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The influence of different cements on the fracture resistance and marginal adaptation of all-ceramic and fiber-reinforced crowns.

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PURPOSE: This in vitro study investigated the marginal adaptation and fracture resistance of heat-pressed glass-ceramic and fiber-reinforced composite molar crowns luted with resin, resin-modified glass-ionomer, or zinc-oxide-eugenol-free cements. MATERIALS AND METHODS: A total of 24 heat-pressed all-ceramic and 24 glass fiber-reinforced composite crowns were constructed and cemented using the above-mentioned luting agents (eight crowns per cement). The restorations were thermocycled and mechanically stressed, and fracture resistance was determined. Marginal adaptation was evaluated before and after stress application using semiquantitative analysis in a scanning electron microscope. RESULTS: All-ceramic and fiber-reinforced composite crowns reached the highest fracture resistance after stress application in combination with the resin cement. When luted with resin-modified glass-ionomer or zinc-oxide-eugenol-free cements, the fracture resistance of all-ceramics decreased significantly, while the fiber-reinforced composite crowns maintained their fracture resistance level; the lowest values were found for zinc-oxide-eugenol-free cements. The marginal adaptation remained unchanged after stress for all-ceramics and fiber-reinforced composite restorations if they were luted with resin cements. Luting with resin-modified glass-ionomers significantly deteriorated the marginal adaptation after stress application, with the exception of the crown-cement interface of all-ceramics. CONCLUSION: The highest fracture resistance and marginal adaptation were found for all-ceramic and glass fiber-reinforced composite molar crowns if they were luted with resin cement.

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