which the product will be fully solubilized and can then be readily rinsed off. If soaking is not possible before new adhesive material needs to be placed, removal is facilitated by running hot water over the tissue surface of the denture while scrubbing with a suitable hard-bristle denture brush. Adhesive that is adherent to the alveolar ridges and palate is best removed by rinsing with warm or hot water, and then firmly wiping the area with gauze or a washcloth saturated with hot water.

Finally, patients need to be educated about the limitations of denture adhesive. Discomfort will not be resolved by placing a “cushioning layer” of adhesive under the denture. In fact, pain or soreness signals a need for professional management. Gradual increase in the quantity of adhesive required for acceptable fit of the denture is also a clear signal to seek professional care. In all cases, denture patients need to be recalled annually for oral mucosal evaluation and prosthesis assessment, but they also need to be educated about the warning signs that should alert them to seek professional attention between the checkups.

**Professional attitudes toward denture adhesive**

Denture adhesive products can improve patient acceptance of, and comfort and function with, dentures. They are, however, regarded frequently as unesthetic and an impediment to a dentist’s ability to appraise accurately the health of a patient’s oral tissues and the true character of denture adaptation. The fact that ill-fitting dentures often are retained by large amounts of adhesive material has regrettaingly led many dentists to presume a correlation between denture adhesive and severe alveolar ridge resorption.
If a correlation did indeed exist between denture adhesive use and increased alveolar ridge resorption, it would provide a strong basis for cautioning patients against the use of adhesives. Yet there is no scientific basis for presuming this alleged correlation.

Denture adhesives themselves are not capable of exerting forces that would accelerate resorption. Adhesives are liquid materials that are no more capable of directing forces than is saliva. There is no mechanism through which adhesives can “exert” forces to further accelerate resorption: as fluids, adhesives will transmit occlusal forces evenly to the basal tissues, just as would an intimately fitted acrylic base. If they fail to do so in one or more areas, the patient will experience discomfort and seek professional attention.

Denture adhesives merely reduce the amount of lateral movements that dentures—even well-fitting dentures—undergo while in contact with basal tissues. Admittedly, this benefit can mislead a patient into ignoring his or her need for professional help when dentures actually become ill-fitting. This is an inherent risk when using any form of adjunctive therapy. However, it should not preclude prudent clinical strategies. Denture adhesives are an integral part of a professional service, and their adjunctive benefits must be recognized.

BIBLIOGRAPHY