

THE EFFECT OF GLASS FIBRE POST DIAMETER ON THE
FRACTURE RESISTANCE OF ENDODONTICALLY
TREATED TEETH

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ABSTRACT

Objectives: To determine the effect of glass fibre-reinforced composite (FRC) posts of different diameters on the failure load of endodontically treated teeth with different remaining dentine and reinforcing resin composite (RRC) thicknesses and the mode of failure in each group.

Methods: Fifty extracted intact human maxillary central incisors were decoronated 2 mm incisal to buccal CEJ and endodontically treated. The teeth were randomly assigned to one of the five groups (n=10): Group B (Blue), post space prepared with size 0 post drill (Ivoclar Vivadent, Liechtenstein)/size 0 FRC post/no RRC; Group W(White), size 1 post space/size 1 FRC post/no RRC; Group R(Red), size 3 post space/size 3 FRC post/no RRC; Group WR, size 3 post space/size 1 FRC post/RRC; Group BR, size 3 post space/size 0 FRC post/RRC. Ferrule of 2 mm and 0.5 mm were prepared at facio-lingual and proximal margins respectively. All specimens were restored with Ni-Cr crowns, thermocycled and loaded at 135° from the long axis in a universal testing machine at a crosshead speed of 0.5 mm/min until fracture. Data were analyzed using One-way ANOVA followed by post-hoc comparisons (Bonferroni) with $\alpha=0.05$.

Results: Mean failure loads (N) for Groups B, W, R, WR and BR were: 1406.05(SD=376.14), 1258.76(379.35), 1084.54 (528.37), 958.79 (199.87) and 815.91(298.31). Significant differences were found between Group B and BR. Group B has the highest favourable failure mode.

Conclusion: Within the limitations of this study, the remaining dentine is the most important factor in fracture resistance of endodontically treated teeth and produces the most favourable fracture if failure occurs (Group B). Therefore, the use of smaller FRC post and RRC is recommended rather than enlargement of post spaces to fit accurately larger FRC posts as the enlargement of post spaces increases the risk of unfavourable failure.

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