

Interior Surface Sealant for Acrylic Appliances

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Acrylic orthodontic appliances, when worn for extended periods, tend to accumulate plaque and calculus and thus provide a fertile environment for microorganisms¹⁻⁴ (Fig. 1). Given the well-established relationship between plaque and marginal gingivitis, many investigators have surmised that plaque formation on an acrylic surface is related to mucosal inflammation beneath the appliance.⁵⁻⁷

Studies indicate that the oral environment modifies the adhesive properties of an artificial surface, so that colonization by microorganisms is influenced more by the mechanical surface and irregularities of the acrylic than by its chemical composition.^{8,9} During appliance fabrication, internal porosities develop in the liquid-powder mixture, allowing the monomer to bind to all the polymer beads. These become granular porosities or irregularities on the inner surface of the acrylic, and hence sites for plaque accumulation.¹⁰ Surface irregularities can also be produced by contact between the appliance and the lingual tooth surfaces and palate.

A separating medium is routinely used to ease the removal of the acrylic appliance from the working cast. The medium forms a layer on the underside of the appliance that prevents the liquid monomer from mixing completely. This increases the porosity of the acrylic surface.

We have found a light-cured surface sealant, Palaseal, to be useful in sealing and finishing the inner surfaces of acrylic appliances. This product, which is 45% multifunctional acrylic ester and 50% methyl methacrylate, has been found effective in controlling plaque accumulation.^{11,12} It does not affect the rigidity or coloration of the acrylic, and it reduces the occurrence of mouth odor and of allergic reaction from direct contact with acrylic.

Technique

1. Clean the inner surface of the acrylic appliance with an ultrasonic cleaner, mild pumice, or prophylactic jet to remove any organic pellicle, plaque, calculus, or other surface adhesions. Dry the acrylic surface.
2. Apply denture cleaner to the acrylic to remove any surface contamination. Dry the surface thoroughly.
3. Apply a thin, even coating of Palaseal to the acrylic with a soft brush (Fig. 2). Extend the sealant over the entire inner surface, working in one direction only, but do not make the coating too thick. Let the appliance air-dry for 30 seconds.
4. Light-cure each of the four quadrants of the inner surface for 90 seconds (Fig. 3). A light output of 600mW/cm² (470 nanometers) is recommended.
5. No further finishing is required (Fig. 4). □

FIGURES

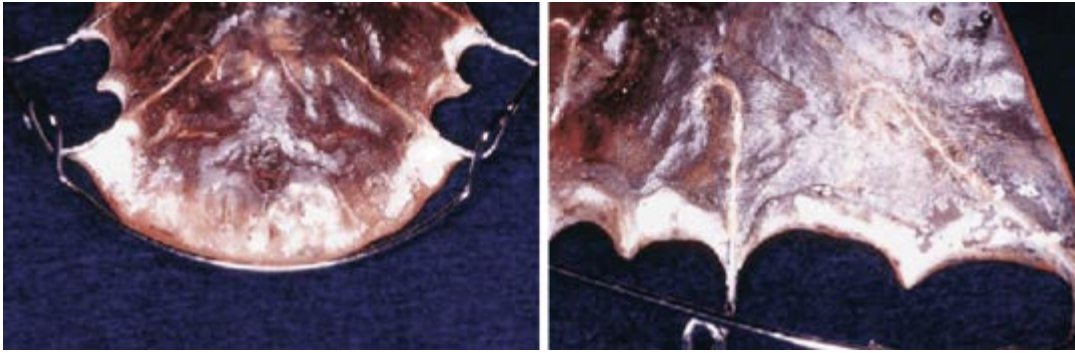


Fig. 1 Plaque and calculus formation on acrylic appliance.

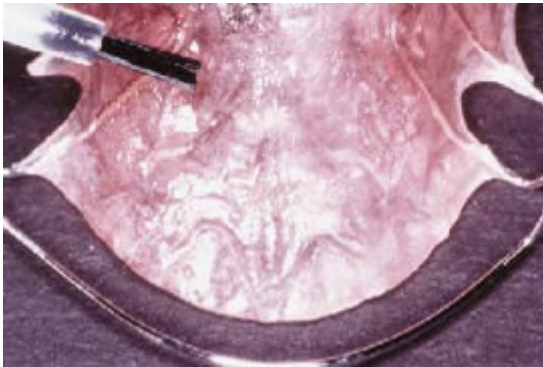


Fig. 2 Thin, even coating of Palaseal applied to inner surface of appliance.



Fig. 3 Palaseal coating light-cured for 90 seconds per quadrant.

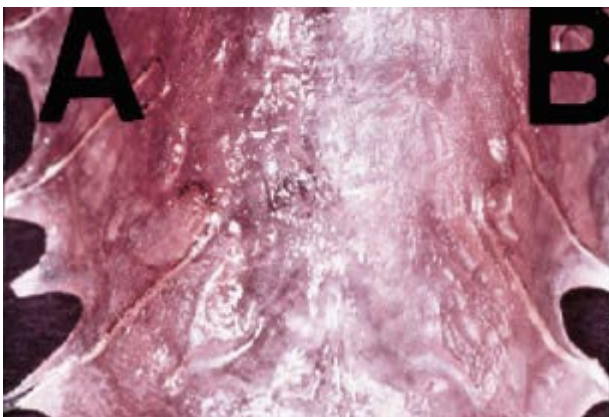


Fig. 4 A. Acrylic coated with Palaseal. B. Untreated acrylic.

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FOOTNOTES

- 1 Heraeus Kulzer, Inc., 4315 S. Lafayette Blvd, South Bend, IN 46614.