

Push-Out Bond Strength of Two Root-End Filling Materials in Root-End Cavities Prepared by Er,Cr: YSGG Laser or Ultrasonic Technique

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Abstract : This study compared the push-out bond strength of mineral trioxide aggregate (MTA) and a new endodontic cement (NEC) as root-end filling materials in root-end cavities prepared by ultrasonic technique (US) or Er,Cr:YSGG laser (L). Eighty single-rooted extracted human teeth were endodontically treated, apicectomised and randomly divided into four following groups (n = 20): US/MTA, US/NEC, L/MTA and L/NEC. In US/MTA and US/NEC groups, rooted cavities were prepared with ultrasonic retrotip and filled with MTA and NEC, respectively. In L/MTA and L/NEC groups, root-end cavities were prepared using Er, Cr:YSGG laser and filled with MTA and NEC, respectively. Each root was cut apically to create a 2 mm-thick root slice for measurement of bond strength using a universal testing machine. Then, all slices were examined to determine the mode of bond failure. Data were analysed using two-way ANOVA. Root-end filling materials showed significantly higher bond strength in root-end cavities prepared using the ultrasonic technique (US/MTA and US/NEC) ($P < 0.001$). The bond strengths of MTA and NEC did not differ significantly. The failure modes were mainly adhesive for MTA, but cohesive for NEC. In conclusion, bond strengths of MTA and NEC to root-end cavities were comparable and higher in ultrasonically prepared cavities.

Keywords : bond strength, Er,Cr:YSGG laser, MTA, NEC, root-end cavity

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