The effects of cavity size and filling method on the bonding to Class I cavities.


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Abstract

PURPOSE: The effects of incremental filling technique and flowable liner on the bond strength of resin composite in different sized cavities were investigated in this study.

MATERIALS AND METHODS: Two sizes of cylindrical Class I cavities were prepared in bovine dentin (98.1 mm³ and 21.2 mm³). A light-curing resin composite (Clearfil Photocore) with a self-etching primer adhesive (Clearfil SE Bond) was used to bulk fill the cavities (C-factor 5), with and without flowable liner (Clearfil FLOW-FX) or incremental filling (2 layers, C-factor 3). As control, a 3-mm or 5-mm buildup was placed on the flat dentin surface (C-factor 0.2). After 24 h storage in 37 degrees C water, the microtensile bond strength was measured at a crosshead speed of 1 mm/min. Mode of failure in the fractured specimens was observed using a scanning electron microscope. The obtained results were statistically analyzed.

RESULTS: In large cavities, incrementally filled and lined cavities showed higher bond strength values than the bulk-filled subgroup (p < 0.05). However, in small cavities, neither the incremental technique nor flowable liner improved the bond strength.

CONCLUSION: Not only the filling techniques but also the cavity size affected the bond strength to the cavity floor in cylindrical Class I cavities.

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