Effect of Ozone on Enamel and Dentin Bond Strength
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Abstract
Purpose:
To evaluate the influence of direct high-dose gaseous ozone application (2100 ppm) on dentin and enamel shear bond strength.

Materials and Methods:
Ten bovine enamel and dentin samples per group were pretreated as follows: (I) ozone application (Healozone, KaVo) for 60 s alone or (II) with subsequent application of a fluoride- and xylitol-containing antioxidant (liquid reductant), (III) light-activated bleaching with 35% hydrogen peroxide for 5 min serving as negative control (Hi-Lite, Shofu), and (IV) untreated enamel and dentin (positive control). Specimens were bonded with a functional 3-step adhesive system (Syntac Classic, Ivoclar Vivadent) and restored with a composite (Tetric Ceram, Ivoclar Vivadent) according to the Ultradent method. After storage in water at 37°C for 24 h, shear bond strength was measured using a Zwick universal testing machine. Data were analyzed using ANOVA and Scheffe's post hoc analysis.

Results:
In concordance with the existing literature, bleaching resulted in significantly decreased bond strength (p < 0.05) on enamel specimens. No decrease in shear bond strength was detected for ozone-pretreated specimens compared to untreated controls.

Conclusion:
Despite a possible retention of surface and subsurface oxide-related substances during high-dose ozone application, shear bond strength was not impaired. Thus, adhesive restoration placement should be possible immediately after ozone application for cavity disinfection.

Key words: dental material, ozone, enamel, dentin, shear bond strength, in vitro.