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Tooth Color on Treated Versus Untreated Arches

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Objectives: This research evaluated tooth whitening on the treated maxillary teeth and untreated mandibular teeth to assess the feasibility of split arch study model. **Methods:** Twenty healthy adults with no history of vital bleaching were assigned twice daily use of 6% hydrogen peroxide whitening strips over 14-days, while the mandibular arch remained untreated. Digital images of the anterior teeth were collected at baseline, intermediate Day 8, and end-of-treatment Day 15 using a high resolution digital camera and fixed lighting conditions. From each image, L*a*b* color was determined separately for the maxillary and mandibular anterior teeth using calibration standards. A repeated measures model was used to compare arches, and intra-class correlations (ICC) and 95% confidence intervals (95% CI) were derived for tooth color on the untreated lower teeth. **Results:** The study population ranged from 19-59 years of age. On the treated maxillary arch, mean (SE) Δb* yellowness was –1.3 (0.15) at Day 8 and –2.2 (0.24) at Day 15, differing significantly ($p < 0.0001$) from baseline and the untreated mandibular arch at each timepoint. The untreated mandibular arch showed no significant ($p > 0.53$) color change, with mean (SE) Δb* of –0.0 (0.07) and 0.1 (0.11) at Day 8 or Day 15. Outcomes were similar for ΔL* brightness. On the untreated mandibular arch, the overall between visit ICC (3 visits) was 0.973 for b* and 0.968 for L*. 95% CI lower bounds for the between visit ICC of b* and L* ranged from 0.942-0.951. **Conclusion: The absence of color change on the untreated arch, combined with consistent digital image measurement over time, suggests the viability of a split arch model using untreated mandibular teeth as an experimental control in tooth whitening trials.**