

In vitro fracture resistance and marginal adaptation of metallic and tooth-coloured post systems.

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The aim of this in vitro study was to compare the fracture resistance and marginal adaptation of all-ceramic incisor crowns with all-ceramic posts, glass-fibre-reinforced posts and titanium posts as well as a control without any post. Three groups of eight maxillary incisors were restored with an all-ceramic post, a fibre-reinforced composite (FRC) post, a titanium post and a further group was restored without posts. Composite cores were provided and all-ceramic crowns were adhesively luted. After artificial ageing, the fracture resistance of the restored teeth was determined. The marginal adaptation of the restorations at the interfaces between cement-tooth and cement-crown was evaluated with scanning electron microscopy using replica specimen before and after ageing. The restored teeth without posts [270N (235/335)] showed no significantly different fracture strength compared with teeth with the titanium system [340N (310/445)]. The all-ceramic posts [580N (425/820)] and the FRC posts [505N (500/610)] both provided a significant higher fracture resistance than the teeth without posts. Prior to ageing, all materials showed <5% separation at the margins cement-tooth or cement-crown ('marginal gap'). After ageing, the interfaces of all systems deteriorated to values between 6 and 14% marginal gap. The greatest marginal gap was found with the titanium system (14%) at the interface cement-crown and with the all-ceramic posts (12%) at the transition between cement-tooth. Regarding fracture resistance and the marginal adaptation, the all-ceramic and FRC posts may be considered as an alternative to the commonly used titanium post restorations.

PMID: 15210029 [PubMed - indexed for MEDLINE]