EFFECT OF FERRULE HEIGHT AND GLASS FIBRE POST LENGTH ON FRACTURE RESISTANCE OF ENDODONTICALLY TREATED TEETH

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ABSTRACT

Objectives: 1. To evaluate the effect of ferrule height (FH) and post length (PL) on fracture resistance of endodontically treated teeth (ETT) restored with glass fibre post, composite resin core and crown. 2. To assess the effect of FH and PL on the failure mode of these teeth.

Methods: Ninety endodontically treated maxillary central incisors were randomly divided into three groups of 30 according to their FH: 4, 2 and 0 mm. Post space was prepared according 2/3, 1/2 and 1/3 of the root length (N = 10 each). RelyX™ fibre posts (3M/ESPE, USA) were then cemented with self adhesive resin cement (RelyX™ Unicem, 3M/ESPE, USA). Core build-ups were done using composite resin (Filtek™ Z350, 3M/ESPE, USA). Cast metal crowns were cemented on the prepared specimens using RelyX Unicem. The specimens were thermocycled and compressive static load was applied at an angle of 135 degrees to the crown. The load (N) at failure and mode of failure were recorded. Statistical analysis was performed with Two-way ANOVA.

Results: No significant interaction between ferrule heights and post lengths was observed ($p = 0.801$). Significant difference in the failure load was found in the ferrule height groups ($p < 0.001$) but not in the post length groups ($p = 0.102$). 4 mm ferrule group had significantly higher failure load (FL) (536.7 N ± 195.4) compared to 2 mm (414.6 N ± 133) and 0 mm ferrule groups (319.8 N ± 54.7) ($p = 0.018$, $p < 0.001$). 2 mm ferrule group had significantly higher FL than 0 mm ferrule group ($p = 0.002$). More favourable failure modes were observed in almost all subgroups.

Conclusion: Increasing the FH significantly increased the fracture resistance of ETT restored with glass fibre post, composite resin core and a crown. Post length had no significant effect on the fracture resistance. Most groups had favourable failure mode.

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ORIGINAL LITERARY WORK DECLARATION

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Name of Degree: Master of Dental Sciences

Title of Project Paper/Research Report/Dissertation/Thesis ("this Work"):

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Field of Study: Conservative Dentistry

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