

Comparison of in vitro fracture strength of metallic and tooth-coloured posts and cores.

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In root-treated anterior teeth a better aesthetic can be achieved by using translucent and tooth-coloured post and core restorations instead of traditional metal post systems. The aim of this in vitro study was to compare the fracture strength of tooth-coloured ceramic and fibre-reinforced posts as well as titanium posts with clinically proven gold alloy posts as a control. Two all-ceramic, one gold alloy and three combined post restoration systems (titanium and ceramic, respectively, fibre-reinforced posts with composite core) were each applied to upper incisors and after thermal cycling and mechanical loading (TCML) the fracture strength was determined. The variant providing the most reliable fracture strength values and the experimental fibre-reinforced composite (FRC) posts were - in combination with adhesively luted crowns - used to determine the fracture strength of the restoration after thermal cycling and mechanical loading. The median fracture strength of the luted posts and cores fluctuated between 114 and 546 N. Posts with composite cores demonstrate a higher fracture strength in comparison to the all-ceramic and gold alloy systems. Typical failure of metal systems was marked by loosening of the bonding and pulling out of the post in contrast to fracture of the ceramic posts. After the application of the crowns the ceramic system with composite core provided a fracture strength of 338 N and the FRC system a fracture strength of 228 N. Regarding fracture strength, the ceramic posts with composite cores are an alternative to commonly used gold posts and cores. A standardized technical manufacture of FRC posts and cores would provide better fracture strength results of this new dental material. Post and core restorations with tooth-coloured, translucent material offer an improved aesthetic especially in anterior restorations. Because of the high fracture strength prefabricated ceramic posts in combination with composite cores should prove their clinical applicability.

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