

Shear Bond Strength of Two Chemically Different Denture Base Polymers to Reline Materials

Type: Article

Abstract:

Purpose: This study evaluated the shear bond strengths of light-polymerized urethane dimethacrylate (Eclipse) and heat-polymerized polymethylmethacrylate (Meliodent) denture base polymers to intraoral and laboratory-processed reline materials. **Materials and Methods:** Thirty disks measuring 15 mm diameter and 2 mm thick were prepared for each denture base material following the manufacturers' recommendation. They were relined with Meliodent RR, Kooliner, and Secure reline materials after 1 month of water immersion. Ten additional Eclipse specimens were relined using the same Eclipse resin. A shear bond test was carried out on an Instron machine at a crosshead speed of 1.0 mm/min 24 hours after relining. Data were analyzed using two-way and one-way ANOVAs and post hoc Dunnett's T3 test ($p = 0.05$). The nature of failure was analyzed under a stereomicroscope. The effect of dichloromethane adhesive on the two denture polymer surfaces and the failed interfaces of mixed and adhesive failures were analyzed under a SEM (scanning electron microscope). **Results:** Two-way ANOVA showed significant differences in the shear bond strength values as a function of the denture base polymers, reline materials, and their interaction ($p < 0.05$). One-way ANOVA showed significant differences in shear bond strength values among denture base-reline combinations ($p < 0.05$) except for Meliodent-Kooliner and Eclipse-Meliodent RR relines. Meliodent showed the highest shear bond strength value when relined with Meliodent RR (14.5 +/- 0.5 MPa), and Eclipse showed the highest value with Eclipse relining (11.4 +/- 0.6 MPa). Meliodent denture base showed adhesive, cohesive, and mixed failure, while all Eclipse showed adhesive failure with various reline materials. **Conclusion:** The two chemically different denture base polymers showed different shear bond strength values to corresponding reline materials.

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Source	Journal of Prosthodontics-Implant Esthetic and Reconstructive Dentistry
ISSN	1059-941X
DOI	10.1111/j.1532-849X.2009.00481.x
Volume (Issue)	18(7)
Page	596-602
Year	October 2009

Keyword:

Shear bond, urethane dimethacrylate, methyl methacrylate, reline, light, polymerization
Please Cite As:

AHMAD, F. & YUNUS, N. 2009. **Shear Bond Strength of Two Chemically Different Denture Base Polymers to Reline Materials.** *Journal of Prosthodontics-Implant Esthetic and Reconstructive Dentistry*, 18, 596-602.

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