Study on Masking Effect of Various Light-cured Composite Resins

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Abstract: In recent years, dental patients have demanded more esthetic restorations and the MI concept has been widely recognized in the dental industry. Therefore, composite resin restorations are often performed to satisfy these demands. Composite resins are esthetic restorative materials and are semitransparent to reproduce dentin colors. Composite restoration is known to be markedly affected by resin thickness and the color of underlying dentin at the cavity floor.

Experiments were conducted in order to determine the ability of different composite resins to mask the color of stained dentin.

The following four restorative materials were used: Solare (hybrid-type composite resin), EsteliteΣ (SFR composite resin), Clearfil Majesty (hybrid-type composite resin) and Beautiful II using S-PRG filler.

Two shades that are common to all four resins were used: standard shade resin A3 and opaque shade resin A3.

The following four samples were prepared: 1.5-mm standard shade resin; 1.5-mm opaque shade resin; 1.0-mm standard shade resin A3 overlapped with 0.5-mm opaque shade resin A3 (total thickness: 1.5 mm); and 0.5-mm standard shade A3 and 1.0-mm opaque shade resin A3 (total thickness: 1.5 mm). Spectrophotometric colorimetry was performed (background: white board, black board, mat water-based color charts with \(L^*\) values of 75, 65, 55, 45 and 15) to determine XYZ and CIELAB values.

The results showed that with a resin layer thickness of 1.5 mm, an opaque shade resin alone was not sufficient to mask background colors. These results suggest that when treating shallow and severely stained cavities, an opaque shade resin layer should be made as thick as possible to mask background colors. Of the four materials examined in the present study, BE using the S-PRG filler with light-diffusing properties was most effective in masking background colors, thus confirming that it is a suitable material for esthetic restoration of stained cavities.

Key words: Light-cure composite resins, Masking effects, CIELAB