

The effect of mechanical roughening and chemical treatment on shear bond strength of urethane dimethacrylate denture base resin

Type: Article

Abstract:

Relining of ill-fitting denture is often required to establish the fit of denture base, hence better retention and stability of the prostheses. However clinical success depends on the ability of reline resin to bond with denture base. The effect of surface preparations of urethane dimethacrylate (UDMA) denture base resin (Eclipse) on the shear bond strength (SBS) to auto-polymerizing polyethyl methacrylate reline material was evaluated. Eclipse specimens were mechanically prepared using two different tungsten carbide burs and submitted to chemical treatments either with dichloromethane (Secure adhesive) or methyl acetate (Eclipse Bonding Agent). Reline resin was then applied to the prepared surface and shear bond strength was tested after 24 h. Data was analyzed using two-way ANOVA and post-hoc Tukey HSD test at $p=0.05$. The morphological changes of Eclipse surfaces after preparations were also observed under SEM. The results showed that SBS was significantly affected by mechanical roughening, chemical treatment and their interactions. Higher reline SBS values were observed for Eclipse specimens without mechanical roughening compared to those with roughening. Both chemical agents improved reline SBS with the highest bond strength shown when chemically treated using Secure adhesive. For mechanically roughened specimens, Eclipse Bonding Agent (BA) resulted in significantly higher reline bond strength than Secure adhesive. SEM showed different surface appearance of Eclipse resin with various mechanical and chemical preparations.

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