

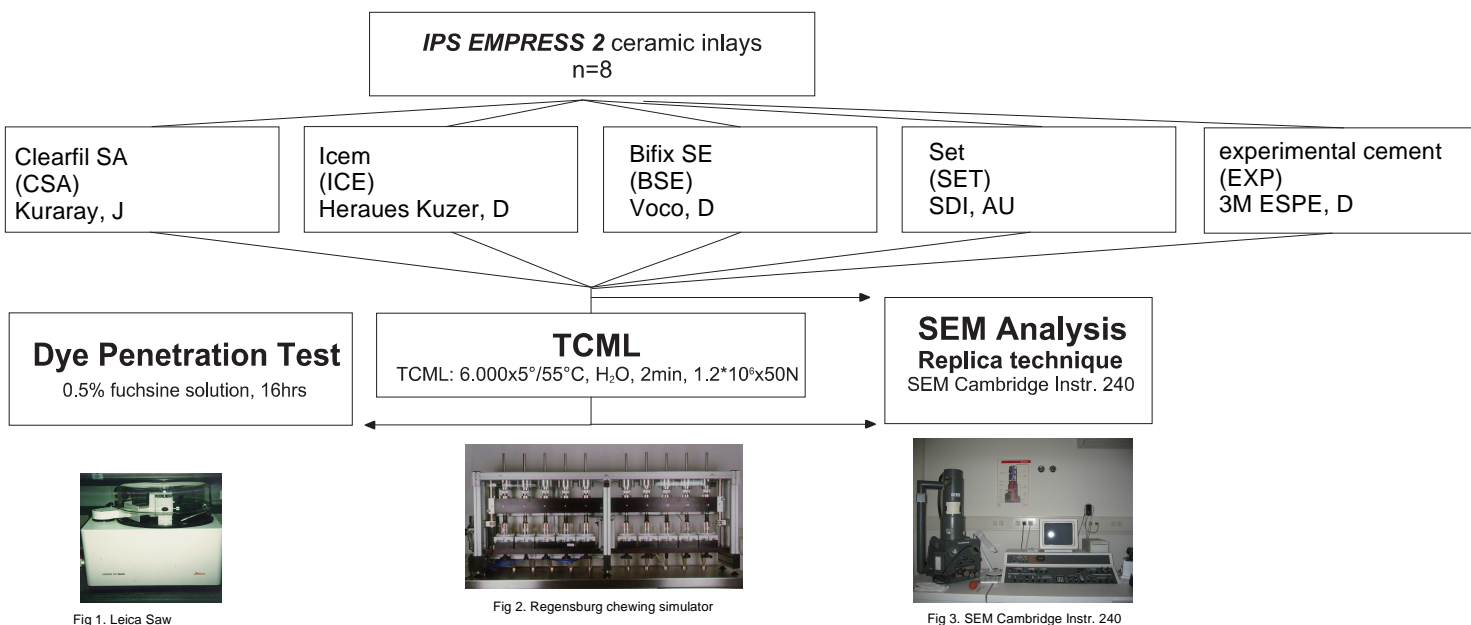
Introduction:

The aim of this study was to investigate the in-vitro marginal adaptation of all-ceramic inlays which were luted with five different self-adhesive resin cements.

Materials and methods:

The marginal integrity of 40 all-ceramic class II (MOD) inlays was determined with scanning electron microscopy (SEM Stereoscan 240, Cambridge Instr., D, magnification up to 800x) and dye penetration tests (0.5% Fuchsin, 16hrs 37°C). The marginal integrity of each tooth was evaluated at dentin and enamel margins at the interface between tooth and cement. The inlays were luted on human molars with four resin-based cements in accordance with the manufactures recommendations in light curing mode.

All tests were performed after 90d storage (water, 37°C) and subsequent thermal cycling with mechanical loading (TCML, 1.2x10⁵x 50N, 6000x5°/55°, 1.6 Hz). Statistics: ANOVA, Tukey test ($\alpha=0.05$).



Results:

Dye penetration values were between 1.6% and 22.1% (dentin margin) and 3.2% and 8.1% (enamel margin). Marginal adaptation (percentage of perfect margin) after aging varied between 83.9+/-8.9% and 95.2+/-4.6% (enamel) and 80.1+/-9.4% and 91.6+/-3.3% (dentin). Only SET showed significantly higher marginal integrity than ICE at the enamel interface. Aging deteriorates the marginal adaptation of ICE at the enamel interface significantly ($p=0.014$).

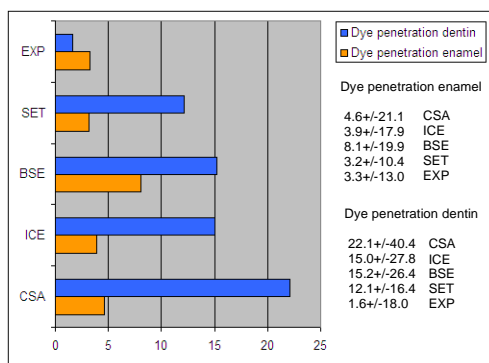


Fig 4. Dye Penetration (%)

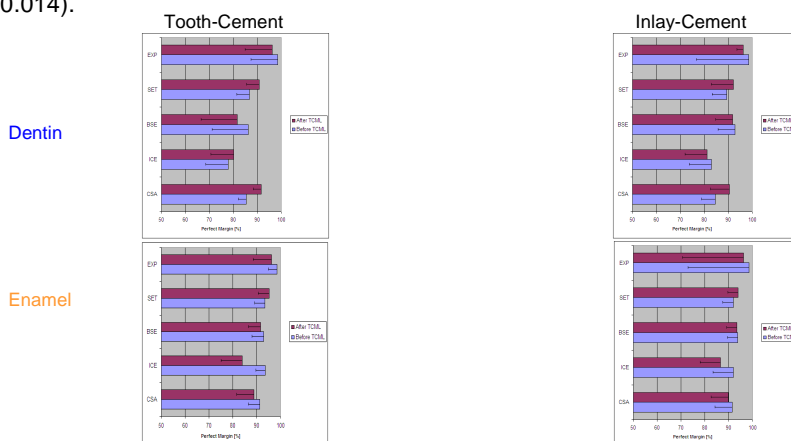


Fig 5. Perfect Margin (%)

Discussion:

The investigated self-adhesive luting cements seem to bond sufficiently to dentin as well as enamel cavities. All cements, with the exception of the experimental material showed higher dye penetration in dentin.