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### Effect of pulsed-power plasma on the adhesion of resin composite to dentin

This study investigated the effect of pulsed-power plasma on the adhesion of resin composite to dentin and its durability. A pencil type helium plasma jet was used with pulsed power of 1.2 W at 400 Hz. Dentin adhesion and its durability were compared using a micro-tensile bond strength (MTBS) test before and after 10,000 cycles of thermo-cycling (TC), according to the following surface treatments after etching and rinsing: air dry with no plasma (AD); pulsed plasma dry with a pulsed power of 1.2 W (PP); re-wetted after pulsed plasma dry (RW); with wet-bonding (WB). Then, Single Bond 2 and Z-250 resin composite (3M ESPE) were applied according to the manufacturer's instructions. Data were analyzed with repeated-measures ANOVA and *post hoc* Scheffe test ( $\alpha=0.05$ ). The MTBS of AD, PP, RW and WB groups at 24 h were 28.9 (9.5)<sup>ab</sup>, 61.2 (14.3)<sup>d</sup>, 58.6 (14.6)<sup>cd</sup> and 52.2 (16.8)<sup>cd</sup> respectively. They were 16.3 (5.8)<sup>a</sup>, 44.9 (14.3)<sup>bc</sup>, 57.3 (18.4)<sup>cd</sup> and 66.9 (13.6)<sup>d</sup> after TC, respectively. Within the limitation of this study using a total-etch 2-step adhesive, when the dentin surface was dried with pulsed plasma spray after etching and rinsing, the MTBS was similar to that obtained with wet bonding technique. After TC, although the MTBS obtained with pulsed plasma dry decreased significantly, that obtained with rewetting did not decrease. Although pulsed plasma treatment using low applied energy improved the dentin adhesion, the plasma treated surface need to be rewetted for durability.

### Biography

Byeong-Hoon Cho has completed his DDS from Seoul National University Dental College in 1984 and PhD from Seoul National University in 1993. He is a Professor of the Department of Conservative Dentistry, Seoul National University School of Dentistry and the Director of Dental Life Science Research Institute of Seoul National University Dental Hospital. He has published more than 105 papers in reputed journals and is serving as the Editor-in-Chief of the Restorative Dentistry & Endodontics.

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