

UTICAJ POLIRANJA NA PROMENU BOJE I SJAJNOSTI KOMPOZITA

POLISHING-DEPENDENT CHANGES IN COLOR AND GLOSS OF COMPOSITES

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Kratka sadržaj

Cilj rada: Analizirani su boja i sjajnost četiri različita kompozita nakon primene različitih metoda finiranja i poliranja.

Metod: Dvadeset uzoraka (dijametar 10 mm, debljina 3 mm) je napravljeno od svakog od sledeća četiri kompozita: microfill (A110), microhybrid (Z250), packable (P60), and nanofill (EXM 612). Svi kompoziti su bili iste boje (A3). Po pet uzoraka od svakog kompozita je imalo sledeći tretman: I) bez ikakvih intervencija/kontrolna grupa (MC); II) poliranje gumicom i sitno granuliranom pastom za poliranje (PCP); III) nahrapavljeno karbidnim borerom, a zatim polirano Soflex diskovima (BS); ili IV) nahrapavljeno i polirano (kao pod III), a zatim polirano gumicom i pastom (BSP). Boja i sjajnost svakog od uzoraka su zatim mereni kolorimetrom i "small-area" glossmetrom. L^* , a^* i b^* koordinate su beležene i izračunavane su ΔE^*_{ab} vrednosti. $\Delta E^*_{ab} = 3.7$ je smatrano lošom usklađenošću boja. Sjajnost je beležena u jedinicama za sjajnost (GU, gloss units). Podaci su analizirani pomoću analize varijanse i Fisherovog PLSD testa sa nivoom značajnosti od 0.05.

Rezultati: Najveća razlika u boji između testiranih kompozita je zabeležena između microfilla i nanofilla, $\Delta E^*_{ab} = 10.4$ (0.1) u MC grupi. Najniža razlika zabeležena je između Z250 i P60 u BS grupi, $\Delta E^*_{ab} = 2.1$ (0.3). Što se tiče različitih tehnika poliranja, 13 od 24 ΔE^*_{ab} vrednosti bilo je = 1.0. Najviša razlika u boji iznosila je 2.9 (0.3) i zabeležena je između MC/P60 i BSP/P60. Najniža ΔE^*_{ab} bila je 0.4 (0.2), između A110/PCP i A110 kod BS. Razlike u sjajnosti između kompozita i između tretmana bile su statistički značajne ($p < 0.0001$, Power 1.00), pri čemu je najveća sjajnost zabeležena za A110 pri MC tretmanu, a najniža za EXM 612 pri BSP.

Zaključci: Razlike u boji između različitih metoda poliranja bile su male i praktično klinički neprimetne. Razlike u boji između kompozita bile su uočljive i u mnogim slučajevima više od vrednosti koja označava lošu usklađenost boja. Površine kompozita polimerizovane kroz providnu matricu imale su najveću sjajnost, bez obzira na tip kompozita. Najveća sjajnost nakon poliranja zabeležena je za mikrofilni kompozit. Niske vrednosti sjajnosti zabeležene su za nanofil nakon PCP i BSP tretmana, a za mikrohibrid nakon BS i BSP tretmana.

Ključne reči: kompozit, poliranje, boja, sjajnost, kolorimetar

Abstract

Purpose: The color and gloss of four different resin composites were evaluated following various steps in finishing and polishing.

Methods: Twenty specimens (10-mm diameter, 3-mm thick) were made from each of four composites: microfill (A110), microhybrid (Z250), packable (P60), and nanofill (EXM 612), all of the same shade (A3). Five specimens of each composite were either: I) untouched/control (MC); II) polished with a rubber prophyl cup and fine grit polishing paste (PCP); III) roughened with a carbide bur, then smoothed with Soflex discs (BS); or IV) roughened and smoothed (as in III), then polished with prophyl cup and paste (BSP). Color and gloss of each specimen was then measured using a colorimeter and a small-area glossmeter, respectively. L^* , a^* , and b^* coordinates were recorded and ΔE^*_{ab} values were calculated. A $\Delta E^*_{ab} = 3.7$ was considered to be a poor match. Gloss was measured in gloss units (GU). Data were analyzed by analysis of variance and Fisher's PLSD at the 0.05 level of significance.

Results: The color difference among the composites tested was greatest between the microfill and the nanofill composite, $\Delta E^*_{ab} = 10.4$ (0.1) in the MC group. The lowest recorded ΔE^*_{ab} was 2.1 (0.3), for comparison between Z250 and P60 of the BS group. When polishing techniques were compared, 13 of the 24 ΔE^*_{ab} values calculated were = 1.0. The highest recorded color difference was 2.9 (0.3), between MC/P60 and BSP/P60. The lowest value of ΔE^*_{ab} was 0.4 (0.2) between A110/PCP and A110/BS. Gloss differences were significant both among composites and among treatments ($p < 0.0001$, power 1.00), with A110/MC having the highest gloss values and the EXM 612/BSP having the lowest.

Conclusions: The color differences among polishing methods were small and unlikely to be detectable clinically. The color differences among composites were detectable and, in many cases, above the value that indicated a poor match. A composite surface cured against Mylar had the highest gloss value, regardless of the composite type. The highest gloss values after polishing were recorded for the microfill. Low gloss values were obtained for the nanofill after prophylaxis-type polishing and for the microhybrid after treatments with both bur and Soflex discs as well as bur and Soflex discs followed by prophylaxis.

Key words: resin, polish, color, gloss, colorimeter