

## BOND STRENGTH OF CONTEMPORARY BONDING SYSTEMS TO CORONAL AND RADICULAR DENTINE

Mostafa A M Hassan\* and Enas H Mobarak\*\*

### **Abstract:**

**Purpose:** This study was to examine the bond strength of a resin composite restorative material to coronal and radicular dentine treated with two "all-in-one" bonding systems [Prompt-L-Pop (PL); iBond (IB)]; in comparison to two and three steps bonding systems [Single Bond (SB); Scotchbond Multipurpose Plus (SBMP<sup>+</sup>)]. SEM was used to examine the tooth-restoration interface (hybrid layers and resin tags).

**Methods:** Sixty human mandibular premolars were selected for this study. The proximal surface of each mounted tooth was ground flat exposing underline dentine. The prepared teeth were randomly assigned into the proposed four groups (10 teeth each). Each evaluated BS was applied on the coronal and radicular dentine for each test sample then the composite was applied using a split molds with two close circular holes (H=2mm & Ø=2.5mm). Samples were tested in shear in Instron at a cross-head 0.5mm/min. After that, the mode of failure was identified. For each group, five representative samples were prepared for SEM.

**Results:** In general, the SBS values of all tested groups to coronal dentine were higher than the corresponding radicular ones except with PL. ANOVA test revealed statistically significant difference ( $P=0.0001$ ). T-test revealed a statistically significant difference within only the SB group ( $p=0.05$ ). Predominating adhesive failure mode for all tested groups was recorded except for IB group to radicular dentine.

**Conclusions:** "All-in-one" bonding systems have compromised bonding potentials not only to coronal but also to radicular dentine. Moreover; there is no correlation between the resin tags infiltration or hybrid layer thickness, and the SBS values.

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\* Assistant Professor of Restorative Dentistry, Faculty of Oral and Dental Medicine, Cairo University

\*\* Lecturer of Restorative Dentistry, Faculty of Oral and Dental Medicine, Cairo University