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Comparison of Microleakage in Human and Bovine Substrates Using Confocal Microscopy

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Abstract: Microleakage in human and bovine teeth was compared. Cavities were prepared on the buccal surface in 20 human and 20 bovine teeth (3mm×2mm in depth). The teeth were divided into 4 groups (n=10) according to the substrate and adhesive (CLEARFIL SE Bond-CF or Scotchbond 1-SB1). Resin composite (Wave) was applied in two increments, each cured for 30 sec. Specimens were stored in 100% relative humidity at 37°C for 24 hr and submitted to 1,000 thermal cycles, followed by immersion in 0.6% aqueous rhodamine for 48 hr. Specimens were rinsed and sectioned at the center. Microleakage length was measured and the score recorded using the following scale: 0none, 1-up to enamel junction, 2-up to pulp wall, 3-in pulp wall, 4-beneath pulp wall. Percentage of leakage penetration into the cavity was submitted to an ANOVA and Tukey's test (5%) and the scores submitted to the Kruskal-Wallis and Dunn's multiple comparison tests (5%). When bovine teeth were used, SB1 (87.76%) showed a statistically higher penetration mean than CF (66.22%). When human teeth were used, no difference was found between SB1 (47.35%) and CF (36.01%). When scores were analyzed, SB1 showed no difference to CF. The differences found should be taken into consideration when evaluating adhesive microleakage using bovine teeth.

Key words: Microleakage, Substrates, Human teeth, Bovine teeth

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