

Fracture resistance of endodontically-treated teeth restored using three root-reinforcement methods

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Abstract

Aim: The aim of this in vitro study was to compare the fracture resistance of endodontically-treated anterior teeth with their roots reinforced using three different restorative methods. **Methods and Materials:** Forty sound maxillary human central incisors were randomly assigned to four groups (n=10). The crowns of the teeth were removed at a level 1 mm incisal to the cemento-enamel junction (CEJ). After root canal therapy, flared canals were simulated in three groups. In the first, second, and third groups the flared canals were reinforced with resin composite (RCO) (Clearfil DC Core Automix), two Reforpins (REF), and a resin cement (RCE) (Panavia F 2.0), respectively. In the fourth (DEN) group flared canals were not created. The same size fiber reinforced composite (FRC) posts were cemented with resin cement (Panavia F 2.0) in all groups. After post cementation and restoration of the teeth crown with a core build-up composite (Clearfil Photo Core), the roots of the teeth were embedded in acrylic resin blocks up to 1 mm below the CEJ. The samples were loaded in an Instron testing machine with a crosshead speed of 0.5 mm/min at a 45° angle to the long axis of the tooth on the palatal surfaces until failure occurred. Data were analyzed using the Kruskal-Wallis, Mann-Whitney, and Chi-square tests (p=0.05). **Results:** Significant differences were found between fracture resistance in all of the groups (P<0.05) with the exception being among the RCO and REF groups. The least mean value 220 (130) N and the highest mean value 820 (220) N were shown in the fracture resistance of the RCE and DEN groups, respectively. **Conclusion:** Reforpin can be used as an alternative to resin composite for internal reinforcement of weakened roots according to the results of this study. For reinforcement of flared canals, fiber posts along with Reforpin or resin composite proved to have higher fracture resistance than resin cement. Non flared canals had the highest fracture resistance.

Reaxys Database Information

Author keywords

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